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**DEPARTMENT OF LABOR**

**Occupational Safety and Health Administration**

**29 CFR Parts 1910, 1915, 1917, 1918, 1926, 1928**

**[Docket No. OSHA-2020-0004]**

**RIN 1218-AD36**

**Occupational Exposure to COVID-19; Emergency Temporary Standard**

**AGENCY:** Occupational Safety and Health Administration (OSHA), Department of Labor

**ACTION:** Interim final rule.

**SUMMARY:** The Occupational Safety and Health Administration (OSHA) is issuing an emergency temporary standard (ETS) to protect workers from occupational exposure to COVID-19. During the period of the emergency standard, employers must develop and implement a COVID-19 plan to identify and control COVID-19 hazards in the workplace. Employers must also implement various requirements to reduce transmission of COVID-19 in their workplaces, including: physical distancing of at least six feet, when feasible; physical barriers; personal protective equipment (PPE), including face coverings, facemasks, and respirators; a visitor/non-employee face covering policy; cleaning and disinfection; ventilation; health screening and medical management; training; anti-retaliation; recordkeeping; and reporting. Employers in healthcare and associated industries must also implement patient screening and management requirements, Standard and Transmission-Based Precautions, and controls for aerosol-generating procedures.

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**DATES:** The rule is effective [INSERT DATE OF PUBLICATION IN THE FEDERAL REGISTER]. The incorporation by reference of certain publications listed in the rule is approved by the Director of the Federal Register as of March XX 2021. Compliance dates for specific provisions are in 29 CFR 1910.501(p) for the general section, 29 CFR 1910.502(s) for the healthcare and associated industries section, and 29 CFR 1910.504(e) for the mini respiratory protection program section.

Written comments, including comments on any aspect of this ETS and whether this ETS should become a final rule, must be submitted by [INSERT DATE 30 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER].

**ADDRESSES:** In accordance with 28 U.S.C. 2112(a), the Agency designates Edmund C. Baird, Associate Solicitor of Labor for Occupational Safety and Health, Office of the Solicitor, U.S. Department of Labor, to receive petitions for review of the ETS. Service can be accomplished by email to zzSOL-Covid19-ETS@dol.gov.

*Written comments*. You may submit comments and attachments, identified by Docket No. OSHA-2020-0004, electronically at *www.regulations.gov*, which is the Federal e-Rulemaking Portal. Follow the online instructions for making electronic submissions.

*Instructions:* All submissions must include the agency's name and the docket number for this rulemaking (Docket No. OSHA-2020-0004). All comments, including any personal information you provide, are placed in the public docket without change and may be made available online at *www.regulations.gov.* Therefore, OSHA cautions commenters about submitting information they do not want made available to the public, or submitting materials that contain personal information (either about themselves or others), such as Social Security Numbers and birthdates.

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*Docket:* To read or download comments or other material in the docket, go to Docket No. OSHA-2020-0004 at *www.regulations.gov*. All comments and submissions are listed in the *www.regulations.gov* index; however, some information (*e.g.,* copyrighted material) is not publicly available to read or download through that website. All comments and submissions, including copyrighted material, are available for inspection through the OSHA Docket Office.[1] Contact the OSHA Docket Office at 202–693–2350 (TTY number: 877–889–5627) for assistance in locating docket submissions.

**FOR FURTHER INFORMATION CONTACT:**

*General information and press inquiries*: Contact Frank Meilinger, Director, Office of Communications, U.S. Department of Labor; telephone (202) 693-1999; email *meilinger.francis2@dol.gov*.

*For technical inquiries:* Contact Andrew Levinson, Directorate of Standards and Guidance, U.S. Department of Labor; telephone (202) 693-1950.

**SUPPLEMENTARY INFORMATION:** The preamble to the ETS on occupational exposure to COVID-19 follows this outline:

**Table of Contents**

I. Executive Summary
II. History of COVID-19
III. Pertinent Legal Authority
IV. Rationale for the ETS
    A. Grave Danger
    B. Need for the ETS
V. Need for Specific Provisions of the ETS
VI. Feasibility
    A. Technological Feasibility

[1] Documents submitted to the docket by OSHA or stakeholders are assigned document identification numbers (Document ID) for easy identification and retrieval. The full Document ID is the docket number plus a unique four-digit code. OSHA is identifying supporting information in this ETS by author name and publication year, when appropriate. This information can be used to search for a supporting document in the docket at *http://www.regulations.gov*.

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B. Economic Feasibility
VII. Additional Requirements
VIII. Summary and Explanation of the ETS
IX. Authority and Signature

**I. Executive Summary**

This ETS is based on the requirements of the Occupational Safety and Health Act (OSH Act or Act) and legal precedent arising under the Act. Under section 6(c)(1) of the OSH Act, 29 U.S.C. 655(c)(1), OSHA shall issue an ETS if the agency determines that employees are exposed to grave danger from exposure to substances or agents determined to be toxic or physically harmful or from new hazards, and an ETS is necessary to protect employees from such danger. These legal requirements are more fully discussed in *Pertinent Legal Authority* (Section III of this preamble).

For the first time in its 50-year history, OSHA faces a new hazard so grave that it has killed more than half a million people in the United States in barely over a year, and sickened millions more. OSHA has determined that employee exposure to this new hazard, SARS-CoV-2 (the virus that causes COVID-19) presents a grave danger in every shared workplace in the United States. This finding of grave danger is based on the science of how the virus spreads as well as the adverse health effects suffered by those diagnosed with COVID-19, as discussed in *Grave Danger* (Section IV.A. of this preamble).

OSHA has also determined that an ETS is necessary to protect employees from exposures to SARS-CoV-2, as discussed in *Need for the ETS* (Section IV.B. of this preamble). Through its enforcement efforts to date, OSHA has encountered significant obstacles, revealing that existing standards, regulations, and the OSH Act's General Duty Clause are wholly inadequate to address the COVID-19 hazard. The agency has determined that a COVID-19 ETS is necessary to address these inadequacies. Additionally, as states and localities have taken increasingly more divergent

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approaches to COVID-19 workplace regulation—ranging from states with their own COVID-19 ETSs to states with no workplace protections at all—it has become clear that a Federal standard is needed to ensure sufficient protection for employees in all states. OSHA recognizes the promise of vaccines to protect workers, but as of the time of the promulgation of the ETS, vaccination has not eliminated the grave danger presented by the SARS-CoV-2 virus. As more of the workforce becomes vaccinated and the post-vaccine evidence base continues to grow, OSHA may terminate, or modify the ETS or pause the enforcement of the ETS to the extent the workplace hazard is substantially diminished.

The agency has also evaluated the feasibility of this ETS and has determined that the requirements of the ETS are both economically and technologically feasible, as outlined in *Feasibility* (Section VI of this preamble).

As discussed in the *Need for Specific Provisions* (Section V of this preamble), OSHA based its decisions concerning appropriate provisions for the ETS on its determinations regarding the kind and degree of protective actions needed to protect against exposure to SARS-CoV-2 at work and the feasibility of instituting these provisions. More specifically, the agency's analysis demonstrates that an effective COVID-19 control program must utilize a suite of overlapping controls in a layered approach to better protect workers from exposure to COVID-19. OSHA emphasizes that the infection control practices required by the ETS are most effective when used together. The specific requirements of the ETS are outlined and described in the *Summary and Explanation* (Section VIII of this preamble). OSHA requests comments on the provisions of the ETS and whether it should be adopted as a permanent standard.

**II. History of COVID-19**

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The global pandemic caused by the virus known as SARS-CoV-2 has been wreaking havoc around the world and throughout the United States since early 2020. SARS-CoV-2 causes a respiratory disease called coronavirus disease 2019 or "COVID-19" and can be transmitted easily from person to person. As of March 14, 2021 there had been 118,754,336 confirmed cases of COVID-19 globally, resulting in more than 2,634,370 deaths (WHO, March 14, 2021). As of the same date, there had been over 29,000,561 cases identified in the United States and over 527,068 deaths due to the disease (WHO, March 14, 2021).

The first confirmed case of COVID-19 was identified in the Hubei Province of China in December of 2019 (Chen et al., August 6, 2020). On December 31, 2019, China reported to the WHO that it had identified several influenza-like cases of unknown cause in Wuhan, China (WHO, January 5, 2020). Soon, COVID-19 infections had spread throughout Asia, Europe, and North and South America. By February of 2020, 58 other countries had reported COVID-19 cases (WHO, March 1, 2020). By March of 2020, widespread local transmission of the virus was established in 88 countries. Because of the widespread transmission and severity of the disease, along with what the WHO described as alarming levels of inaction, the WHO officially declared COVID-19 a pandemic on March 11, 2020 (WHO, March 11, 2020).

The first reported case of COVID-19 in the United States was in the state of Washington, on January 21, 2020, in a person who had returned from Wuhan, China on January 15, 2020 (CDC, January 21, 2020). On January 31, 2020, the COVID-19 outbreak was declared to be a U.S. public health emergency in an effort to aid the response by the healthcare community (US DHHS, January 31, 2020). After the initial report of the virus in January 2020, a steep increase in COVID-19 cases in the U.S. was observed though March and early April. In the six weeks between March 1, 2020 and April 12, 2020, the 7-day moving average of new cases rose from

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only 2 to 31,928 (CDC, February 26, 2021a). Then-President Donald Trump declared the COVID-19 outbreak a national emergency on March 13, 2020 (The White House, March 13, 2020). As of March 19, 2020, all 50 states and the District of Columbia had declared emergencies related to the pandemic (NGA, March 19, 2020; NGA, December 4, 2020; Ayanian, June 3, 2020).

The fall to winter 2020 surge in COVID-19 cases and deaths was more dire, with the 7-day moving average of new cases growing from 53,998 on October 15, 2020 to a peak of 249,303 on January 11, 2021 (CDC, February 26, 2021a). Even as total cases began to decline, there were more than 5,000 coronavirus-related deaths in the U.S. *in a single day* on February 12, 2021, a new grim milestone (CDC, February 26, 2021b). COVID-19 was the third leading cause of death in the United States in 2020 among those aged 45 to 84, even though the impact of COVID-19 was effectively isolated to only an eight month period of March to October 2020 (Woolf et al., January 12, 2021). Multiple new SARS-CoV-2 variants have emerged recently, at least one of which shows evidence of increased transmissibility (CDC, January 28, 2021).

Workers in every industry sector in the U.S. have been, and continue to be, impacted by COVID-19. Because SARS-CoV-2 can be transmitted wherever people gather, many workplaces provide an environment where the virus can spread. On January 21, 2021, President Biden issued an Executive Order on Protecting Worker Health and Safety to address the hazard of COVID-19 in places of employment (The White House, January 21, 2021). The President directed OSHA to determine whether any COVID-19 emergency temporary standards were necessary and, if so, to issue them by March 15, 2021.

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**History of COVID-19 References:**

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https://www.phe.gov/emergency/news/healthactions/phe/Pages/2019-nCoV.aspx (US DHHS, January 31, 2020)

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World Health Organization (WHO). (2021, March 14). *WHO Coronavirus Disease (COVID-19) Dashboard*. https://covid19.who.int/table (WHO, March 14, 2021)

**III. Pertinent Legal Authority**

The purpose of the Occupational Safety and Health Act of 1970 (OSH Act), 29 U.S.C. 651 *et seq.*, is "to assure so far as possible every working man and woman in the Nation safe and healthful working conditions and to preserve our human resources." 29 U.S.C. 651(b). To this end, Congress authorized the Secretary of Labor (Secretary) to promulgate and enforce occupational safety and health standards under sections 6(b) and (c) of the OSH Act.[2] 29 U.S.C. 655(b). These provisions provide bases for issuing occupational safety and health standards under the Act. Once OSHA has established as a threshold matter that a health standard is necessary under section 6(b) or (c)—*i.e.*, to reduce a significant risk of material health impairment, or a grave danger to employee health—the Act gives the Secretary "almost

[2] The Secretary has delegated most of his duties under the OSH Act to the Assistant Secretary of Labor for Occupational Safety and Health. Secretary's Order 08-2020, 85 Fed. Reg. 58393 (Sept. 18, 2020). This section uses the terms Secretary and OSHA interchangeably.

DRAFT

unlimited discretion to devise means to achieve the congressionally mandated goal" of protecting employee health, subject to the constraints of feasibility. *See United Steelworkers of Am. v. Marshall*, 647 F.2d 1189, 1230 (D.C. Cir. 1981). A standard's requirements need only be "reasonably related" to the purpose of ensuring a safe and healthful working environment. *Id.* at 1237, 1241; *see also Forging Industry Ass'n v. Sec'y of Labor*, 773 F.2d 1436, 1447 (4th Cir. 1985). OSHA's authority to regulate employers is hedged by constitutional considerations and, pursuant to section 4(b)(1) of the OSH Act, the regulations and enforcement policies of other federal agencies. *Chao v. Mallard Bay Drilling, Inc.*, 534 U.S. 235, 241 (2002).

The OSH Act reflects Congress's determination that the costs of compliance with the Act and OSHA standards are part of the cost of doing business and OSHA may foreclose employers from shifting those costs to employees. *See Am. Textile Mfrs. Inst., Inc. v. Donovan,* 452 U.S. 490 at 514 (1981); *Phelps Dodge Corp. v. OSHRC*, 725 F.2d 1237, 1239-1240 (9th Cir. 1984); *see also Sec'y of Labor v. Beverly Healthcare-Hillview*, 541 F.3d 193 (3d Cir. 2008). Furthermore, the Act and its legislative history "both demonstrate unmistakably" OSHA's authority to require employers to temporarily remove workers from the workplace to prevent exposure to a health hazard. *United Steelworkers of Am.*, 647 F.2d at 1230.

The OSH Act requires the Secretary to issue an emergency temporary standard (ETS) under certain limited circumstances. *See* 29 U.S.C. 655(c). The legal authority to issue an ETS is contained in section 6(c)(1) of the OSH Act, 29 U.S.C. 655(c). That section states:

> The Secretary shall provide, without regard to the requirements of chapter 5, title 5, United States Code, for an emergency temporary standard to take immediate effect upon publication in the Federal Register if he determines – (A) that employees are exposed to grave danger from exposure to substances or agents

DRAFT

determined to be toxic or physically harmful or from new hazards, and (B) that such emergency standard is necessary to protect employees from such danger. 29 U.S.C. 655(c)(1).

A separate section of the OSH Act, section 8(c), authorizes the Secretary to prescribe regulations requiring employers to make, keep, and preserve records that are necessary or appropriate for the enforcement of the Act. 29 U.S.C. 657(c)(1). Section 8(c) also provides that the Secretary shall require employers to keep records of, and report, work-related deaths and illnesses. 29 U.S.C. 657(c)(2).

The ETS provision, section 6(c)(1), exempts the Secretary from procedural requirements contained in the OSH Act and the Administrative Procedure Act, including those for public notice, comments, and a rulemaking hearing. *E.g.,* 29 U.S.C. 655(b)(3); 5 U.S.C. 552, 553. For that reason, ETSs have been referred to as the "most dramatic weapon in [OSHA's] arsenal." *Asbestos Info. Ass'n/N. Am. v. OSHA*, 727 F.2d 415, 426 (5th Cir. 1984).

The Secretary must issue an ETS in situations where employees are exposed to a "grave danger" and immediate action is necessary to protect those employees from such danger. 29 U.S.C. 655(c)(1); *Pub. Citizen Health Research Grp. v. Auchter*, 702 F.2d 1150, 1156 (D.C. Cir. 1983). The determination of what exact level of risk constitutes a "grave danger" is a "policy consideration that belongs, in the first instance, to the Agency." *Asbestos Info. Ass'n*, 727 F.2d at 425 (accepting OSHA's determination that eighty lives at risk over six months was a grave danger); *Indus. Union Dep't, AFL-CIO v. Am. Petroleum Inst.*, 448 U.S. 607, 655 n.62 (1980). However, a "grave danger" represents a risk greater than the "significant risk" that OSHA must show in order to promulgate a permanent standard under section 6(b) of the OSH Act, 29 U.S.C. 655(b). *Int'l Union, United Auto., Aerospace, & Agr. Implement Workers of Am., UAW v.*

DRAFT

*Donovan*, 590 F. Supp. 747, 755-56 (D.D.C. 1984), *adopted*, 756 F.2d 162 (D.C. Cir. 1985); *see also Indus. Union Dep't, AFL-CIO*, 448 U.S. at 640 n.45 (noting the distinction between the standard for risk findings in permanent standards and ETSs).

In determining the type of health effects that may constitute a "grave danger" under the OSH Act, the Fifth Circuit emphasized "the danger of incurable, permanent, or fatal consequences to workers, as opposed to easily curable and fleeting effects on their health." *Fla. Peach Growers Ass'n, Inc. v. U. S. Dep't of Labor*, 489 F.2d 120, 132 (5th Cir. 1974). Although the findings of grave danger and necessity must be based on evidence of "*actual*, prevailing industrial conditions," *see Int'l Union*, 590 F. Supp. at 751, OSHA need not wait for deaths to occur before promulgating an ETS, *see Fla. Peach Growers Ass'n.*, 489 F.2d at 130. When OSHA determines that exposure to a particular hazard would pose a grave danger to workers, OSHA can assume an exposure to a grave danger wherever that hazard is present in a workplace. *Dry Color Mfrs. Ass'n, Inc. v. Department of Labor*, 486 F.2d 98, 102 n.3 (3d Cir. 1973).

In calculating risks, OSHA is limited to assessing the "harm likely to accrue, or the grave danger that the ETS may alleviate" while the standard is in effect *Asbestos Info. Ass'n*, 727 F.2d at 422. In demonstrating necessity, the Fifth Circuit required OSHA to show that there were no other means of addressing the risk than an ETS. *Id.* at 425 (holding that necessity had not been proven where OSHA could have increased enforcement of already-existing standards to address the grave risk to workers from asbestos exposure).

On judicial review of an ETS, OSHA is entitled to great deference on the determinations of grave danger and necessity required under section 6(c)(1). *See, e.g., Pub. Citizen Health Research Grp.*, 702 F.2d at 1156; *Asbestos Info. Ass'n*, 727 F.2d at 422 (judicial review of these legislative determinations requires deference to the agency); *cf. American Dental Ass'n v.*

DRAFT

*Martin*, 984 F.2d 823, 831 (7th Cir. 1993) ("the duty of a reviewing court of generalist judges is merely to patrol the boundary of reasonableness"). These determinations are "essentially legislative and rooted in inferences from complex scientific and factual data." *Pub. Citizen Health Research Grp.*, 702 F.2d at 1156. The agency is not required to support its conclusions "with anything approaching scientific certainty" and has the "prerogative to choose between conflicting evidence." *Indus. Union Dep't, AFL-CIO*, 448 U.S. at 656; *Asbestos Info. Ass'n*, 727 F.2d at 425. When reviewing an ETS to determine whether it meets the substantial evidence standard, *see* 29 U.S.C. 655(f), a court "basically must determine whether the Secretary carried out his essentially legislative task in a manner reasonable under the state of the record before him." *Fla Peach Growers Ass'n.*, 489 F.2d at 129.

Although Congress waived the ordinary rulemaking procedures in the interest of "permitting rapid action to meet emergencies," section 6(e) of the OSH Act, 29 U.S.C. 655(e), requires OSHA to include a statement of reasons for its action when it issues any standard. *Dry Color Mfrs.*, 486 F.2d at 105-6 (finding OSHA's statement of reasons inadequate). By requiring the agency to articulate its reasons for issuing an ETS, the requirement acts as "an essential safeguard to emergency temporary standard-setting." *Id.* at 106. However, the Third Circuit noted that it did not require justification of "every substance, type of use or production technique," but rather a "general explanation" of why the standard is necessary. *Id.* at 107.

ETSs are, by design, temporary in nature. Under section 6(c)(2), an ETS is effective "until superseded by a standard promulgated in accordance with" section 6(c)(3). 29 U.S.C. 655(c)(2), (3). Under section 6(c)(3), the ETS serves as a proposal for a permanent standard in accordance with section 6(b) of the OSH Act (permanent standards), and the Act calls for the

DRAFT

permanent standard to be finalized within six months after publication of the ETS. *Id.* at § 655(c)(3); *see Fla. Peach Growers Ass'n.*, 489 F.2d at 124.

It is crucial to note that the language of section 6(c)(1) is not discretionary: the Secretary "shall" provide for an ETS when OSHA makes the prerequisite findings of grave danger and necessity. *Pub. Citizen Health Research Grp.*, 702 F.2d at 1156 (noting the mandatory language of section 6(c)). OSHA is entitled to great deference in its determinations, and it must also account for "the fact that 'the interests at stake are not merely economic interests in a license or a rate structure, but personal interests in life and health.'" *Id.* (quoting *Wellford v. Ruckelshaus,* 439 F.2d 598, 601 (D.C. Cir. 1971)).

## IV. Rationale for the ETS

### A. Grave Danger

#### i. Introduction

The Occupational Safety and Health Act of 1970 (OSH Act), in section 29 U.S.C. § 655(c)(1), requires OSHA to promulgate an emergency temporary standard (ETS) if it determines that such a standard is "necessary" to protect employees from a "grave danger" caused by exposure to "physically harmful" agents or "new hazards." On January 31, 2020, the Secretary of Health and Human Services (HHS) declared COVID-19 to be a public health emergency in the U.S. under section 319 of the Public Health Service Act. The World Health Organization declared COVID-19 to be a global health emergency on the same day. President Donald Trump declared the COVID-19 outbreak to be a national emergency on March 13, 2020 (The White House, March 13, 2020). HHS renewed its declaration of COVID-19 as a public health emergency effective January 21, 2021.

Consistent with these declarations, and in carrying out its legal duties under the OSH Act, OSHA has determined that employees face a grave danger from the new hazard of workplace

DRAFT

exposures to SARS-CoV-2. The virus is both a physically harmful agent and a new hazard, and it can cause severe illness, persistent health effects, and death (morbidity and mortality, respectively) from the subsequent development of the disease, COVID-19.[3] OSHA bases its grave danger determination on evidence demonstrating the lethality of the disease, the serious physical and psychiatric health effects of COVID-19 short of death (in severe as well as in mild-to-moderate cases), and the transmissibility of the disease in typical workplace settings. The protections of this ETS, which apply to all workplaces where people share space or interact with others, are designed to protect employees from infection with SARS-CoV-2 and from the dire, sometimes fatal, consequences of such infection.

The fact that COVID-19 is not a uniquely work-related hazard does not change the determination that it is a grave danger to which employees are exposed, nor does it excuse employers from their duty to protect employees from the occupational transmission of SARS-CoV-2, the virus that causes COVID-19. The OSH Act is intended to "assure so far as possible every working man and woman in the Nation safe and healthful working conditions," 29 U.S.C. 651(b), and there is nothing in the Act to suggest that its protections do not extend to hazards which might occur outside of the workplace as well as within. Indeed, COVID-19 is not the first hazard that OSHA has regulated that occurs both inside and outside the workplace. The hazard of noise is not unique to the workplace, but the Fourth Circuit has upheld OSHA's standard, 29 C.F.R. § 1910.95, regulating workplace exposure to it (*Forging Industry Ass'n v. Secretary*, 773 F.2d 1437, 1444 (4th Cir. 1985)). Diseases caused by bloodborne pathogens, including HIV/AIDS and hepatitis B, are also not unique to the workplace, but the Seventh Circuit has

[3] OSHA is defining the grave danger as workplace exposure to SARS-CoV-2, the virus that causes the development of COVID-19. COVID-19 is the disease that can occur in people exposed to SARS-CoV-2, and that leads to the health effects described in this section. This distinction applies despite OSHA's use of these two terms interchangeably in some parts of this preamble.

DRAFT

upheld the majority of OSHA's standard, 29 C.F.R. § 1910.1030, regulating workplace exposure to bloodborne pathogens (*Am. Dental Ass'n v. Martin*, 984 F.2d 823 (7th Cir. 1993) (upholding majority of OSHA's bloodborne pathogens standard)). Moreover, employees have much more freedom to control their environment outside of work, and to make decisions about their behavior and their contact with others in order to mitigate their risk of exposure to SARS-CoV-2. During the workday, while under the control of their employer, employees might be required to work in an environment in which they have little control over the presence or behavior of others, which may result in exposure to SARS-CoV-2. Accordingly, even though SARS-CoV-2 is a hazard to which employees are exposed both inside and outside the workplace, employees are much less able to mitigate their exposures at work, where they are exposed to co-workers, because they are in an employer-controlled work environment. OSHA has a mandate to protect employees from hazards they are exposed to at work, even if they are also exposed to similar hazards before and after work.

As described above in Section III, Legal Authority, "grave danger" indicates a risk that is more than "significant" (*Int'l Union, United Auto., Aerospace, & Agr. Implement Workers of Am., UAW v. Donovan*, 590 F. Supp. 747, 755-56 (D.D.C. 1984); *Indus. Union Dep't, AFL-CIO v. Am. Petroleum Inst.*, 448 U.S. 607, 640 n.45, 655 (1980) (stating that a rate of 1 worker in 1,000 workers suffering a given health effect constitutes a "significant" risk)). "Grave danger," according to one court, refers to "the danger of incurable, permanent, or fatal consequences to workers, as opposed to easily curable and fleeting effects on their health" (*Fla. Peach Growers Ass'n, Inc. v. U. S. Dep't of Labor*, 489 F.2d 120, 132 (5th Cir. 1974)). Fleeting effects were described as nausea, excessive salivation, perspiration, or blurred vision and were considered so minor that they often went unreported, which is in contrast to the adverse health effects of cases

DRAFT

of COVID-19, which are formally referenced as ranging from "mild" to "severe." Beyond this, however, "the determination of what constitutes a risk worthy of Agency action is a policy consideration that belongs, in the first instance, to the Agency" (*Asbestos Info. Ass'n/N. Am. v. OSHA*, 727 F.2d 415, 425 (5th Cir. 1984)).

In the context of ordinary 6(b) rulemaking, the Supreme Court has said that the OSH Act is not a "mathematical straitjacket," nor does it require the agency to support its findings "with anything approaching scientific certainty," particularly when operating on the "frontiers of scientific knowledge" (*Indus. Union Dep't, AFL-CIO v. Am. Petroleum Inst.*, 448 U.S. 607, 656, 100 S. Ct. 2844, 2871, 65 L. Ed. 2d 1010 (1980)). Courts reviewing OSHA's determination of grave danger do so with "great deference" (*Pub. Citizen Health Research Grp. v. Auchter*, 702 F.2d 1150, 1156 (D.C. Cir. 1983)). In one case, the Fifth Circuit, in reviewing an OSHA ETS for asbestos, declined to question the agency's finding that 80 worker lives were at risk over six months constituted a grave danger (*Asbestos Info. Ass'n/N. Am.*, 727 F.2d at 424). In stark contrast, the average daily death total (7-day average) in the U.S. from COVID-19 was over 3,000 deaths each day from January 9 to February 10 in 2021 (CDC, February 23, 2021a). Here, the mortality and morbidity risk to employees from COVID-19 is so dire that the grave danger from exposures to SARS-CoV-2 is clear.

OSHA's previous ETSs addressed physically harmful agents that had been familiar to the agency for many years prior to the ETS. In most cases, the ETSs were issued in response to new information about substances that had been used in workplaces for decades (e.g., Vinyl Chloride (39 FR 12342 (April 5, 1974); Benzene (42 FR 22516 (May 3, 1977)); 1,2 Dibromo-3 chloropropane (42 FR 45536 (Sept. 9, 1977)). In some cases, the hazards of the toxic substance were already so well established that OSHA promulgated an ETS simply to update an existing

DRAFT

standard (e.g., Vinyl cyanide (43 FR 2586 (Jan. 17, 1978)). In no case did OSHA claim that an ETS was required to address a grave danger from a substance that had only recently come into existence. Thus, no court has had occasion to separately examine OSHA's authority under section (6)(c) of the OSH Act (29 U.S.C. 655(c)) to address a grave danger from a "new hazard." Yet by any measure, SARS-CoV-2, the virus that causes COVID-19 (also known as the 2019 Novel Coronavirus), is a new hazard. Unlike any of the hazards addressed in previous ETSs, SARS-CoV-2 was not known to exist until just over a year before OSHA issued this ETS. In that short time, the virus has already killed almost two and a half million people worldwide and more than half a million people in the U.S. alone (CDC, March 5, 2021). Many of those, as demonstrated by the discussion below, were employees in the U.S. Clearly, exposure to SARS-CoV-2 is a new hazard that presents a grave danger to workers in the U.S.

In the following sections within *Grave Danger*, OSHA summarizes the best available scientific evidence on employee exposure to SARS-CoV-2 and shows how that evidence establishes COVID-19 to be a grave danger. OSHA's determination that there is a grave danger to employees rests on both the severe health consequences of COVID-19 and the high risk to employees of developing the disease as a result of transmission of SARS-CoV-2 in the workplace. With respect to the health consequences of COVID-19, OSHA finds a grave danger to employees based on the current mortality data showing people of working age (18-64 years old) have a 1 in 227 chance of dying when they contract the disease. When broken down by age range, that includes a 1 in 813 chance of dying for those aged 30-39, a 1 in 307 chance of dying for those aged 40-49, and as much as a 1 in 82 chance of dying for those aged 50-64 (CDC, February 23, 2021b,c). Furthermore, workers in racial and ethnic minority groups are over-represented in many frontline occupations and face higher risks for SARS-CoV-2 exposure and

DRAFT

infection (Hawkins, June 15, 2020), as discussed in more detail in the section "Observed Disparities in Risk Based on Race and Ethnicity," below.

OSHA also finds a grave danger based on the severity and prevalence of other health effects caused by COVID-19, short of death. While some SARS-CoV-2 infections are asymptomatic, even the cases labeled "mild" by the CDC involve symptoms that far exceed in severity the group of symptoms dismissed by the *Florida Peach Growers Ass'n* court as not rising to the level of grave danger required by the OSH Act (i.e., minor cases of nausea, excessive salivation, perspiration, or blurred vision) (489 F.2d at 132). Even "mild" cases of COVID-19 require quarantine and might require medical intervention and multiple weeks of recuperation, while severe cases of COVID-19 typically require hospitalization and a very long recovery period (see the section on "Health Effects," below). Over three quarters of hospitalized cases and approximately half of all symptomatic cases result in the individual still experiencing symptoms at least six months after being infected (Huang et al., January 8, 2021; Klein et al., February 2021), These cases might be referred to as "long COVID" because symptoms persist long after recovery from the initial illness, and could potentially be significant enough to negatively affect an individual's ability to work or perform other everyday activities.

Finally, OSHA concludes that the serious and potentially fatal consequences of COVID-19 pose a particular threat to employees, as the nature of SARS-CoV-2 transmission readily enables the virus to spread when employees are working in spaces shared with others (e.g., co-workers, customers, patients, visitors), a common characteristic of most workplaces that have not been able to implement a primarily telework model during this pandemic. While not every workplace is represented in the evidence that OSHA has assembled, the best available evidence

DRAFT

illustrates that clusters and outbreaks[4] of COVID-19 have occurred in a wide variety of occupational settings that contain shared spaces for employees. The scientific evidence of SARS-CoV-2 transmission, presented below, makes clear that the virus can be spread wherever an employee shares space with other people, and OSHA therefore expects transmission across all workplaces that hold that common characteristic (*see Dry Color Mfrs. Ass'n, Inc. v. Dep't of Labor*, 486 F.2d 98, 102 n.3 (3d Cir. 1973) (holding that when OSHA determines a substance poses a grave danger to workers, OSHA can assume an exposure to a grave danger wherever that substance is present in a workplace)). OSHA's conclusion that there is a grave danger to which employees are specifically exposed is further supported by evidence demonstrating the widespread prevalence of the disease across the country generally, and in the workforce specifically. As of March 2021, over 28 million cases of COVID-19 have been reported in the United States (CDC, March 5, 2021). Over 1 in 14 people of working age have been reported infected (cases for individuals age 18-64, CDC, February 23, 2021b; estimated number of people ages 15-64, Census Bureau, June 2020). And data shows that employees across a myriad of workplace settings have suffered death and serious illness from COVID-19 throughout the duration of the pandemic (WDH and WLNI, November 10, 2020; Allan-Blitz et al., December 11, 2020; Marshall et al., June 30, 2020).[5] While the most fatal days of the winter 2020-21 surge

DRAFT

[4] "Outbreaks" are generally defined as an increase, often sudden, in the number of cases of a disease above what is normally expected in a limited geographic area. "Clusters" are generally defined as an unusual number of cases grouped in one place that is more than expected to occur (CDC, May 18, 2012). Researchers investigating outbreaks have to decide how to define the geographic area, while researchers investigating clusters may use a variety of strategies to determine what is "unusual." While the terms are slightly different, their overall significance to the grave danger discussion is the same. For the studies and reports relied upon in this section, OSHA will generally use whichever term is used in the study or report itself.

[5] Of note, on February 25, 2021, the Superior Court of California issued a decision denying a motion for a preliminary injunction seeking to restrain the California Occupational Safety and Health Standards Board from enforcing a COVID-19 ETS promulgated on November 30, 2020 (*Nat'l Retail Fed'n v. Cal. Dep't of Indus. Relations, Div. of Occupational Safety & Health*, Case Nos. CGC-20-588367, CPF-21-517344 (Cal. Super. Ct., Feb. 25, 2021)). In its decision, the court found that COVID-19 presents an emergency to employees, noting that any argument to the contrary was "fatuous" (*id.* at 17). The court found that "the virus spreads ***any place*** where persons

may be behind the nation, the daily new cases are still approximately twice what they were in mid-September 2020, and have remained steady since late February 2021 (CDC, March 4, 2021). Thus, COVID-19 continues to present a grave danger to the nation's workers.

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gather and come into contact with one another—whether it happens to be an office building, a meatpacking plant, a wedding reception, a business conference, or an event in the Rose Garden of the White House. Workplaces, where employees often spend eight hours a day or more in close proximity to one another, are no exception, which of course is why the pandemic has emptied innumerable office buildings, stores, shopping centers, restaurants, and bars around the world" (*id.* at 17-18 (emphasis in original) (footnotes omitted)).

DRAFT

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**ii. Nature of the Disease**

**a. Health and Other Adverse Effects of COVID-19**

*Death from COVID-19*

COVID-19 is a potentially fatal disease. As of March 5, 2021, there had been 517,224 deaths from the disease out of 28.5 million infections in the United States alone (CDC, March 5, 2021). Thus, as of March 5, 2021, for the entire U.S. population, 1.8% of known SARS-CoV-2 infections have resulted in death (CDC, March 5, 2021). This number is staggering when compared with, for example, the 2018-2019 influenza season, during which only 0.1% of known influenza infections were estimated to be fatal (CDC, October 5, 2020). For the U.S. population as a whole (i.e., unlinked to known SARS-CoV-2 infections) as of March 5, 2021, COVID-19 has killed 1.58 out of every 1,000 people (CDC, March 5, 2021; estimated number of people, Census, June 2020). COVID-19 was the third leading cause of death in the United States in 2020 among those aged 45 to 84, trailing only heart disease and cancer (Woolf, December 17, 2020).

DRAFT

During the surges in the spring and fall/winter of 2020, COVID-19 was the leading cause of death. Between November and mid-December of 2020, the weekly average of daily COVID-19 deaths tripled, from 826 to 2,430 deaths per day; by comparison, heart disease and cancer, which have been the leading causes of death for decades, cause approximately 1,700 and 1,600 deaths per day, respectively (*id*.). There were more than 5,000 coronavirus-related deaths in the U.S. *in a single day* on February 12, 2021, which, to date, is the most lethal day for Americans during this pandemic (CDC, February 23, 2021a).

As noted in further detail below in the section "Immunity and Vaccination Do Not Eliminate the Grave Danger," exposure to SARS-CoV-2 will remain a grave danger absent a significant and sustained reduction in the current scale of infections and transmission. The risk of mortality and morbidity from COVID-19 may change over time. Viruses mutate and those mutations can impact how transmissible and deadly they are. For example, the UK's New and Emerging Respiratory Virus Threats Advisory Group (NERVTAG) issued a report on how risk might have changed with the development of a new variant there called "B.1.1.7" (February 11, 2021). The group determined that analysis from multiple different datasets indicated that B.1.1.7 infections resulted in an increased risk of hospitalization and death compared with the ancestral virus and other variants in circulation. Challen et al., (March 10, 2021) found that B.1.1.7 increased mortality risk by 64%. Virus mutations can also impact the effectiveness of medical countermeasures such as therapeutics and vaccines. Lastly, they can increase reinfection rates among those who have natural immunity from prior infection.

*Severe and Critical Cases of COVID-19*

Even when not lethal, COVID-19 causes significant morbidity that can result in incurable, permanent, and non-fleeting consequences. People who become ill with COVID-19

DRAFT

might require hospitalization and specialized treatment, and can suffer respiratory failure, blood clots, long-term cardiovascular effects, organ damage, and significant neurological and psychiatric effects. And because the virus has only been present in this country for just over a year, the complete long-term effects are still unknown and could be linked to even higher mortality and morbidity rates. A severe case of COVID-19 is described as when the patient presents with hypoxia (low oxygen in the tissues) and is in need of oxygen therapy (NIH, December 17, 2020). Cases become critical when respiratory failure, septic shock, and/or multiple organ dysfunction occurs.

Approximately 8.9% of COVID-19 cases are severe and require hospitalization and more specialized care (average 7-day new hospitalizations and average 7-day new cases, CDC, February 12, 2021). The number of COVID-19 hospitalizations increased dramatically over the last few months of 2020 as the number of COVID-19 cases soared. After reaching a low of 29,579 hospitalizations on September 27, 2020, after the summer surge, hospitalizations rose steadily for several months and peaked at 132,474 on January 6, 2021 (as of January 23, 2021), which at that time meant about 1 in 2,500 adults in the entire United States was hospitalized with COVID-19 (COVID Tracking Project, January 23, 2021).

The majority of the data currently available on the health outcomes for hospitalized patients is derived from the first surge of the pandemic between March and May of 2020. However, some newer information indicates that health outcomes for these patients have changed over the course of the pandemic. A study from Emory University reviewed COVID-19 patient data from a large multihospital healthcare network and compared the data from the first surge early in the pandemic (March 1 to May 30, 2020) with the second surge that occurred in the summer of 2020 (June 1 to September 13, 2020) (Meena et al., March 1, 2021). The study

DRAFT

found that during the second surge, ICU admission decreased from 38% to 30%, ventilator use decreased from 26% to 15%, and mortality decreased from 15% to 9%. Although the study was limited to patients in one healthcare network, these reductions in ICU admission, ventilator use, and mortality may have occurred in other hospital settings as well.

This data on improvements in health outcomes between the first and second surges is significant, but also demonstrates that overall health outcomes for hospitalized COVID-19 patients remains quite poor. Even with these improvements, COVID-19 still results in considerable loss of life and significant adverse health outcomes for patients hospitalized with COVID-19. The COVID-19-Associated Hospitalization Surveillance Network (COVID-NET), which conducts population-based surveillance in select U.S. counties, reported an overall cumulative hospitalization rate for the entire U.S. population of 343.4 per every 100,000 people between March 1, 2020, and January 2, 2021 (CDC, January 8, 2021).

Patients hospitalized with COVID-19 frequently need supplemental oxygen and supportive management of the disease's most common complications, which are discussed in further detail below and include pneumonia, respiratory failure, acute respiratory distress syndrome (ARDS), acute kidney injury, sepsis, myocardial injury, arrhythmias, and blood clots. Among 35,302 inpatients in a nationwide U.S. study, median length of stay was 6 days overall (Rosenthal, et al., December 10, 2020). When cases required treatment in the ICU, ICU stays were on median 5 days in addition to time spent hospitalized outside of the ICU.

The pneumonia caused by the SARS-CoV-2 virus can become severe, resulting in respiratory failure and ARDS, a life-threatening lung injury. In a U.S. study of 35,302 COVID-19 inpatients, 55.8% suffered respiratory failure with 8.1% experiencing ARDS (Rosenthal, et al., December 10, 2020). Thus, the need for oxygen therapy is a key reason for hospitalization.

DRAFT

The specific therapy received during hospitalization often depends on the severity of lung distress and can include supplemental oxygen, noninvasive ventilation, intubation for invasive mechanical ventilation, and extracorporeal membrane oxygenation when mechanical ventilation is insufficient (NIH, December 3, 2020).

Although COVID-19 was initially considered to be primarily a respiratory disease, adverse effects in numerous organs have now been reported. For example, in a New York City area study of 9,657 COVID-19 patients, 39.9% of patients developed acute kidney injury (AKI), which is a sudden episode of kidney failure or kidney damage, of whom 17% required dialysis (Ng et al., September 19, 2020). AKI similarly occurred in 33.9% of 35,302 inpatients in a nationwide U.S. study (Rosenthal et al., December 10, 2020). For patients who experience AKI from COVID-19, a study of patients in the New York area reported a median length of stay in the hospital of 11.6 days for patients who did not require dialysis, but for those who did, the median length of stay almost tripled – to 29.2 days (Ng et al., September 19, 2020). Many COVID-19 patients require continuous renal replacement therapy (NIH, December 3, 2020). For example, one study including 67 U.S. hospitals found that 20.6% of critically ill COVID-19 patients developed AKI that requires renal replacement therapy (Gupta et al., 2021).

COVID-19 is also capable of causing viral sepsis. Sepsis is a condition where the immune response dysregulates and causes life-threatening harm to organs (e.g., lungs, brain, kidneys, heart, and liver). In Rosenthal et al.'s (2020) U.S. study, 33.7% of COVID-19 inpatients had sepsis. A study of 18-49 year olds in the COVID-NET surveillance system found that 16.6% of patients in that age range developed sepsis (Owusu et al., December 3, 2020). In a study of VA hospitals, sepsis was found to be the most common complication that resulted in readmission within 60 days of being discharged (Donnelly et al., January 19, 2020).

DRAFT

COVID-19 patients have also been reported to experience a number of adverse cardiac complications, including arrhythmias, myocardial injury with elevated troponin levels, and myocarditis (Caforio, December 2, 2020). Acute ischemic heart disease occurred in 8% of 35,302 inpatients in a nationwide U.S. study (Rosenthal et al., December 10, 2020). Patients hospitalized with COVID-19 may also experience shock, a critical condition caused by a sudden drop in blood pressure that can lead to fatal cardiac complications. Shock occurred in 4,028 of 35,302 (11.4%) inpatients in a nationwide U.S. study (Rosenthal et al., December 10, 2020). And a study of 70 COVID-19 patients in a Freiburg ICU found that shock was a complicating factor in 24% of fatal cases (Rieg et al., November 12, 2020). A New York City area study reported that 21.5% of the study's 9,657 patients experience serious drops in blood pressure that required medical intervention during their hospital stay (Ng et al., September 19, 2020).

In addition to its adverse effects on specific organs, COVID-19 might cause patients to develop a hypercoagulable state, a condition in which blood clots can develop in someone's legs and embolize to their lungs, further worsening oxygenation. Blood clots in COVID-19 patients have also been reported in arteries, resulting in strokes—even in young people—as well as heart attacks and acute ischemia from lack of oxygen in limbs in which arterial clots have occurred (Cuker and Peyvandi, November 19, 2020; Oxley et al., May 14, 2020). Blood clots have been reported even in COVID-19 patients on prophylactic-dose anticoagulation. A systematic review of more than 28,000 COVID-19 patients found that venous thromboembolism (deep vein thrombosis, pulmonary embolism or catheter-related thrombosis) occurred in 14% of hospitalized patients overall and 22.7% of ICU patients (Nopp et al., September 25, 2020). Pulmonary embolism was reported in 3.5% of non-ICU and 13.7% of ICU patients. Embolism and thrombosis can cause death. COVID-19 poses such a threat of blood clots that NIH

DRAFT

guidelines now recommend that hospitalized non-pregnant adults with COVID-19 should receive prophylactic dose anticoagulation (NIH, December 3, 2020).

*Mild to Moderate Cases of COVID-19*

Even the less severe health effects of COVID-19 cover a wide range of symptoms and severity, from serious illness to milder symptomatic illness to asymptomatic cases. The most common symptoms include fever or chills, cough, shortness of breath or difficulty breathing, fatigue, muscle or body aches, headache, developing a loss of taste or smell, sore throat, congestion or runny nose, nausea, vomiting, and/or diarrhea (CDC, December 22, 2020).

Approximately 80% of symptomatic COVID-19 cases are mild to moderate (Wu and McGoogan, April 7, 2020), which is defined as having any symptom of COVID-19 but without substantially decreased oxygen levels, shortness of breath, or difficulty breathing (NIH, December 17, 2020). Moderate cases, however, also show evidence of lower respiratory disease, although these cases largely do not require admission into hospitals (CDC, December 8, 2020). While the deaths and "severe" health consequence of COVID-19 are more than enough to support OSHA's finding that COVID-19 presents a grave danger, even many of the typical mild or moderate cases surpass the *Florida Peach Growers* threshold of "fleeting effects . . . so minor that they often went unreported" (supra). Mild and moderate cases can be treated at home but still require medical intervention (typically through telehealth visits) (Wu and McGoogan, April 7, 2020). Individuals with mild cases often need at least one to two weeks to recover enough to resume work, but effects can potentially last for months. Fatigue, headache, and muscle aches are among the most commonly-reported symptoms in people who are not hospitalized (CDC, December 8, 2020), and their effects are not fleeting and often linger. In a multistate telephone survey of 292 adults with COVID-19, the majority of whom did not eventually require

DRAFT

hospitalization, 274 (94%) of the survey respondents were symptomatic at the time of their SARS-CoV-2 test, reporting illness for a median of three days prior to the positive test (Tenforde et al., July 24, 2020). Around one third of symptomatic respondents (95 of 274) reported that they still had not returned to their usual state of health 2-3 weeks after testing positive. Even among the young adults (aged 18-34 years) with no chronic medical conditions, nearly one in five had not returned to their usual state of health 2-3 weeks after testing.

Even though these cases rarely result in hospitalization, individuals with mild to moderate cases of COVID-19 are also significantly impacted by their illness as a result of CDC isolation recommendations. According to the current CDC criteria, a person with symptomatic COVID-19 should generally discontinue isolation only when all three of the following conditions have been met: (1) at least 10 days have passed since symptom onset; (2) at least 24 hours have passed since experiencing a fever without the use of fever-reducing medications; and (3) other symptoms have improved (CDC, December 3, 2020). And the CDC notes with respect to the first criteria that individuals with severe illness or with compromised immunity might require up to 20 days of isolation. Even those with mild or moderate cases of COVID-19 may be prevented by their illness from working from home during the period of isolation.

DRAFT

*Asymptomatic Cases of SARS-CoV-2 Infections*

There is uncertainty about what proportion of SARS-CoV-2 infections are without symptoms. A recent meta-analysis estimated asymptomatic prevalence by using 13 studies the authors determined to have a low risk of bias, in which the asymptomatic prevalence ranged from 4% to 41% (Byambasuren et al., December 11, 2020). Through their analysis of these studies, the authors determined that around 17% of infections are likely asymptomatic. The authors also noted that a limitation of their analysis was that the underlying studies did not

provide information on confounding variables, such as age or co-morbidities which may potentially impact whether an infection produces symptoms.

Asymptomatic COVID-19 cases and even exposure to SARS-CoV-2, in and of itself, also result in significant and non-fleeting, adverse outcomes to the employee because of the considerable impact of quarantine or isolation. Pursuant to CDC guidance, employees who test positive for COVID-19 but are asymptomatic must isolate themselves for at least ten days from when the test was taken in order to avoid further spreading the disease. When an employee is exposed to someone who has COVID-19, even an employee who never becomes infected is affected. Under CDC guidance, employees who have had close contact with an active COVID-19 case should quarantine themselves for up to 14 days, regardless of whether they develop any symptoms (CDC, December 10, 2020). Testing can shorten this period, but an individual would still wait until five days after an exposure to be tested due to the incubation period of the virus and then wait additional time before returning to work. If employees live with an ill person or provide care for that person, then they would quarantine even longer: until ten days after the ill person's symptoms appeared (or, if not ill, the date of the positive test for an asymptomatic individual), plus up to 14 days after that. Thus, it is plausible for an employee who has never been infected to be required to quarantine from work for as long as 24 days under the CDC guidance. Even with adequate testing available, that number would only be reduced to 17 days. The impacts of isolation and quarantine, which could range from loss of wages to mental health implications, constitute an additional and substantial adverse effect on employees caused by exposure to SARS-CoV-2.

*Longer-Term Health Effects*

DRAFT

Recovery from acute infection with the SARS-CoV-2 virus can be prolonged. Three categories of patients in particular require ongoing care after resolution of their acute viral infection: those with a severe illness requiring hospitalization (especially ICU care); those with a specific medical complication from the infection, such as a stroke; and those with milder acute illnesses who experience persistent symptoms such as fatigue and breathlessness. The lingering of, or development of, related health effects after a SARS-CoV-2 infection is known as post-acute sequelae. Recovery can be prolonged even in previously healthy young adults with milder infections. Some people experience persistent symptoms for weeks or even months after the acute infection. Post-Acute COVID-19 syndrome has been proposed as a diagnostic term for these patients, although the term "long COVID" is more common outside the medical community. According to the CDC, the most common symptoms of this syndrome are fatigue, shortness of breath, cough, and joint and chest pain (CDC, November 13, 2020). Other symptoms reported by these patients include decreased memory and concentration, depression, muscle pain, headache, intermittent fever, and racing heart (CDC, November 13, 2020). The cause of these long-term effects and effective treatments have yet to be established. The report from the Pulmonary Breakout Session of the National Institute of Allergy and Infectious Diseases (NIAID) Workshop on Post-Acute Sequelae of COVID-19 stated that the "burden of post-acute sequelae overall could be enormous" (NIAID, December 4, 2020). Dr. John Brooks, the chief medical officer for the CDC's COVID-19 response, said he expected long-term symptoms would affect "on the order of tens of thousands in the United States and possibly hundreds of thousands" (Belluck, December 5, 2020).

Prolonged illness is fairly common in patients who required hospitalization because of COVID-19, and particularly in those who required ICU admission. In a large nationwide U.S.

DRAFT

study, 18.5% of hospitalized patients were discharged to a long-term care or rehabilitation facility (Rosenthal et al., December 10, 2020). Of 1,250 patients in a Michigan study, 12.6% were discharged to a skilled nursing or rehabilitation facility and 15.1% of hospital survivors were re-hospitalized within 60 days of discharge (Chopra et al., November 11, 2020). Of the 195 who were employed prior to hospitalization, 23% were unable to return to work due to health reasons and 26% of those who returned to work required reduced hours or modified duties (Chopra et al., November 11, 2020). Those who returned to work did so a median of 27 days after hospital discharge (Chopra et al., November 11, 2020). Existing evidence indicates that COVID-19 patients requiring ICU care and mechanical ventilation may experience Post Intensive Care Syndrome (PICS), which is a constellation of cognitive dysfunction, psychiatric conditions, and/or physical disability that persists after patients leave the ICU (Society of Critical Care Medicine, 2013). In a study at 3 months post-discharge of 19 COVID-19 patients who required mechanical ventilation while hospitalized, 89% reported pain or discomfort, 47% experienced decreased mobility, and 42% experienced anxiety/depression (Valent, October 10, 2020). The authors noted that these results are similar to those reported in follow-up studies of patients who survived ARDS due to other viral infections. Many employees hospitalized with COVID-19 will require a long period of recovery if COVID-19 recovery continues to follow the same trajectory. In a 5-year follow-up of 67 previously-employed ARDS survivors, 51% had not returned to work within one year of discharge and 31% had not returned at five years (Kamdar, February 1, 2018).

Several studies have noted the persistence of COVID-19 symptoms after hospital discharge. In a study of 1,733 discharged patients in China, 76% reported at least one symptom of COVID-19 six months after hospital discharge with 63% experiencing persistent fatigue or

DRAFT

muscle weakness (Huang et al., January 8, 2021). Similarly, an Irish study found 52% of 128 patients reported persistent fatigue a median of 10 weeks after initial symptoms first appeared (Townsend et al., November 9, 2020). A study of 991 pregnant women (5% hospitalized) in the U.S. found that the median time for symptoms to resolve was 37 days and that 25% had persistent symptoms (mainly cough, fatigue, headache, and shortness of breath) eight weeks after onset (Afshar et al., October 6, 2020).

A study of 86 previously-hospitalized Austrian patients observed that 88% had CT scans still indicating lung damage at 6 weeks after their hospital discharge; at 12 weeks, 56% of CT scans still revealed damage (European Respiratory Society, September 7, 2020). A study of 152 previously-hospitalized patients with laboratory-confirmed COVID-19 disease who required at least 6 liters of oxygen during admission found that 30 to 40 days after discharge, 74% reported shortness of breath and 13.5% still required oxygen at home (Weerahandi et al., August 14, 2020). A UK study found that among 100 hospitalized patients (32% required ICU care), 72% of the ICU patients and 60% of the non-ICU patients reported fatigue a mean of 48 days after discharge (Halpin et al., July 27, 2020). Breathlessness was also common, affecting 65.6% of ICU patients and 42.6% of non-ICU patients.

In a New York City study, of the 108 survivors among 638 patients who required dialysis for AKI while hospitalized, 33 still needed dialysis at discharge (Ng et al., September 19, 2020). A study of Chinese patients reported that 11% of 333 hospitalized patients with COVID-19 pneumonia developed AKI (Pei et al., June, 2020). Only half (45.7%) experienced complete recovery of kidney function with a median follow up of 12 days. A similar study in Spain also found only half (45.72%) experienced complete recovery with a median follow up of 11 days (Procaccini et al., February 14, 2021). A Hong Kong study provided a longer follow up period

DRAFT

including 30 and 90 days after the initial AKI event with a recovery of 87.3% and 92.1%, respectively (Teoh et al., 2021). However, it should be noted that the Hong Kong data set also noted 84.6% recovery seven days after the AKI event, which may indicate a confounder within populations. A study in New York City found that 77.1% of patients with AKI experienced complete recovery during the follow up period, excluding those who died or were sent to hospice (Charytan et al., January 25, 2021). While 88% of these AKI cases were in March and April with a final follow-up date of August 25, it is uncertain how long it took for recovery to occur.

Long-term cardiovascular effects also appear to be fairly common after SARS-CoV-2 infections, even among those who did not require hospital care. A German study evaluated the presence of myocardial injury in 100 patients a median of 71 days after COVID-19 diagnosis (Puntmann et al., July 27, 2020). While only a third (33%) of study participants had required hospitalization, cardiovascular magnetic resonance (CMR) imaging was abnormal in 78%. In the U.S., a study of COVID-19 cases in college athletes of whom sixteen (30%) were asymptomatic, abnormal findings were identified in 27 (56.3%) of the 48 athletes completing both imaging studies with 39.5% consistent with resolving pericardial inflammation (Brito et al., November 4, 2020). A small number remained very symptomatic with fatigue and shortness of breath at 5 weeks and were referred to cardiac rehabilitation (Lowry, November 12, 2020). Among 26 competitive athletes at another university, 4 had CMR findings suggestive of myocarditis and 8 additional athletes exhibited findings suggestive of prior myocardial injury (Rajpal et al., September 11, 2020).

A database for clinicians in the UK to report COVID-19 patients with neurological complications revealed that 62% of the initial 125 patients enrolled presented with a cerebrovascular event including ischemic strokes and intracerebral hemorrhages (Varatharaj et

DRAFT

al., June 25, 2020). A UK study comparing COVID-19 ischemic stroke and intracerebral cases with similar non-COVID-19 cases found a fatality rate of 19.8% for COVID-19 patients in comparison to a fatality rate of 6.9% for non-COVID-19 patients (Perry et al., 2021). As discussed above, PICS, involving prolonged impairments in cognition, physical health, and/or mental health, may also occur. Other neurologic diagnoses, including encephalopathy, Guillain-Barre syndrome, and a range of other less-common diagnoses, may cause morbidity that persists during recovery (Elkind et al., January 9, 2021; Sharifian-Dorche et al., August 7, 2020). A recent autopsy study of brain tissue from 18 COVID-19 patients reported the presence of small blood vessel inflammation and damage in multiple different brain areas (Lee et al., February 4, 2021). Persistent abnormalities in brain imaging have also been reported in patients after discharge (Lu et al., August 3, 2020). A study of 509 hospitalized patients in the Chicago area early in the pandemic reported that a third had encephalopathy, resulting in symptoms such as confusion or decreased levels of consciousness (Liotta et al., October 5, 2020). Encephalopathy was associated with worse functional outcomes at discharge (only 32% were able to handle their own affairs without assistance) and higher deaths in the 30 days post-discharge.

COVID-19 also impacts mental health, both as a result of the toll of living and working through such a disruptive pandemic, but also because of actual medical impacts the virus might have on the brain itself. As de Erausquin notes, SARS-CoV-2 is a suspected neurotropic virus and "neurotropic respiratory viruses have long been known to result in chronic brain pathology including emerging cognitive decline and dementia, movement disorders, and psychotic illness. Because brain inflammation accompanies the most common neurodegenerative disorders and may contribute to major psychiatric disorders, the neurological and psychiatric sequelae of COVID-19 need to be carefully tracked" (2021). An international consortium guided by WHO is

DRAFT

attempting to determine these long-term neurodegenerative consequences more definitively, with follow up studies ending in 2022 (de Erausquin et al., 2021).

In the short term, a number of studies have already demonstrated the potential mental health effects caused by COVID-19. In the UK database mentioned above, 21 COVID-19 patients had new psychiatric diagnoses, including 10 who became psychotic and others with dementia-like symptoms or depression (Varatharaj et al., June 25, 2020). An Italian study screened 402 adults for psychiatric symptoms with clinical interviews and self-report questionnaires at one month follow-up after hospital treatment. Patients rated in the psychopathological range as follows: 28% for post-traumatic stress disorder (PTSD), 31% for depression, 42% for anxiety, 20% for obsessive-compulsive symptoms, and 40% for insomnia. Overall, 56% scored in the pathological range in at least one clinical dimension (Mazza et al., July 30, 2020). The TriNetX analytics network was used to capture de-identified data from electronic health records of a total of 69.8 million patients from 54 healthcare organizations in the United States (Taquet et al., November 9, 2020). Of those patients, 62,354 adults were diagnosed with COVID-19 between January 20 and August 1, 2020. Within 14 to 90 days after being diagnosed with COVID-19, 5.8% of those patients received a first recorded diagnosis of psychiatric illness, which was measured as significantly greater than psychiatric onset incidence during the same time period after diagnoses of other medical issues including influenza (2.8%), other respiratory diseases (3.4%), skin infections (3.3%), cholelithiasis (3.2%), urolithiasis (2.5%), and fractures (2.5%). At the NIAID Workshop on Post-Acute Sequelae of COVID-19, medical personnel discussed their experiences treating COVID-19 patients in the Johns Hopkins Post-Acute COVID-19 Team (PACT) Clinic. Among 49 patients in the Clinic, more than 50% had some form of cognitive impairment 3 months after acute illness (Parker, December 3, 2020).

DRAFT

Both ICU and non-ICU patients were affected, but impairment was more pronounced in ICU survivors (Parker, December 3, 2020). The medical personnel also reported mental health impairments among patients treated at the PACT Clinic.

The studies and evidence discussed above give some indication of the many serious long-term health effects COVID-19 patients might experience, including respiratory, cardiovascular, neurological, and psychiatric complications. However, the full extent of the long-term health consequences of COVID-19 is unknown because the virus has only been transmitted between humans since the end of 2019. Therefore, to fully appreciate the likely long-term risks to individuals with COVID-19, it is important to consider the long-term impacts of similar coronaviruses found among human populations where there has been more time to gather data. The previous SARS outbreak in 2002 to 2003, caused by the SARS-CoV-1 virus, is one such example, and it indicates long-term impacts to infection survivors, which might result from the viral infection, medications used, or a combination of those factors. Patients who survived a SARS-CoV-1 infection report that they have a reduced quality of life at least 6 months after illness (Hui et al., 2005). These patients were found to have reduced exercise capacity; some had abnormal chest radiographs and lung function, and weak respiratory muscles at least 6 months after illness (Hui et al., 2005). Survivors reported experiencing depression, insomnia, anxiety, PTSD, chronic fatigue, and decreased lung capacity with patient follow up as long as four years after infection (Lam et al., December 14, 2009; Lee et al., April 2007; Hui et al., 2005). Long term studies have revealed that some survivors of SARS-CoV-1 infections have chronic pulmonary and skeletal damage after a 15 year follow up (Zhang et al., February 14, 2020). Zhang et al. found that approximately half of the area of ground glass opacities present after infection in a 2003 CT scan (9.4%) remained after 15 years (4.6%). The study also found

DRAFT

significant femoral head loss (25.52%) remained in 2018. Bone loss was likely an indirect effect caused by the high pulse steroid therapies used to treat the infection in many patients with severe disease. Survivors also suffer long-term neurologic complications, deficits in cognitive function, musculoskeletal pain, fatigue, depression, and disordered sleep up to at least three years after infection (Moldofsky and Patcai, March 24, 2011).

*Individuals at Increased Risk from COVID-19*

Many members of the workforce are at increased risk of death and severe disease from COVID-19 because of their age or pre-existing health conditions. "Comorbidities" are fairly common among adults of working age in the U.S. For instance, 46.1% of individuals with cancer are in the 20-64 year old age range (NCI, April 29, 2015), and over 40% of working age adults are obese (Hales et al., February 2020). Furthermore, over a quarter of those between 65 and 74 years old remain in the workforce, as well as almost 10% of those 75 and older (BLS, May 29, 2019). Individuals who are at increased risk of severe infection (hospitalization, admission to the ICU, or death) include: individuals who have cancer, chronic kidney disease, chronic obstructive pulmonary disease, Down Syndrome, serious heart conditions, obesity, pregnancy, sickle cell disease, type 2 diabetes, and individuals who are over 65 years of age, immunocompromised and/or smokers (CDC, February 22, 2021). Of 5,700 COVID-19 patients hospitalized from March 1 to April 4, 2020 in the New York City area, the most common comorbidities were hypertension (56.6%), obesity (41.7%), and diabetes (33.8%), excluding age (Richardson et al., April 22, 2020).

*Observed Disparities in Risk Based on Race and Ethnicity*

During the COVID-19 pandemic, research has found that employees in racial and ethnic minority groups, and especially Black and Latinx employees, have often faced substantially

DRAFT

higher risks of SARS-CoV-2 exposure and infection through the workplace than have white employees (Hawkins, June 15, 2020; Hertel-Fernandez et al., June 2020; Roberts et al., September, 2020; Rubenstein, December 18, 2020; Waltenburg et al., January 2021). Among the general population of the U.S., American Indian, Alaskan Native, Latinx, and Black populations are more likely than white populations to be infected with SARS-CoV-2 (CDC, February 12, 2021b). Once infected, people in these demographics are also more likely than their white counterparts to be hospitalized for and/or die from COVID-19 (CDC, February 12, 2021b). Asian populations in the United States are overall less likely than white populations to be infected, but suffer more serious health outcomes when infected (CDC, February 12, 2021b). These observed disparities in risk of infection, risk of adverse health consequences, and risk of death are attributable to a number of factors, including that people from racial and ethnic minority groups are often disproportionately represented in essential frontline occupations that require close contact with the public and that offer limited ability to work from home or take paid sick days. Disease severity is also likely exacerbated by long-standing healthcare inequities (CDC, February 12, 2021c).

Hawkins (June 15, 2020) compared data on worker demographics from the Bureau of Labor Statistics' 2019 Current Population Survey and O*NET (a Department of Labor database that contains detailed occupational information on the nature of work for more than 900 occupations across the U.S.) to determine occupation-specific COVID-19 risks. The model found that among O*NET's 57 physical and social factors related to work, the two predictive variables of COVID-19 risk were frequency of exposure to diseases and physical proximity to other people. The author found that Black individuals were overwhelmingly employed in essential industries and that people of color—which in this study included Black, Asian, and Hispanic

DRAFT

populations—were more likely than white individuals to work in essential occupations that were identified as having greater disease exposure risk characteristics. A similar evaluation of workers employed in several frontline industries (e.g., grocery, transportation, warehouse work, cleaning, healthcare, child care) found that people of color—defined in this study to include individuals who are Black, Hispanic, Asian-American/Pacific Islander, or some category other than white—are more likely to perform these types of work (Rho et al., April 2020). The study found that Black workers are 43% more likely to have a frontline occupation, primarily in public transit and child care, than would be expected given their workforce proportion. Latinx workers make up a significant portion of cleaning service and trucking/warehouse/postal service positions. And Asian American and Pacific Islander workers have high employment in healthcare. These studies demonstrate that people in racial and ethnic minority groups are disproportionately represented among the American workforce in jobs associated with greater risk of exposure to SARS-CoV-2.

Through January 2021, infection rates in the United States are 10-90% greater for American Indian, Alaskan Native, Latinx, and Black populations than for white populations (CDC, February 12, 2021b). This disparity is also reflected in studies addressing infections by occupation, race, and ethnicity. In a study from early in the pandemic that evaluated outbreaks in Utah across 15 comprehensive industry categories, Bui et al. (August 17, 2020) compared SARS-CoV-2 infections associated with a workplace outbreak to infections associated with other settings within different demographic groups and found that infections in certain racial and ethnic groups were more likely to occur from a workplace outbreak than in other settings. For example, the study found that 56.4% of workplace-associated infections were among Latinx workers, whereas only 39.8% of infections in other settings were among Latinx individuals, meaning the rate of infection for Latinx workers was 42% greater in the workplace than in other

DRAFT

settings. The study also foud that, in total, 970 (73%) of persons with workplace outbreak-associated COVID-19 identified as Hispanic or nonwhite, although these ethnic/racial groups represent less than 24% of Utah's workforce in the 15 affected industry sectors. This disparity was observed across all 15 industry sectors. A geographically more expansive look into food processing, food manufacturing, and agriculture found that 72.8% of infections were found in Latinx employees even though they only made up 36.5% of the workforce in the study (Waltenburg et al., January 2021). Similar disparities were found for Black and Asian American Pacific Islander employee populations, but not for the white employee population. The researchers suggested that high infection rates could be due to working in high-density environments. In a large study of healthcare employees in Los Angeles, researchers found that increased risk of infection was significantly related to whether an employee was Latinx or Black (Ebinger et al., February 12, 2021). Another study of frontline healthcare workers in the U.S. and UK found that Black, Asian, and minority ethnic workers were more likely to report a positive COVID-19 test than non-Hispanic, white workers (Nguyen et al., 2020). The study also found that Black, Asian, and minority ethnic healthcare workers were more likely to report reuse of or inadequate PPE, were more likely to work in higher-risk clinical settings (e.g., in-patient hospitals or nursing homes), and were more likely to care for patients with suspected or documented COVID-19. These studies illustrate that racial and ethnic minorities are likely to be at increased risk of acquiring occupational SARS-CoV-2 infections.

In addition to an increased likelihood of infection, Native American, Alaskan Native, Asian, Latinx, and Black populations all have increased risk of hospitalization and/or death from COVID-19 in comparison to white populations (CDC, February 12, 2021b). Chen et al. (2021) studied increased mortality risk between different racial and ethnic minority groups and

DRAFT

occupations for working age Californians in pre-pandemic and pandemic time frames. Measured mortality risks increased during the pandemic for all races and ethnicities, but white populations had lower increased risk (6% increase) compared to Asian populations (18%), Black populations (28%) and Latinx populations (36%). A similar disparity in excess mortality was also observed between races and ethnicities within the same occupational sector (Chen et al., January 22, 2021). Herstein et al. (April 2021) investigated SARS-CoV-2 transmission and health outcomes in meat processing workers in Nebraska. The researchers found that not only did Latinx workers represent a majority of those infected (67%), but they were also at increased risk of hospitalization (73%), admittance into the ICU (78%), and death (86%).

Health equity is a major concern in assessing the pandemic's effects (CDC, February 12, 2021c). Some of the factors that contribute to increased risk of getting sick and dying from COVID-19 include: discrimination, healthcare access/utilization, economic issues, and housing (CDC, February 12, 2021b). And although racial and ethnic minority groups are more likely to be exposed to and infected with SARS-CoV-2, research indicates that testing for the virus is not markedly higher for these demographic groups (Rubin-Miller et al., September 16, 2020). Rubin-Miller et al. note that there may be barriers to testing that decrease access or delay testing to a greater degree than in white populations. These barriers to testing can delay needed medical care and lead to worse outcomes. And even when able to seek care, other barriers may exist. For example, Pasco et al. (October 29, 2020) evaluated COVID-19 risk in the construction industry in Austin, TX and found that Latinx employees are at an increased risk of adverse health outcomes, compounded by the fact that roughly half of those workers lack health insurance. Similar issues are found among healthcare workers where, out of 3.66 million workers with co-morbidities (e.g., age, chronic conditions), 7.5% are uninsured and 30.5% lack paid sick leave

DRAFT

(Himmelstein and Woolhandler, September 2020). In discussing widespread health inequities, studies have noted that American Indian communities lack sufficient facilities to respond to COVID-19 (Hatcher et al., August 28, 2020; van Dorn et al., April 18, 2020). Immigrant communities whose individuals contribute greatly to essential industries are also at risk of receiving delayed healthcare services (Clark et al., July 13, 2020).

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DRAFT

**b. Transmission of SARS-CoV-2**

SARS-CoV-2 is a highly transmissible virus. In just over a year, it has spread to over 28 million people in the U.S., affecting every state, and it continues to spread. In just one week,

from January 17 to January 23, 2021, *1 in 265 of all people in the U.S.* became newly infected (CDC, February 23, 2021; Census Bureau, June 25, 2020). According to the CDC, the primary way the SARS-CoV-2 virus spreads from an infected person to others is through the respiratory droplets that are produced when an infected person coughs, sneezes, sings, talks, or breathes (CDC, December 31, 2020). Infection could then occur when another person breathes in the virus. Most commonly this occurs when people are in close contact with one another (within approximately six feet) (CDC, December 31, 2020).

The best available current scientific evidence demonstrates that the farther a person is away from the source of the respiratory droplets, the fewer infectious viral particles will reach that person's eyes, nose, or mouth because gravity pulls the droplets to the ground (see the *Need for Specific Provisions*, Section V of the preamble, on Physical Distancing). For example, a systematic review of SARS-CoV-2 (up to early May 2020) and similar coronaviruses (i.e., SARS-CoV-1 (a viral strain related to SARS-CoV-2) and Middle Eastern Respiratory Syndrome (MERS) (a disease caused by a virus that is similar to SARS-CoV-2 and spreads through droplet transmission)) found 38 studies, containing 18,518 individuals, to use in a meta-analysis that found that the risk of viral infection decreased significantly as distance increased (Chu et al., June 1, 2020). A second COVID-19 study from Thailand reviewed physical distancing information collected from 1,006 individuals who had an exposure to infected individuals (Doung-ngern et al., September 14, 2020). The study revealed that the group with direct physical contact and the group within one meter but without physical contact were equally likely to become infected with SARS-CoV-2. However, the group that remained more than one meter away had an 85% lower infection risk than the other two groups. The studies' findings on

DRAFT

physical distancing combined with expert opinion firmly establish the importance of droplet transmission as a driver of SARS-CoV-2 infections and COVID-19 disease.

COVID-19 may also be spread through airborne particles under certain conditions (Schoen, May 2020; CDC, October 5, 2020; Honein et al., December 11, 2020). That airborne transmission can occur during aerosol-generating procedures (AGPs) in healthcare (such as when intubating an infected patient) is well-accepted (see CDC, March 12, 2020). CDC provides recommendations for infection prevention and control practices when caring for a patient with suspected or confirmed SARS-CoV-2 infection that include the use of a respirator (CDC, February 23, 2021b). There are several studies examining the risks associated with AGP. For example, a publication detailing one of the first known SARS-CoV-2 occupational transmission events in U.S. healthcare providers reported a statistically significant increased risk from AGPs (Heinzerling et al., April 17, 2020). Moreover, data from the Respiratory Protection Effectiveness Trial (ResPECT), designed to assess effectiveness of PPE to prevent respiratory infections, were analyzed to identify risk factors for endemic coronavirus infections among healthcare personnel (Cummings et al., July 9, 2020). This study found that AGPs doubled the risk of infection among healthcare providers. Although the infectious agents studied were common coronaviruses and not the SARS-CoV-2 virus, the study clearly indicates increased risk from such procedures for infections from the coronavirus family, and thus the study is relevant. In addition, a systematic review of research on transmission of acute respiratory infections from patients to healthcare employees focused on publications from the first SARS virus outbreak (Tran et al., April 26, 2012). Risks of infection in those performing AGPs were several times higher than in healthcare workers not exposed to AGPs. Workers may also be exposed to the SARS-CoV-2 virus during AGPs conducted outside of the hospital setting,

DRAFT

including certain dental surgical procedures (Leong et al., December 2020), cardiopulmonary resuscitation (CPR) provided by homecare workers (Payne and Peache, February 4, 2021), and endoscopy (Teng et al., September 16, 2020; Sagami et al., January 2021).

Risk from AGPs during autopsies is evident from reports of staff infections during autopsies on decedents infected with tuberculosis, which is a well-known airborne infectious agent (Nolte et al., December 14, 2020). Additionally, research that measured airborne particles released during the use of an oscillating saw with variable saw blade frequencies and different saw blade contact loads concluded that, even in the best-case scenario tested on dry bone, the number of aerosol particles produced was still high enough to provide a potential health risk to forensic practitioners (Pluim et al., June 6, 2018). Other reports from healthcare settings have raised the possibility of spread of airborne particles from suspected or confirmed COVID-19 patients even absent the use of AGPs. For example, infectious viral particles were collected from in the room of a COVID-19 patient from distances as far as 4.8 meters away in non-AGP hospital settings (Lednicky et al., November 1, 2020), and transmission via aerosol was suspected in a Massachusetts hospital (Klompas et al., February 9, 2021). For more discussion of this subject, see the *Need for Specific Provisions* (Section V of the preamble) on Respirators.

DRAFT

The extent to which COVID-19 may spread through airborne particles in other contexts is less clear. CDC has noted that in some circumstances airborne particles can remain suspended in the air and be breathed in by others, and travel distances beyond 6 feet (for example, during choir practice, in restaurants, or in fitness classes):

> There are several well-documented examples in which SARS-CoV-2 appears to have been transmitted over long distances or times. These transmission events appear uncommon and have typically involved the presence of an infectious person producing

> respiratory droplets for an extended time (>30 minutes to multiple hours) in an enclosed space. Enough virus was present in the space to cause infections in people who were more than 6 feet away or who passed through that space soon after the infectious person had left.

(CDC, October 5, 2020).

In general, enclosed environments, particularly those without good ventilation, increase the risk of airborne transmission (CDC, December 31, 2020; Tang et al., August 7, 2020; Fennelly, July 24, 2020). In one scientific brief, CDC provides a basic overview of how airborne transmission occurs in indoor spaces without adequate ventilation. Once respiratory droplets are exhaled, CDC explains, they move outward from the source and their concentration decreases through fallout from the air (largest droplets first, smaller later) combined with dilution of the remaining smaller droplets and particles into the growing volume of air they encounter (CDC, October 5, 2020). Without adequate ventilation, continued exhalation can cause the amount of infectious smaller droplets and particles produced by people with COVID-19 to become concentrated enough in the air to spread the virus to other people (CDC, October 5, 2020). For example, an investigation of a cluster of cases among meat processing employees in Germany found that inadequate ventilation within the facility, including low air exchange rates and constant air recirculation, was one key factor that led to transmission of SARS-CoV-2 within the workplace (Gunther et al., October 27, 2020). An epidemiological investigation of a cluster of COVID-19 cases in an indoor athletic court in Slovenia demonstrated that the humid and warm environment of the setting, combined with the turbulent air flow that resulted from the physical activity of the players, allowed COVID-19 particles to remain suspended in the air for hours (Brlek et al., June 16, 2020). A cluster of cases in a restaurant in China also suggested

DRAFT

transmission of SARS-CoV-2 via airborne particles because of little mixing of air throughout the restaurant (Li et al., November 3, 2020). Infections have been observed with as little as five minutes of exposure in an enclosed room (Kwon et al., November 23, 2020). Outdoor settings (i.e., open air or structures with one wall) typically have a lower risk of transmission (Bulfone et al., November 29, 2020), which is likely due to increased ventilation with fresh air and a greater ability to maintain physical distancing. For more discussion of this subject, see the *Need for Specific Provisions* (Section V of the preamble) on Ventilation.

Although the risk is generally considered to be low, the SARS-CoV-2 virus may also cause infection if an individual touches a surface that has the virus on it and then touches their own mouth, nose, or eyes (CDC, December 31, 2020). Infectious droplets produced by an infected person can land on and contaminate surfaces, and then contaminate the hands of another person who touches those surfaces. The hands of a person who has COVID-19 can become contaminated with the virus when the person touches their face, blows their nose, coughs, or sneezes. The virus can then spread to another person through direct contact (e.g., a handshake, hug). Studies show that the virus can remain viable on surfaces for hours to days (Riddell et al., October 7, 2020; van Doremalen, April 16, 2020). In recognition of the potential for contact transmission, CDC recommends cleaning, hand hygiene, and, under certain circumstances, disinfection for helping to prevent transmission of SARS-CoV-2 (CDC, February 25a, 2021; CDC, May 17, 2020; CDC, April 5, 2021). These are long established recommendations to prevent the transmission of viruses that cause respiratory illnesses (Siegel et al., 2007), such as SARS-CoV-1, another coronavirus that is similar to SARS-CoV-2. The potential for contact transmission was demonstrated in one study that reviewed cleaning and disinfection in households (Wang et al., May 11, 2020). The study found that the transmission of SARS-CoV-2

DRAFT

to family members was 77% lower when chlorine- or ethanol-based disinfectants were used on a daily basis compared to use only once in two or more days, irrespective of other protective measures taken such as mask wearing and physical distancing. For more discussion of this subject, see the *Need for Specific Provisions* (Section V of the preamble) on Cleaning and Disinfection.

These methods of transmission are not mutually exclusive, and each can present a risk to employees in various work environments. For instance, the CDC notes that a 'close contact' refers to transmission that can happen by either contact or droplet transmission while a person is within about 6 feet of an infected person (CDC, October 5, 2020). Based on these methods of transmission, there are a number of factors—often present in workplaces—that can increase the risk of transmission: indoor settings, prolonged exposure to respiratory particles, and lack of proper ventilation (CDC, October 5, 2020). First, and most significantly, workplaces are commonly indoor settings where people are in close contact with others. Employees are often in these locations for prolonged periods of time over the course of the day. Furthermore, workspaces are typically not designed for physical distancing; nor are they ventilated adequately to minimize infections. And in many workplaces employees frequently touch shared surfaces and use shared tools. Even in workplaces where employees have their own offices or equipment, they often share a number of common spaces with other workers, including bathrooms, break rooms, and elevators. Based on these characteristics, SARS-CoV-2 appears to be highly transmissible in work environments, a conclusion supported by existing data. COVID-19 incident rates have increased significantly for adults of working age as the pandemic has progressed in comparison with other age groups, with researchers noting that occupational status might be a driver (Boehmer et al., September 23, 2020).

DRAFT

Given the high transmissibility expected in work environments, the risk that employees face of exposure to SARS-CoV-2 is unacceptably high, even though it is related to some extent to population prevalence. As explained below, current data indicates that viral prevalence in the population is based on a number of factors, including the virus's existing reproductive number, the prevalence of pre-symptomatic and asymptomatic transmission, and the recent documentation of mutations of the virus that appear to be more infectious.

The transmissibility of viruses is measured in part by their reproductive number or "R0." This number represents the number of subsequently-infected people (or secondary cases) that are expected to occur from each existing case. Thus, an R0 of "1" indicates that every one case of infection will lead to one additional case. As long as a virus has an R0 of more than 1, it is expected to continue to spread throughout the population. The observed R0 (also known as simply R) must be below 1 to prevent sustained spread; such a reduction can be achieved through infection control interventions (e.g., vaccination, non-pharmaceutical interventions) that reduce the susceptibility of the population to the virus (Delamater et al., 2019). During the early part of the COVID-19 outbreak in China, before consistent protective measures were put into place, the R0 for SARS-CoV-2 was estimated as 2.2 (Riou and Althaus, January 30, 2020). Higher estimates of the R0 early in China (5.7) have also been published (Sanche et al., April 7, 2020). R0 ranges from 2 to 5 have been published for earlier MERS and SARS-CoV-1 coronavirus outbreaks (WHO, May 2003; Choi et al., September 25, 2017). Since the start of the COVID-19 pandemic, the R0 has varied depending on the natural ebb and flow of rolling infection surges as well as the fluctuating non-pharmaceutical interventions (NPIs) put in place, such as face coverings, nonessential business shutdowns, and testing with follow-up isolation and quarantining. The R0 value in the U.S. early in the pandemic was estimated to be approximately

DRAFT

2 (Li et al., October 22, 2020), and this value has generally remained above 1 for the country as a whole throughout the pandemic, with various states well above and below this value at various times (Harvard Chan School of Public Health, February 26, 2021).

Pre-symptomatic and asymptomatic transmission are significant drivers of the continued spread of COVID-19 (Johansson et al., January 7, 2021). Individuals are considered most infectious in the 48 hours before experiencing symptoms and during the first few symptomatic days (Cevik et al., November 19, 2020). The time it takes for a person to be infected and then transmit the virus to another individual is called the serial interval. Several studies have indicated that the serial interval for COVID-19 is shorter than the time for symptoms to develop, meaning that many individuals can transmit SARS-CoV-2 before they begin to feel ill (Nishiura et al., March 4, 2020; Tindale et al., June 22, 2020). It is also possible for individuals to be infected and subsequently transmit the virus without ever exhibiting symptoms. This is called asymptomatic transmission. As noted earlier, a recent meta-analysis reviewed 13 studies in which the asymptomatic prevalence ranged from 4% to up to 41% (Byambasuren et al., December 11, 2020).

The existence of both pre-symptomatic transmission and asymptomatic infection and transmission pose serious challenges to containing the spread of the virus. Although the risk of asymptomatic transmission is 42% lower than from symptomatic COVID-19 patients (Byambasuren et al., December 11, 2020), asymptomatic transmission might actually result in more transmissions than symptomatic cases because asymptomatic persons are less likely to be aware of their infection and can unknowingly continue to spread the disease to others. Similarly, pre-symptomatic individuals can transmit the virus to others before they know they are sick and should isolate. Existing evidence demonstrates that such transmission is a significant contributor

DRAFT

to the spread of COVID-19 in the United States. Johansson et al. (January 7, 2021) conducted a study to assess the proportion of SARS-CoV-2 transmission from pre-symptomatic, never symptomatic, and symptomatic individuals in the community. Based on their modeling, they found 59% of transmission came from asymptomatic transmission, including 35% from pre-symptomatic individuals and 24% from individuals who never develop symptoms (Johansson et al., January 7, 2021).

Finally, mutations in the SARS-CoV-2 virus have occurred over time, with at least three separate significant mutations originating in the UK, South Africa, and Brazil currently being tracked worldwide, all of which have now been documented in the United States. Reports from the UK indicate that the mutation there, called "B.1.1.7," is more infectious, adding 0.4 to 0.7 to the R0 value for the previous SARS-CoV-2 virus, increasing the reproductive number from 1.1 to as much as 1.8 (Volz et al., December 31, 2020). This occurred even with NPIs in place during the UK's November shutdown. As of February 14, 2021, this highly-transmissible variant of SARS-CoV-2 had been detected in 45 U.S. states (CDC, February 25b, 2021). Study modeling data indicate that B.1.1.7 has the potential to increase the U.S. pandemic trajectory in the coming months with a doubling rate of 9.8 days (Galloway et al., January 22, 2021; Washington et al., February 7, 2021). By February 14, 2021, both of the other variants of concern originally documented in South Africa (called "B.1.351") and in Brazil (called "P.1") had been detected in the U.S. in 15 and five states, respectively (CDC, February 25b, 2021). On January 25, 2021, the Minnesota Department of Health (MDH) announced that the state Public Health Laboratory found the Brazil P.1 variant in a specimen from a Minnesota resident with recent travel history to Brazil (MDH, January 25, 2021; Firestone MJ et al., March 3, 2021). This was the first documented case of the variant in the United States. On January 28, 2021, the South

DRAFT

Carolina Department of Health and Environmental Control announced that they had detected the nation's first case of the South African B.1.351 variant (SC DHEC, January 28, 2021). Current evidence illustrates that some of these mutations can increase transmissibility, spreading more easily and quickly than the non-mutated virus. If that occurs, it would likely lead to higher numbers of infections, hospitalization, and deaths (Galloway et al., January 22, 2021). One researcher has in fact hypothesized that one or more of these three mutations could soon become the dominant form(s) of COVID-19 in the United States (*Id.*) There is also evidence that these mutations can impact the effectiveness of medical countermeasures, including therapeutics such as monoclonal antibody treatments, and currently authorized COVID-19 vaccines.

Notably, antibody data indicates that even the extraordinrily high numbers of COVID-19 cases in the U.S. that have been measured by positive tests for acute infection are likely a serious underestimate of the total infections. Serological tests measure antibodies in the blood. A person who is infected by a virus will form antibodies as a result, and these antibodies can be detected in blood for a longer period than the virus can be detected from a COVID-19 infections, as they may be able to measure infections for individuals who never sought out a viral test. A recent U.S. study of antibody data estimated actual infection in the United States was 3 times higher than the number of diagnosed cases by the fall of 2020 (Angulo et al., January 5, 2021).

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**c. Immunity and Vaccination Have Not Eliminated the Grave Danger**

The development of safe and highly effective vaccines is an encouraging milestone in the nation's response to COVID-19, but OSHA does not believe that the grave danger to employees has been eliminated at the current time. While FDA has issued emergency use authorizations for three vaccines based on studies of tens of thousands of study participants clearly showing that they meet required standards for safety, effectiveness and manufacturing, the virus is novel, only having emerged in late 2019. Additional data that will be generated from further follow-up of participants in clinical studies of the vaccines and duration of immunity gained either through infection or through vaccination is not yet fully understood. Additionally, wide-scale inoculation of the general U.S. population is still some time away. Finally, another concern is that viruses continue to mutate over time—as we are just beginning to see with SARS-CoV-2—which can cause resistance to immunity developed from previous illness and may impact the performance of existing vaccines.

As an initial matter, little is known about what immunity is conveyed to individuals who have recovered from COVID-19. With most coronaviruses, recovery confers a degree of immunity to reinfection, and SARS-CoV-2 appears to follow that trend. However, there is documented evidence of reinfection with SARS-CoV-2, which demonstrates that such immunity is not universal and can potentially wane with time (FDA, December 11, 2020). Furthermore, given the nascency of the SARS-CoV-2 virus, it is difficult to know how long any immunity conveyed from infections might last, (CDC, February 22, 2021). In addition, the emergence of virus mutations that are more transmissible has increased concern regarding reinfections,

DRAFT

although data to address this are limited. In Manaus, Brazil, COVID-19 spread nearly unmitigated through the city last year, with an estimated 76% of the population infected (Buss et al., January 15, 2021). However, a larger second surge began in December 2020 and there is concern that a significant number of previously-infected persons are becoming infected again with the new variant of SARS-CoV-2, P.1, that is resistant to antibodies developed from the previous illness (Kupferschmidt, January 22, 2021). More studies need to be done to evaluate P.1 and other variants because infections were not uniform across demographics (Buss et al., January 15, 2021).

Despite this, the recent development and FDA Emergency Use Authorization (EUA) of COVID-19 vaccines is a promising advancement. Vaccines help protect recipients by creating an immune system response without recipients having to experience sickness (and possible serious, life-threatening complications). However, the existence of COVID-19 vaccines still does not eliminate the grave danger to employees, particularly in the time frame during which this ETS will be in effect. CDC recommends that those vaccinated should continue wearing face coverings in public, practicing physical distancing, avoiding crowds, avoiding poorly ventilated spaces, and practicing hand hygiene (CDC, March 9, 2021). Importantly, this guidance does not relax standards at the workplace. Dr. Anthony Fauci, the Director of NIAID, noted that recommendations to practice some of these public health measures may persist into 2022 (Thebault, February 21, 2021). And Dr. Rochelle Walensky, Director of the CDC, has stated repeatedly that "Despite the good news on the vaccination front, we simply cannot yet afford to relax the prevention strategies. We must continue the practice of mitigation strategies we know work, like wearing a mask and physical distancing, in order to slow the spread of COVID-19 and to see the end of this pandemic." (White House, April 2, 2021).

DRAFT

There are currently three vaccines for the prevention of COVID-19 that have received EUAs from the FDA, allowing for their distribution in the U.S.: the Pfizer-BioNTech COVID-19 Vaccine, the Moderna COVID-19 Vaccine, and the Janssen COVID-19 Vaccine The EUAs were issued in December 2020 and February 2021, and one day after each EUA was issued, CDC, after receiving advice from the Advisory Committee on Immunization Practices (ACIP), recommended use of each vaccine in persons aged at least 16 or 18 years of age depending on the specific vaccine (Oliver et al., December 13, 2020; Oliver et al., December 20, 2020; Oliver et al., March 2, 2021). According to available data, the vaccines were shown to be 95%, 94%, and 67% effective, respectively, in preventing COVID-19 in clinical trial participants (FDA, December 11, 2020; FDA, December 18, 2020; FDA, February 27, 2021). Additionally, the Janssen COVID-19 Vaccine was approximately 77% effective in preventing severe/critical COVID-19 occurring at least 14 days after vaccination and 85% effective in preventing severe/critical COVID-19 occurring at least 28 days after vaccination. The effectiveness of these three vaccines according to available data illustrates that population-scale vaccination is an impressive tool to prevent COVID-19 and related serious COVID outcomes, hospitalization, and death. However, while these vaccines are effective in preventing and reducing the severity of symptomatic disease, they do not entirely prevent infection after vaccination (Teran, April 21, 2021; Polack et al., December 31, 2020; Budryk, February 21, 2021; Zimmer et al., February 24, 2021). Thus, even for those who do receive a COVID-19 vaccine, some risk of infection remains.

Although COVID-19 vaccines are authorized to prevent COVID-19, the reduction of disease is not yet significant enough to eliminate the grave danger the SARS-CoV-2 virus causes, and vaccine uptake is not yet widespread enough to result in widespread immunity.

DRAFT

Based on their phase 3 trials, the Pfizer-BioNTech, Moderna, and Janssen COVID-19 vaccines have been shown to be effective in preventing severe disease as soon as 14 days after the first dose (FDA, December 11, 2020; FDA, December 18, 2020). However, two vaccines require two separate doses (three weeks apart for the Pfizer-BioNTech COVID-19 Vaccine; four weeks apart for the Moderna COVID-19 Vaccine) in order to complete the vaccination series. If it is not feasible to adhere to the recommended interval, the second dose of both the Pfizer-BioNTech and Moderna COVID-19 vaccines can be administered up to six weeks after the first dose when necessary. There are limited data on the efficacy of these vaccines when they are administered beyond this window (CDC, February 10, 2021).

Further, the immune system needs time to fully respond after vaccination, so CDC does not consider someone "fully vaccinated" until two weeks after their final dose (CDC, February 10, 2021). Consequently, individuals who receive the one-dose Janssen Vaccine are not considered "fully vaccinated" until two weeks after their vaccine administration (CDC, March 9, 2021), and individuals receiving the two-dose Pfizer-BioNTech and Moderna Vaccines are not considered fully vaccinated until two weeks after their second dose, which is at least five to six weeks after the initial dose (CDC, February 10, 2021). And even though there may be sufficient vaccine supply for the entire U.S. population, distributing and administering the vaccine throughout the country will still take more time. As of April 21, 2021, CDC statistics show that just 25% of the population between 18 and 65 has been fully vaccinated (CDC, April 21, 2021).

In addition, there is still a need to strengthen confidence in the safety and effectiveness of the vaccines for significant portions of the population, including workers. Even in the healthcare industry, where entire worker populations could have been vaccinated by now, some workplaces are not vaccinated at sufficient levels. In February of 2021, the CDC released a study of initial

DRAFT

vaccine efforts at skilled nursing facilities offering long-term care (Gharpure et al., February 5, 2021). The study found that over 60% of the employees eligible to receive a vaccine *refused* to be vaccinated when offered the opportunity (as opposed to only 22% of residents at those facilities who refused), maintaining a potentially significant population vulnerable to SARS-CoV-2 infections and capable of transmission.

An anonymous survey of employees across the Yale Medicine and Yale New Haven Health system was used to estimate the prevalence of and underlying reasons for COVID-19 vaccine hesitancy. The survey was sent to about 33,000 employees and medical staff across the Yale healthcare system, and included clinical staff and those who support the critical infrastructure without direct patient contact (e.g., food service staff). Out of 3,523 responses (an 11% response rate), 85% of respondents stated they were "extremely likely" or "somewhat likely" to receive the COVID-19 vaccine. Of that 85%, 12% expressed mild hesitancy by stating they would get it within the next 6 months. But 14.7% of overall respondents expressed reluctance by responding "neither likely nor unlikely," "somewhat unlikely," or "extremely unlikely" to receive the COVID-19 vaccine. Overall, 1 in 6 personnel in this health system survey expressed at least some reluctance to get vaccinated (Roy et al., December 29, 2020). Findings in more recent surveys show similar rates of people who stated they would not, probably would not, or only if required get vaccinated in the general working population from 18-65 years old (11.6-21.9%, Census Bureau, April 14, 2021; 17-26%, KFF, April 22, 2021).

Even when people are willing to be vaccinated, the increasing emergence of SARS-CoV-2 virus mutations, as discussed above, has raised uncertainty associated with the variants' effects on vaccine efficacy and CDC is emphasizing the increased importance of rigorous compliance with public health mitigation strategies, such as physical distancing, use of masks, hand hygiene,

DRAFT

and isolation and quarantine, in addition to vaccination (Galloway et al., January 15, 2021). A study testing the Pfizer-BioNTech COVID-19 vaccine found that it was equally capable of neutralizing the notable variants from the United Kingdom and South Africa (Xie et al., February 8, 2021). There is considerable concern about the efficacy of the existing vaccines in relationship to evolving variants. CDC notes that the variants currently of concern are recognized by the immune response generated by the vaccines currently authorized by the FDA, but that the efficacy of the vaccines against these variants is being closely investigated (CDC, April 2, 2021). And there remains concern about new variants, because there is some evidence that virus-resistant variants are possible (Madhi et al., February 12, 2021; Johnson and Johnson, January 29, 2021). Vaccine manufacturers indicate that they intend to develop vaccines to address new strains, but that will require additional time and effort.

This uncertainty is emphasized by the fact that, in the spring of 2021, case rates are rising despite increasing rates of vaccination. The rate of new cases, hospitalizations and deaths all peaked in January 2021, just before vaccines became widely available outside of healthcare. The January to February decline, however, could not be attributed in large part to the new vaccines alone, because only a small portion of the population had received them. Even as the pace of vaccination has accelerated, the seven-day daily average number of new cases rose by 8.4% as reported on April 2, 2020 in comparison to the previous week (CDC, April 2, 2021). During this time the prevalence of the more transmissible variants increased from 3.1% to 44.1% of infections (CDC, April 16, 2021). Hospital admissions also rose, increasing by 4.8%. Because of the level of vaccinations among people over 65, there are fewer new infections among that population, which means there is an increase in hospitalizations among younger, working-age adults. The relative youth of the newly infected people is also a likely cause, along with

DRAFT

improved therapeutics, of the continued decline in death rates. Nonetheless, hundreds of people each day are still dying of COVID-19, indicating that the disease still presents a grave danger to working-age adults.

This evidence shows that COVID-19 still presents a grave danger, even for workplaces in which a high percentage of the workforce has been vaccinated. The evidence described above shows clearly that we are in a race between vaccines and more transmissible variants, and the best way we can help the vaccines win that race is to make sure Americans do not let up on the mitigation measures we know help reduce the spread of all variants. Dr. Walensky noted that reduced use of non-pharmaceutical interventions and the increased infections related to more transmissible variants "makes the race to stop the transmission even more challenging and threatens to overwhelm our healthcare system again in parts of this country" (Walensky, April 16, 2021). This ETS will help ensure we win that race by requiring the use of non-pharmaceutical interventions in workplaces. As President Biden warned recently, "let me be deadly earnest with you: We aren't at the finish line. We still have a lot of work to do. We're still in a life-and-death race against this virus. Until we get more people vaccinated, we need everyone to wash their hands, socially distance, and mask up in a recommended mask from the CDC." (President Joseph Biden, April 6, 2021). Those are precisely the measures required by this ETS.

This evidence has also led Dr. Rochelle Walensky, the director of the CDC, to describe "the recurring feeling I have of impending doom," comparing conditions in the U.S. at the end of March to those in several European countries before their recent COVID-19 spikes. But she then pointed out that same result here is not inevitable: "We are not powerless; we can change this trajectory of the pandemic. But it will take all of us, recommitting to following the public health

DRAFT

prevention strategies consistently, while we work to get the American public vaccinated" (Walensky, March 29, 2021).

This conclusion is similarly reflected across CDC guidance documents, one of which advises that COVID-19 vaccination is an important tool to help stop the pandemic, but that stopping a pandemic requires using all of the tools we have available (CDC, February 25, 2021). CDC's COVID-19 Vaccine Communication Toolkit emphasizes that people will still need to wear a mask and physically distance in public settings and at work after getting each shot of the vaccine (CDC, March 9, 2021). As experts learn more about the extent to which COVID-19 vaccination might help reduce spread of the disease, CDC will continue to use the latest science to update the recommendations for protecting communities (CDC, January 21, 2021), but at this point it is clear that the existence of safe and effective vaccines alone cannot address the grave danger of COVID-19.

This conclusion is further supported by a study from scientists at Columbia University. The scientists explained: "The coronavirus pandemic in the United States has raged almost uncontrollably for so long that even if millions of people are vaccinated, millions more will still be infected and become ill unless people continue to wear masks and maintain social distancing measures until midsummer [2021] or later" (Conlen et al., January 24, 2021). The models presented in the study show that vaccine rollout alone is not enough. Rather, based on the number of cases at the time of publication of this ETS, precautions like working remotely, limiting travel, and wearing face coverings need to be maintained for at least a significant portion of the period during which the ETS will be in effect. The researchers issued dire warnings about potential effects if the precautions are loosened too soon. Of course, all of these predictions are uncertain. Notably, on March 2, 2021, President Biden announced that current projections show

DRAFT

there should be enough vaccine supply for every adult in America by the end of May, and as of April 19, all adults are now eligible for the vaccine. This is good news, but there is significant uncertainty as to the trajectory of vaccine coverage. The number of doses administered appears to be declining (CDC, April 21, 2021) and there are concerns that surpluses of vaccine supplies are growing with significant parts of the population choosing not to be vaccinated or unable to make appointments (Edney and Armstrong, April 15, 2021).

If rapid spread of vaccination and other measures bring the virus under control within the period covered by the ETS, OSHA can modify or rescind the ETS or adjust its enforcement of this ETS. As noted above, a significant and sustained reduction in the current scale of transmission will need to occur before SARS-CoV-2 and the disease it causes, COVID-19, are no longer considered to be a grave danger.

In summary, OSHA does not believe that immunity through prior SARS-CoV-2 infection or through COVID-19 vaccination has yet eliminated the grave danger to employees. Although COVID-19 vaccines have the potential to limit the risk to employees, there is still meaningful uncertainty about the long-term efficacy of the vaccines and the ability of vaccination to prevent asymptomatic transmission to close contacts. Moreover, near-term factors such as limited access to the vaccine for some workers, and the need to build confidence in the vaccines among others will delay achieving the full potential of those vaccines. As noted above, there are already some parts of the country where vaccine supplies exceed demand as a significant portion of the remaining population may choose not to be vaccinated. The uncertainty about how these factors will affect transmission supports the likelihood that the grave danger of infection with SARS-CoV-2 will remain in workplaces for some time. Further, virus mutations have the potential to continue transmission and reduce vaccine effectiveness. However, OSHA will continue to

DRAFT

monitor these issues, and will evaluate the continued need for the ETS if conditions improve to the extent that COVID-19 no longer poses a grave danger to employees.

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### iii. Impact on the Workplace

As discussed above, the very nature of workplaces means that transmission of SARS-CoV-2 is likely to occur in those settings. SARS-CoV-2 readily transmits in workplaces where employees come into contact with co-workers, the public, delivery people, patients, long-term

DRAFT

care residents, or any other people who enter the workplace. Other factors characteristic of many workplaces, including interacting with people who are suspected or confirmed to have COVID-19, working in indoor settings, working in poorly-ventilated areas, and spending hours in close proximity with others, exacerbate this risk further. Although COVID-19 is not exclusively an occupational disease, it is evident from research accrued since the beginning of the pandemic that SARS-CoV-2 transmission can occur in workplaces, affecting employees and their lives, health, and livelihoods. This section describes some of the clusters, outbreaks, and other occurrences of workplace COVID-19 cases that researchers and journalists have described, and the widespread effects of SARS-CoV-2 in industry sectors across the national economy.

The workplace-based clusters provide evidence that workplaces in a wide range of industries have been affected by COVID-19, that many employees face exposure to infected people in their workspaces, and that it is likely that SARS-CoV-2 transmission is occurring in the workplace. However, the presence of a cluster on its own does not necessarily establish that the cluster was work-related (i.e., a result of transmission at the worksite). The basis for OSHA's grave danger finding is that employees can be exposed to the virus in almost any work setting and that even fairly relatively brief exposure (i.e. 15 minutes during a 24-hour period) can lead to infection, which in turn can cause death or serious impairment of health. The information described in this section supports OSHA's general finding that employees who work in spaces shared by others are at risk of exposure to SARS-CoV-2. The degree of risk from droplet-based transmission may vary based on the duration of close proximity to a person infected with COVID-19, but the simple and brief act of sneezing, coughing, talking, or even breathing can significantly increase the risk of transmission if those activities are not controlled at the source.

DRAFT

COVID-19 might also be spread through airborne particles under certain conditions, particularly in enclosed settings with inadequate ventilation.

The peer-reviewed scientific journal articles, government reports, and journal pre-print articles described below establish the widespread prevalence of COVID-19 among employees. OSHA's findings are based primarily on the evidence from peer-reviewed scientific journal articles and government reports. However, peer review for scientific journal articles and the assembly of information for government reports and other official sources of information take time, and therefore those sources do not always reflect the most up-to-date information (Chan et al, December 14, 2010). This is critical in the context of the COVID-19 pandemic, where new information is emerging daily. Therefore, OSHA has supplemented peer-reviewed data and government reports with additional information on occupational outbreaks contained in other sources of media (e.g., newspapers). The reported information from newspapers can provide further evidence of the impact of an emerging and changing disease, especially for industries that are not well represented in the peer-reviewed scientific literature, and assist OSHA in protecting employees from the grave danger posed by transmission of SARS-CoV-2 in workplaces. OSHA did not make findings based solely on non-peer-reviewed sources such as pre-prints and news articles, but the agency found that those sources sometimes provided useful information when considered in context with more robust sources. Together, these sources of information represent the best available evidence of the impact on employees of the pandemic thus far.

The peer-reviewed literature, government reports and, in a limited number of cases, non-peer-reviewed articles illustrate a significant number of infections among employees in a variety of industries, but the industries and types of workplaces described are not the only ones in which a grave danger exists. The science of transmission does not vary by industry, nor does the

DRAFT

severity of COVID-19 once an employee is infected; an employee exposed to SARS-CoV-2 might die whether exposed at a meat packing facility, a retail establishment, or an office.

The information on workplace frequency of COVID-19 cases is organized into several subsections. OSHA first presents general information that describes COVID-19 among employees in all occupational settings across the country. This section is followed by information on COVID-19 in specific industry sectors; the information is aligned with the sectors covered by the separate sections of the ETS. Thus, OSHA first describes the impact of COVID-19 on industry sectors covered by 29 CFR 1910.501, which applies to all employers other than those providing healthcare and healthcare support services. The next section addresses the impact on employees in healthcare and associated industries, who are covered by 29 CFR 1910.502. Together, this information illustrates the widespread nature of COVID-19 hazards at work, which are not confined to any particular type of workplace or employee but rather affect all employees who come into contact with other people as part of their jobs.

**a. General Impact on Workers**

The pandemic is still so new that there has not been time to gather significant workplace data across different industries regarding COVID-19 incidence at a national level. Community-wide occupational studies on COVID-19 incidence therefore provide key data and illustrate the potential for employee exposure to COVID-19 in locations around the country. The Washington State Department of Health and the Washington State Department of Labor and Industries collaborated on a report evaluating COVID-19 cases and their occupational history (WDH and WLNI, November 10, 2020). They identified 30,895 confirmed cases of COVID-19 in Washington State with occupational data, including both healthcare and non-healthcare employees, through September 13, 2020. They reported infection rates for 22 occupational

DRAFT

groups (WDH and WLNI, November 10, 2020). The report found infections across all sectors, with the highest incidence of infections in the following industry sectors: healthcare and social assistance; agriculture, forestry, fishing, and hunting; retail trade; manufacturing; accommodation and food services; construction; and public administration. The report states that some occupations increase the risk to workers of exposure to SARS-CoV-2, but the data does not demonstrate that all the cases reported resulted from occupational exposure.

These data were also used to determine how work activities were related to COVID-19. Zhang used information from a previous Washington State report with an earlier cutoff date (through June 11, 2020; 10,850 cases) and crossed it with information available from O*NET (a Department of Labor database that contains detailed occupational information for more than 900 occupations across the U.S.) to determine occupation-specific COVID-19 risks (Zhang, November 18, 2020). Zhang created a model using the O*NET descriptors and correlated it to the case reports from Washington State to develop a predictive model for COVID-19 cases. The model found that among O*NET's 57 physical and social factors related to work, the two predictive variables of COVID-19 risk were frequency of exposure to diseases and physical proximity to other people. This finding provides additional evidence that during an active pandemic, employees can be exposed to a grave danger during sustained periods in shared workspaces where they are working in proximity to others.

The Oregon Health Authority (OHA) publishes a weekly report detailing outbreaks directly related to work settings. OHA epidemiologists consider cases to be part of a workplace outbreak when clusters form with respect to space and time unless their investigation uncovers an alternative source for the outbreak. In their January 13, 2021, COVID-19 Weekly Report, OHA reported over 100 active workplace clusters (OHA, January 13, 2021). Throughout the

DRAFT

pandemic, OHS has reported workplace clusters in a wide variety of industries including correctional facilities, emergency services, waste management, schools and child care, retail stores, warehousing, groceries, agriculture, food processing, construction, healthcare, mail service, and others. OHA has reported a total of 15,275 cases and 71 deaths related to these workplace outbreaks.

In November 2020, the Nashville Metro Health Department also issued a COVID-19 report detailing workplace clusters from March 11 to November 13, 2020 where groups of cases were linked to a specific place and time (Nashville Metro Health Department, November 30, 2020). The report notes 200 COVID-19 clusters occurring under 18 settings, 16 of which were workplace settings. Settings with more than 5% of the total clusters were bars, commercial/warehouse facilities, congregate housing, construction, correctional facilities, day care centers, long-term care facilities, and schools. The largest reported cluster, resulting in 280 cases, was at Tyson Foods, a poultry processing plant. Similar reporting is available from Louisiana's Department of Health (January 13, 2021), with 696 outbreaks. Workplace settings in Louisiana that experienced more than 5% of outbreaks included bars, day care facilities, food processing establishments, industrial settings, office spaces, restaurants, and retail settings.

A study on SARS-CoV-2 testing in Los Angeles from mid-September through October 2020 evaluated 149,957 symptomatic and asymptomatic positive cases associated with an occupation (Allan-Blitz et al., December 11, 2020). The study found infections in all of the 14 employment designations. Rates were found to be particularly high for healthcare personnel, construction workers, correctional workers, first responders, grocery store workers, and food services workers.

DRAFT

Two Morbidity and Mortality Weekly Reports (MMWRs) (a weekly epidemiological digest published by the CDC) reported on the occupational status of COVID-19 cases in Colorado and Utah. In the Colorado study, 1,738 COVID-19 cases from nine Colorado counties were evaluated; these cases occurred before the state lockdown that began on March 26, 2020 (Marshall et al., June 30, 2020). Half of the individuals were exposed in a workplace setting, with the greatest numbers of COVID-19-positive employees coming from healthcare (38%), professional or office settings (17%), public administration or armed forces (7%), and manufacturing (6%). A similar study was performed with outbreak data in Utah from March 6 through June 5, 2020 on non-healthcare, non-educational, and non-congregate housing workplaces (Bui et al., August 17, 2020). This study found that 210 out of 277 outbreaks (76%) occurred in workplace settings. Approximately 12% (1,389 of 11,448) of all confirmed COVID-19 cases in Utah were associated with workplace outbreaks. Outbreaks were found in all twelve industry sectors the authors evaluated, and were most prevalent in: wholesale trade; manufacturing; transportation and warehousing; construction; administrative, support, and waste management; and arts, entertainment, and recreation.

Chen et al. (January 22, 2021) analyzed records of deaths occurring on or after January 1, 2016 in California and found that mortality rates in working aged adults (18 – 65 years) increased 22% during the COVID-19 pandemic (March through October 2020) compared to pre-pandemic periods. Relative to pre-pandemic periods, the groups of employees experiencing the highest and statistically significant increases in relative excess mortality were those in food/agriculture (39% increase), transportation/logistics (28% increase), facilities (27% increase), and manufacturing (23% increase). Other groups that also experienced excess and statistically significant mortality compared to pre-pandemic periods were health or emergency

DRAFT

workers (19% increase) and retail workers (14% increase). The study authors concluded that certain occupational sectors were impacted disproportionally during the pandemic and that essential work conducted in person is a likely avenue of infection transmission.

Hawkins et al. (January 10, 2021) examined death certificates of individuals who died in Massachusetts between March 1 and July 31, 2020. An age-adjusted mortality rate of 16.4 per 100,000 employees was determined from 555 death certificates that had useable occupation information. Employees in 11 occupational groups had particularly high mortality rates: healthcare support; transportation and material moving; food preparation and serving; building and grounds cleaning and maintenance; production, construction and extraction; installation/maintenance/repair; protective services; personal care services; arts/design/entertainment; sports/media; and community and social services. The study authors noted that occupation groups expected to have frequent contact with sick people, close contact with the public, and jobs that are not practical to do from home had particularly elevated mortality rates.

The impact of COVID-19 across diverse industry sectors is not limited to the United States. The European Centre for Disease Control and Prevention investigated clusters in occupational settings throughout Europe (ECDC, August 11, 2020). The Centre reviewed 1,376 occupational clusters from 16 European countries from March through July of 2020. Indoor settings contributed to 95% of reported clusters. Hospitals, long-term care facilities, food packaging and processing, factory and manufacturing, and offices accounted for the most clusters.

**b. Impact on Employees in General Industry, Agriculture, Construction, and Maritime**

DRAFT

Data on SARS-CoV-2 infections, illnesses, and deaths among employees in general industry, agriculture, construction, and maritime support OSHA's finding that COVID-19 poses a grave danger to employees in these sectors across the U.S. economy. This section summarizes studies and reports of COVID-19 illness and fatalities in a wide range of workplaces across those industry sectors. Not all workplace settings are discussed; nor is the data available to do so. However, the commonalities of the work done in these workplace settings (e.g., close contact with co-workers and/or the public, prolonged time spent in enclosed areas, contact with potentially contaminated materials or surfaces) suggest that exposures to SARS-CoV-2 are occurring in a wide variety of settings based on factors that are not necessarily industry specific and that therefore all employees who work in the presence of other people (e.g., co-workers, customers, visitors) need to be protected.

*Retail and Service*

Retail and service employees are often in close contact with co-workers and the public in indoors settings. Their workplaces include, for example, stores, hotels, bars, restaurants, barber shops, and salons. These locations are frequently the settings for identified occupational clusters (Nashville Metro Health Department, November 30, 2020; Illinois Department of Public Health, January 15, 2021; ECDC, August 11, 2020) and infections (WDH and WLNI, November 10, 2020; Allan-Blitz et al., December 11, 2020). Lan et al. (October 30, 2020) conducted a cross-sectional study to examine the risks of COVID-19 exposure and infection for employees in a Boston, Massachusetts-area retail grocery store market. The study tested 104 grocery store employees, of whom 20% (21 employees) were positive for COVID-19; 76% of confirmed cases did not have symptoms. After adjusting for gender, smoking, age, and the prevalence of COVID-19 in the employees' residential communities, employees who had direct customer exposure

DRAFT

(e.g., cashiers, sales associate, cart attendant) were 5.1 times more likely to have a positive test for COVID-19 than employees without direct face-to-face customer exposure (e.g., stockers, backroom, receiving and maintenance). The infection rate of 20% among all employees was significantly higher compared to the surrounding community.

In North Carolina, the Haywood County Health and Human Services Agency reported a cluster that emerged from a hair salon and accounted for a third of all cases in Haywood County over a nine-day period (Haywood County Health and Human Services, September 17, 2020). Three employees were infected in addition to ten other people. This cluster is one of five to occur in salons, barber shops, or spas that has been reported in North Carolina (North Carolina Department of Health and Human Services, January 11, 2021). It should be noted that Zhang's study using O*NET data concluded that barbers have one of the highest predicted risks of SARS-CoV-2 infection among all job activities in non-healthcare settings based on their potential for exposure to disease and physical proximity (Zhang, November 18, 2020).

Similar results have been reported internationally. De Gier et al. (2020) reported positivity rates for SARS-CoV-2 testing in different occupational groups from the Netherlands from June to October 2020. Testing was provided for symptomatic individuals and during contact tracing. During peak infection periods, retail and service-related employees such as hairdressers/aestheticians, retail workers, trainers and sports instructors, and hospitality workers had positivity rates exceeding rates in the reference group consisting of individuals who were 25 years of age or older and reported working in an occupation that did not involve close contact.

In another study out of the UK, during the period from March 9 through May 25, 2020, sales and retail assistants were one of seventeen occupations found to have increased rates of death involving COVID-19 among men, and one of four occupations to have increased rates of

DRAFT

death among women, with 34.2 deaths per 100,000 men and 15.7 deaths per 100,000 women (Windsor-Shellard et al., June 26, 2020). During that same time period, chefs were also among the occupations with the highest death rates among men, with 56.8 deaths per 100,000 men. In a later related study conducted from March 9 through December 28, 2020, the study authors found that in the UK, men and women who worked in "caring, leisure and other service occupations" had among the highest rates of death involving COVID-19, with 64.1 deaths per 100,000 men and 27.3 deaths per 100,000 women (Windsor-Shellard et al., January 25, 2021). Similar findings in the retail and service industry were observed in a study from Norway. Using a COVID-19 registry, researchers were able to study COVID-19 incidence in a variety of retail and service occupations and compare the results to incidence among other occupational groups and unemployed people (Magnusson et al., January 6, 2021). The proportion of waiters, bartenders, and food and service counter attendants with COVID-19, measured per 1,000 employees, were 2 to 3 in the first surge and 16 to 17 during the second surge. During the second surge, retail and service occupations, including travel stewards, bartenders, waiters, food counter attendants, hairdressers, and sales shop assistants, were among the occupational groups with the greatest risk of SARS-CoV-2 infection. During the second surge, those occupational groups were 1.1 to 1.9 times (as estimated from a graph) more likely than everyone else in their working age group (age 20 to 70 years) to have COVID-19. This study suggests that employees in retail and service industries, whose work requires significant contact with others, have among the highest risks of developing COVID-19 when compared to others in the same age group, including unemployed persons.

DRAFT

*Manufacturing and Warehousing*

Individuals employed in the manufacturing and warehousing industries often work in high-density settings for prolonged periods of time. Their work is often performed in enclosed facilities, where potentially-contaminated workstations, tools, and breakroom tables might be shared during the same shift or between shifts. Bui et al. (August 17, 2020) analyzed data from the Utah Department of Health's COVID-19 case surveillance system, which included data on outbreaks in manufacturing settings. Of the 210 outbreaks that occurred in workplaces, 43 (20%) occurred in manufacturing workplaces. At manufacturing workplaces, the incidence among workplace-outbreak-associated cases was 339 per 100,000 employees, and there were 467 workplace-outbreak-associated cases in the manufacturing sector. Similarly, the Illinois Department of Health reported that manufacturing and factory facilities are the most common workplace setting for COVID-19 outbreaks in that state, with 129 outbreaks in those facilities (Illinois Department of Public Health, January 15, 2021).

The Oregon Health Authority (OHA) regularly publishes occupational data on COVID-19. In January, the OHA noted several warehousing facilities with COVID-19 outbreaks. OHA epidemiologists consider cases to be part of a workplace outbreak if a cluster of cases occurred at a workplace within a space and time of the incubation period for the virus, unless a more likely alternative source for infection outside of the workplace is identified (OHA, January 13, 2021). As noted in more detail in Section V., Nature of the Disease, the incubation period is the time between infection and symptom onset, and is generally considered to be 14 days for COVID-19. At least four different warehouse facilities in Oregon have had workplace outbreaks in which over 100 employees at each facility were infected with COVID-19. Separately, the Illinois Department of Health reported that there have been 18 warehouse/distribution center outbreaks (defined in their report as five or more cases from different households and not connected to

DRAFT

other sources linked to a common location during a 14-day period) since July 1, 2020 (Illinois Department of Public Health, January 15, 2021). In addition to government reports, media sources have frequently reported on COVID-19 spread in warehouses. On October 11, 2020, the *Star Tribune* reported that 225 of the approximately 1,500 employees at Amazon's fulfillment center and related sorting center in Shakopee, Minnesota had tested positive for COVID-19 (Norfleet, October 11, 2020). The report noted that at that time this was nearly double the average number of cases in the general populace in Minnesota.

*Transportation*

Employees in the transportation sector are also at risk for exposure to SARS-CoV-2 due to prolonged close contact with the public and co-workers in enclosed settings with poor ventilation. This industry includes public transit workers, taxi drivers, and rideshare drivers. Commuters and customers also might not wear face coverings, even if required. Few studies have evaluated risk in this industry, but an NYU survey completed within a three-week period of August 2020 found that 24% of New York City transit workers reported that they had been infected with COVID-19 (Gershon, October 2020).

These findings are also reflected in the international literature. The De Gier et al. (2020) study described above found that, during peak infection periods, public transport personnel had positivity rates exceeding rates in the reference group consisting of individuals who were 25 years of age or older and reported working in an occupation that did not involve close contact. In the UK study previously discussed, from March 9 through May 25, 2020, the related occupations of taxi drivers and chauffeurs, and that of bus and coach drivers were among the 17 occupations found to have the highest rates of death involving COVID-19 among men, with 65.3 and 44.2

DRAFT

deaths per 100,000 men, respectively (Windsor-Shellard et al., June 26, 2020). These mortality rates were 2-3 times higher than those of the general population of working age men.

Similarly, in the Norwegian study discussed above, transit workers were found to have high infection rates and to be among the occupations with the highest risk of developing COVID-19 compared to everyone in their working age group (Magnusson, January 6, 2021). Car, taxi, tram, and van drivers were found to have particularly high rates of infections during the 2020 Spring and Fall surges (4 to 6 and 11 to 13 per 1000 employees in the Spring and Fall, respectively). During the Spring surge, bus and tram drivers were approximately 2.2 times more likely and taxi drivers were approximately 1.2 times more likely to have COVID-19 compared to all other subjects in their working age group (as estimated from a figure). During the fall surge, bus and tram drivers, transport conductors, and taxi-drivers were approximately 1.3 to 1.4 times more likely to have COVID-19 compared to everyone in their working age group (as estimated from a figure). This heightened risk for transportation workers was also observed in a study by Lan et al. (May 19, 2020), which identified 103 possible work-related cases of COVID-19 in a variety of occupations (14.9% among a total of 690 local transmission) in six Asian countries (Hong Kong, Japan, Singapore, Taiwan, Thailand, and Vietnam). A possible work-related case was defined by close contact with another confirmed case because of work or an unknown contact history but with infection likely to have occurred in the workplace. This observational study found that drivers and transport workers represented the second highest number of cases among occupational groups, accounting for 18% of the 103 work-related cases.

*Schools and Child Care*

The category of schools and child care consists of educational institutions serving children from kindergarten through the 12$^{th}$ grade (including public and private schools) and

DRAFT

child care and early education programs. Schools and child care providers are an important part of the infrastructure of communities. They provide critical services to students and indirectly enable caregivers to work. This section focuses on the impact of COVID-19 on the workforce in school and child care settings. A CDC review (February 12, 2021) of the broader school and child care environment discusses how COVID-19 impacts the entire community and ways schooling can continue in situations where community transmission is present.

School and child care occupations include teachers, non-teaching staff, and child care providers. Employees at schools and child care centers often interact with many students in close proximity, for extended periods of time, along with co-workers resulting in an increased exposure risk to COVID-19. Employees in school and child care settings have a risk of exposure through co-workers and the children they provide for. Staff-to-staff transmission is considered far higher risk than student-to-staff, but there is evidence of both (Ismail et al., December 8, 2020; Gandini et al., December 18, 2020; Stein-Zamir et al., May 2020; Yung et al., June 25, 2020; Ehrhardt et al., September 10, 2020).

A large-scale UK study on COVID-19 outbreaks in school systems determined that staff-to-staff transmission led to more clusters in this setting than did student-to-staff transmission (Ismail et al., December 8, 2020). Utilizing the Public Health England surveillance program, the researchers actively followed transmission of COVID-19 in pre-school, primary, and secondary school settings. In the 55 outbreaks (i.e., at least two linked cases observed over 14 days in the same setting) that occurred during the study, nearly half (26) were the result of staff-to-staff transmission with 73% of the cases being among staff. The likelihood of outbreaks in school systems was related to the level of local community transmission, which the study authors did not find surprising since increased community transmission increases the chances for the virus to

DRAFT

be introduced into educational settings. However, the study was limited to communities with transmission levels below 20 cases per 100,000. In contrast, in the United States from January 10-17, 2021, the median cases per 100,000 was 62.4, with California and Arizona both over 100 cases per 100,000. Hawaii was the only state with a transmission rate below 20 cases per 100,000, at 10.5 cases (CDC, January 17, 2021).

Studies of school and child care settings suggest that while students do present a risk of COVID-19 transmission to others, adult co-workers present a greater risk as a source of transmission. In an Italian study reviewing COVID-19 cases from September 12 to November 7, 2020, the researchers found that teachers were more likely to be index cases (individuals that bring COVID-19 into the school setting) and that the secondary infection rates among teachers during these events were higher than among students (38% vs. 11%; Gandini et al., December 18, 2020). However, because the number of students greatly exceeded the number of teachers, there were more total index cases (355 in students vs. 137 in staff) as well as secondary cases (64 in students vs. 17 in staff) among students. It should be noted that the researchers also found that school operations were not associated with causing the second wave of COVID-19 in Italy due to implementation by schools of a comprehensive mitigation approach that included layered mitigation and cancellation of extracurricular activities. An Australian study evaluated COVID-19 cases related to school and child care from March 5 to April 9, 2020, finding 14 secondary cases (Macartney et al., 2020). In all cases, the index case causing the secondary infections was an adult. The study also found that 6% of adults in close contact with the index case ultimately contracted the virus, whereas only 2% of children in close contact with the index infection were infected.

DRAFT

Teachers were also found to be impacted more than students in an Israeli study of a May 2020 outbreak in Israel in a secondary education setting that infected 153 students (13.2% attack rate (i.e., the number of individuals who are infected in comparison to the total number at risk)) and 25 staff members (16.6%) (Stein-Zamir et al., May 2020). The researchers noted that the Ministry of Health lifted the requirement for schoolchildren to use face coverings for three days during a heatwave and that each class had separate air-conditioning units running constantly, which recirculated air and were considered to be the primary driver of the incident. The authors suggested that proper use of face coverings and adequate ventilation could have minimized the outbreak.

Risk of transmission from students to staff appears to be greater in older children than younger ones (Goldstein et al., October 29, 2020). An Italian study evaluated nine clusters in various school settings that resulted in 38 secondary cases (Larosa et al., December 10, 2020). The researchers found an attack rate of only 0.38% in elementary age settings in comparison to a 6.46% attack rate in middle and high school settings. This was also observed in an Australian study, where they found higher attack rates in high schools (National Centre for Immunisation Research and Surveillance, October 21, 2020). Attack rates in high school were observed as 1.1% with primary schools at 0.4%. Adult transmission was found to be much higher in primary schools and early childcare (6.6%).

*Oil and Gas Industry*

The oil and gas industry has not been well studied with respect to infections of COVID-19, but a review of state reports and news articles suggest that the industry is impacted by COVID-19. A review of Alaska Health Department case summaries from August 2-15, 2021, found seven non-resident cases attributed to the oil industry (Alaska Health Department, August

DRAFT

12, 2020; Alaska Health Department, August 19, 2020). Media reports have also indicated impacts across the country in this industry. Out of the 7,000 employees at Shell's Beaver County ethane cracker plant, 335 had tested positive for COVID-19 by December 2020 since the pandemic first hit Pennsylvania in mid-March 2020 (Suttles, December 3, 2020). As of early December 2020, that number appeared to be growing and an additional 212 employees were self-isolating (Suttles, December 12, 2020). A separate report indicated in July 2020 that several oil refineries in Texas were dealing with large numbers of COVID-19-positive employees, with one of the largest refineries reporting over 100 total cases since the start of the pandemic (Powell, July 10, 2020).

*Package and Postal Delivery*

Package and postal delivery employees, including U.S. Postal Service (USPS) employees and private delivery service employees, deliver mail and packages to peoples' homes or commercial spaces. The work can sometimes be done without contact with others but often requires visiting multiple locations in a work shift to deliver mail and packages. Some packages require signature for delivery, and employees potentially come in close contact with people who have COVID-19. There is also a heightened COVID-19 exposure risk from serving customers at locations where packages are picked up or dropped off and supplies can be purchased. Employees at those locations, like employees in other retail settings, can be exposed to numerous individuals at close proximity. In addition, close and extended contact with co-workers can occur in areas where mail and packages are sorted.

The USPS Office of the Inspector General found that by July 21, 2020, 7,421 USPS employees had been infected, and 80 employees had died of COVID-19 (USPSOIG, November 20, 2020). In addition to those mortality and morbidity numbers, 33,945 employees had to

DRAFT

quarantine. On May 21, 2020, it was reported that the USPS accounted for 60 of 126 federal employee fatalities from COVID-19 (Katz et al., May 21, 2020).

*Janitorial Services*

Residential and commercial janitorial service employees (e.g., janitors, residential cleaners) perform necessary functions by going into peoples' homes or workplaces to perform cleaning and maintenance tasks. The work can sometimes be done without contact with others (e.g., cleaning a commercial building after hours or a residence when no one is home), but there is heightened COVID-19 exposure risk from going to multiple locations and potentially coming in close contact with people who have COVID-19 or surfaces/waste contaminated with SARS-CoV-2. Additionally, janitorial service employees might be called upon to clean work areas following the presence of a person known to be sick with COVID-19. Robust studies have yet to be performed for this occupational group, but clusters of infections have been noted in the media. On May 19, 2020, the University of Texas reported that a workplace cluster of 11 employees in custodial services had contracted COVID-19 (University of Texas, May 19, 2020). Providing more support for this concern, Zhang's study (2021) found that the more general category of building and grounds cleaning and maintenance was one of the occupational groups estimated to have the highest numbers of cases in the state of Washington (639 cases per 100,000 employees employed).

*Law Enforcement and Related Fields*

Employees in law enforcement and other security-related fields likely face a relatively high risk of developing COVID-19 because of the nature of their work. Employees in these fields often come into close contact with co-workers and the public. They might transport people in vehicles and spend considerable time in enclosed spaces with others. Law enforcement officers

DRAFT

and security personnel are often tasked with enforcing COVID-19 policies, which might put them in close contact with individuals resisting protective recommendations, such as face-covering use and physical distancing. Officers might have direct physical contact when apprehending or detaining individuals or checking for weapons. Security personnel at screening points might have direct contact with belongings, such as handbags and their contents, which could be contaminated with SARS-CoV-2. In addition, many security personnel are being assigned new duties relating to COVID-19, such as symptom screening, which could result in them spending extended periods of time in close contact with many members of the public.

The National Law Enforcement Officers Memorial Fund keeps track of officers whose COVID-19 fatalities were determined to be occupational in nature (National Law Enforcement Memorial Fund, January 18, 2021). From March 24, 2020 through January 12, 2021, 199 officer fatalities were attributed to SARS-CoV-2 infections acquired in the line of duty. The Officer Down Memorial Page, which also tracks fatalities determined to be occupationally related, reported 200 officer fatalities in the line of duty during that same time frame (ODMP, January 18, 2021a). They also reported that officers were 4.4 times more likely to die from occupationally related cases of COVID-19 than by gunfire (ODMP, January 18, 2021b).

In a study examining COVID-19 antibodies in employees from public service agencies in the New York City area from May through July of 2020, 22.5% of participants were found to have COVID-19 antibodies (Sami et al., 2021). The percentages of police dispatchers, traffic officers, security guards, and dispatchers found to have COVID-19 antibodies (29.8 to 37.3%) were among the highest levels observed in all the occupations. The study authors noted that those jobs involve frequent or close contact with the public or are done in places where employees work in close proximity to their coworkers.

DRAFT

*Correctional Facilities*

Employees at correctional facilities might have hands-on and close contact with inmates or detainees. The inmates and detainees are likely to have increased risk of infection, because they share cells, limiting their ability to physically distance, and they share indoor facilities, which can increase the possibility of contact transmission. The increased risk of infection to inmates and detainees leads to a similar increase in the risk of infection to the employees at correctional facilities because of the close contact required with inmates and detainees. These employees are also frequently in close contact with their co-workers in enclosed spaces, further increasing the risk of transmission.

Wallace et al. (May 6, 2020) evaluated data on COVID-19 cases and deaths among correctional facility employees and inmates from January 21–April 21, 2020. Data was reported to CDC by 37 (69%) of 54 state and territorial health department jurisdictions. Of these 37 jurisdictions, 32 (86%) reported at least one COVID-19 case from a correctional facility. Of the 420 facilities with a case, 221 (53%) reported cases only among staff members. In total, 4,893 COVID-19 cases among incarcerated or detained persons and 2,778 cases among staff members were reported (total tested not provided). Among staff member cases, 79 hospitalizations (3%) and 15 deaths (1%) were reported. Among the 32 jurisdictions reporting cases, the median number of affected facilities was 10 (range = 1–59), the median number of cases in incarcerated or detained persons was 34 (range = 0–858), and the median number of cases in staff members was 26 (range = 1–756). The study authors noted that "correctional and detention facilities face challenges in controlling the spread of infectious diseases because of crowded, shared environments and potential introductions by staff members and new intakes."

DRAFT

Kırbıyık et al. (November 6, 2020) analyzed movement through a network-informed approach to identify likely high points of transmission within the Cook County Jail in Chicago, IL. At that facility, over 900 COVID-19 cases were reported across 10 housing divisions in 13 buildings from March 1–April 30, 2020. Staff members were required to report symptoms of COVID-19 (probable cases) or receipt of a positive test result (confirmed cases). A total of 2,041 staff members (77% of staff) were included in the network analysis because information was available about their shift and division assignments, and 198 (9.7%) of those staff members had COVID-19 during the two-month study period. Connections between staff members who had COVID-19 were higher than expected, suggesting likely transmission among staff members. Of 1,080 detained persons who were tested for COVID-19 because they had symptoms or close contact with a case, 472 of 1,080 (12.3%) tested positive. A total of 3,834 detained persons were included in the analysis because information was available for their cell or bed assignments. Fewer connections than expected were observed among detained persons with SARS-CoV-2 infections, suggesting effectiveness of medical isolation at reducing transmission.

Wallace et al. (May 8, 2020) analyzed COVID-19 case data from the Louisiana Department of Health and CDC's COVID-19 Management Assessment and Response tool. From March 25–April 22, 2020, 46 facilities out of 144 Louisiana correctional or detention facilities (32%) reported laboratory-confirmed cases among detainees or staff. Of these 46 facilities, 32 (70%) reported cases in staff. In these 32 facilities, there were 253 cases of COVID-19 among correctional and detention facility staff (total number of staff not reported). Among the 253 COVID-19 cases, 19 (7.5%) were hospitalized and 4 (1.6%) died.

In a study examining COVID-19 antibodies in employees from public service agencies in the New York City area from May through July of 2020, 22.5% of participants were found to

DRAFT

have COVID-19 antibodies (Sami et al., 2021). The percentage of correctional officers found to have COVID-19 antibodies (39.2 %) was the highest observed among all the occupations.

*Homeless Shelters*

Employees at homeless shelters may have close contact with residents of those facilities. Because residents of shelters often live in crowded conditions and share living and sleeping arrangements, physical distancing is often difficult. In addition, because they share indoor facilities, this could increase the possibility of contact transmission. For these reasons, residents at homeless shelters are likely to have increased risk of infection. As a result, the risk of infection is also increased in employees at those shelters who have close contact with the residents.

In an investigation of reports of cases or clusters of COVID-19 in homeless shelters, Mosites et al. (May 1, 2020) evaluated COVID-19 data among staff and residents of one homeless shelter in Boston, MA, one in San Francisco, CA, and three in Seattle, WA. One cluster of COVID-19 cases (defined as two or more cases in the preceding two weeks) occurred at each facility between late March and early April 2020. The researchers also investigated 12 shelters in Seattle, WA, in which a single case had been identified at each shelter, and two shelters with no known COVID-19 cases in the preceding two weeks in Atlanta, GA. At each of these 19 shelters, the researchers planned to test all shelter residents and staff. Overall, the researchers tested 313 staff members and 1,192 residents. In Seattle, 6 of 35 staff members (17%) and 31 of 179 residents (17%) tested positive. In Boston, 15 of 50 staff members (30%) and 147 of 408 residents (36%) tested positive, and in San Francisco, 10 of 63 staff members (16%) and 95 of 143 residents (66%) tested positive. Among the 12 shelters in Seattle that had one previous case in the preceding two weeks, 1 of 106 staff members (1%) and 10 of 213

DRAFT

residents (5%) tested positive. Finally, among the two shelters in Atlanta where no cases had been reported, 1 of 59 staff members (2%) and 10 of 249 residents (4%) tested positive. The study authors concluded that when testing followed identification of a cluster, high percentages of both staff and residents were found to be infected.

In Tobolowsky et al. (April 22, 2020), SARS-CoV-2 testing was offered to residents and staff at three homeless shelters in Seattle, WA, during March 30–April 1, 2020. Repeat testing was then offered on April 7–8, 2020, to all residents and staff who were not tested initially or who had had negative test results. Additional cases were identified through separate symptom screening events, and further additional cases were identified when two staff members independently sought health care. In total, COVID-19 was diagnosed in 8 of 38 (21%) staff members and 35 of 195 (18%) residents.

*Agriculture and Related Industries*

Studies and reports have also noted SARS-CoV-2 infections in agriculture and agriculture-related industries, including meat and poultry processing. These industries can involve characteristics that increase the likelihood of SARS-CoV-2 transmission, such as high-density, close contact with co-workers, congregate housing and shared transportation, and enclosed work spaces that are not ventilated with infectious disease transmission in mind. Employees are especially at risk in areas of the plant where they are not able to maintain 6 feet of physical distance. One study, Taylor et al. (December 15, 2020), estimated that about 7% of the entire meat processing work force had been infected by July 21, 2020, based on a CDC sample of 264 meat processing facilities.

Donahue et al. (August 7, 2020) and Steinberg et al. (August 7, 2020) highlighted the risk of workplace COVID-19 exposures in specific meatpacking and processing facilities in Nebraska

DRAFT

and South Dakota, respectively. Donahue et al. found that 375 employees out of 1,216 (31 %) were positive for COVID-19 in a Nebraska meat processing facility from April through May of 2020. Two of 163 symptomatic employees were hospitalized (1.2 %), but no deaths were identified. Interviews were held with 241 positive employees. Seventy of those employees (29%) reported close contact with a visibly ill person or a person with a COVID-19 diagnosis at work, and 63 (27%) reported exposure to a household member who was ill or tested positive for COVID-19. Thus, a substantial number of employees reported being exposed in the workplace. Seventy-four percent of the close contacts in the workplace occurred in production areas. Most employees (88%) used a private vehicle to get to work and only 11% carpooled to work.

Steinberg et al. (August 7, 2020) further illustrated the risk of workplace exposures in a South Dakota meat processing facility. During March 16 through April 25, 2020, a total of 929 of 3,635 (25.6 %) meat plant employees were confirmed to have COVID-19. Thirty nine (4.2 %) of those employees were hospitalized, 14 (1.5 %) were admitted to the ICU, and two died (0.2%). During that period, employees represented 41.8 % of the COVID-19 cases identified in the community. Attack rates among production employees in the Cut (30.2%), Conversion (30.1%), and Harvest (29.4%) departments (where spacing between employees is less than 6 feet) were double that of salaried employees (14.8%). Lower attack rates for salaried employees likely were due to the modification of salaried employees' workstations to increase physical distancing from each other and production line work. Between March 16 and April 25, employees of the facility in South Dakota represented 41.8% of all community cases. The study authors concluded that the study highlights the potential for rapid transmission in meat processing facilities.

DRAFT

Waltenburg et al. (July 10, 2020) reported aggregate data on confirmed COVID-19 cases and deaths from 239 meat or poultry processing plants in 23 states, through May 31, 2020. COVID-19 was confirmed in 16,233 of 112,616 employees and 86 COVID-related deaths were reported. Fourteen states reported total numbers of employees and COVID-19 was diagnosed in 9.1% of 112,616 employees. At each facility the proportion of employees who had COVID-19 varied from 3.1 to 24.5%, and the proportion of cases resulting in death ranged from 0.2 to 2.4%. Combining the data from this report with data reported through April 27 (including six additional states that did not contribute data from this report), the study authors reported at least 17,358 cases and 91 COVID-19 related deaths in meat and poultry processing employees.

In another report, Waltenburg et al. (January, 2021) further reported COVID-19 cases in employees from meat and poultry processing facilities in 31 states from March 1 through May 31. As reported in Table 2 of that report, 28,364 of 186,011 employees were confirmed to have COVID-19 and 132 died. For states that reported total numbers of employees, percentages of employees who developed COVID-19 ranged from 3.1 to 27.7% in each state. For states that reported at least one COVID-19-related death, the percentages of employees who died in each state ranged from 0.1 to 2.4%. The authors found a high burden of disease in persons who were racial or ethnic minorities employed at these facilities. Higher incidence in these populations might be due to the likelihood of these employees working in areas in the plant where transmission risk is higher. For instance, Rubenstein et al. (December 18, 2020) focused on COVID-19 case incidence in poultry processing in Maryland and found that foreign-born poultry employees were more likely than U.S.-born poultry employees to work in fixed production areas, such as Cut and Packaging and Evisceration, where maintaining physical distance is more difficult.

DRAFT

In the same study, Waltenburg et al. (January, 2021) also evaluated COVID-19 incidence in food manufacturing and agricultural settings (e.g., manufacturing or farming involving fruits, vegetables, dairy, baked goods, eggs, prepared foods) as reported in 30 states from March through May 2020. In food manufacturing and farming of fruits, vegetables, dairy, and other items, 742 workplaces were affected, including 8,978 infections and 55 fatalities. For states that reported total numbers of employees, the proportion of employees who developed COVID-19 in each state ranged from 2.0 to 43.5%. For states that reported at least one death, the percentages of deaths among cases ranged from 0.1 to 3.8%.

Several media sources reported cases and outbreaks of COVID-19 in farm workers in Tennessee, Vermont, and California (Knight, August 10, 2020; Epp et al., October 8, 2020; Associated Press, September 10, 2020). Sources of risk were reported as shared housing and transportation, lack of physical barriers between employees, challenges with physical distancing, and difficulties with wearing a face covering in high temperatures (Accorsi et al., October 20, 2020).

*Construction*

Many employees engaged in construction (including carpentry, ironworking, plumbing, electrical, heating/air conditioning/ventilation, utility construction work, and earth-moving activities) are at risk for transmission of SARS-CoV-2. People in the construction trades often work in high density settings, and in close proximity to one another. Employees might share transportation, and might work with other people in enclosed spaces with inadequate ventilation. COVID-19 clusters are common in construction settings (Nashville Metro Health Department, November 30, 2020; Bui et al., August 17, 2020; ECDC, August 11, 2020), and researchers have

DRAFT

documented high numbers of infections among construction workers (WDH and WLNI, November 10, 2020; Allan-Blitz et al., December 11, 2020).

Bui et al. (August 17, 2020) investigated the demographics of COVID-19 outbreaks in different industry sectors in Utah from March 6 to June 5, 2020. Although the construction workforce represents only 9% of the total workforce in Utah (113,610/1,305,130 workers), 15% of the total outbreaks (32/210) occurred in the construction sector. Construction was the industry with the fourth highest COVID-19 workplace incidence rate in Utah during this time, with the third highest number of COVID-19 workplace cases. The incidence rate of COVID-19 associated with these outbreaks was 122/100,000 workers. Of the 139 total ill workers at the time of this study, 11 were admitted to the hospital and 7 had severe outcomes (intensive care unit admission, mechanical ventilation, or death).

Pasco et al. (October 29, 2020) examined the association between construction work during the COVID-19 pandemic and community transmission and construction worker hospitalization rates in Austin, Texas from March 13 to August 20, 2020. A "Stay Home-Work Safe" order enacted on March 24, 2020, limited construction to only critical infrastructure and excluded commercial and residential work. One week later, the Texas governor lifted the restriction for essential workers, including allowing any type of construction work to resume, while keeping the order in place for other workers. The authors found that resuming construction during the shelter-in-place order led to an increase in community transmission, an increase in hospitalizations among community members, and an increase in hospitalizations of construction workers. By mid-July, Austin Public Health identified at least 42 clusters of COVID-19 cases in the construction industry; 515 individuals were hospitalized for COVID-19 illnesses acquired as part of these clusters, and 77 of those reported working in construction. The study found that

DRAFT

construction workers had a nearly 5-fold increased risk of hospitalization in central Texas compared with other occupations. The model predicted that allowing unrestricted construction work would be associated with an increase in COVID-19 hospitalization rates from 0.38 per 1,000 residents to 1.5 per 1,000 residents overall, and from 0.22 per 1,000 construction workers to 9.3 per 1,000 construction workers for the construction industry specifically. The authors concluded that stringent workplace safety measures could significantly mitigate risks related to COVID-19 in the industry.

*Maritime*

OSHA's maritime standards cover marine terminals, longshoring operations, and shipyard activities. Examples of marine terminals include docks, berths, wharves, and structures for loading and delivery of waterborne shipments (or passengers), as well as the associated cargo handling equipment and storage facilities. Longshoring workers conduct activities and operate equipment to transfer cargo between ships and shore. They might have close contact with co-workers or ship crews and might use shared equipment when loading and unloading ships and refueling. These activities are similar to tasks conducted by warehousing workers. They might also be exposed to contaminated materials when removing waste from ships, a scenario similar to janitorial workers. Passenger terminal workers might have close contact with passengers at ticketing counters and when helping them to board or disembark. They might also have direct contact with passengers' baggage. These tasks performed by terminal employees are similar to those performed by employees in retail and services industries. Shipyard activities are performed on shores, piers, terminals, yards, shipyards, machine shops, riverbanks, floating vessels or in drydocks or graving docks. Tasks performed in shipyards include construction, repair, maintenance, and demolition. Therefore, risks are similar to those found in construction work,

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where employees can work close to each other and share equipment and tools. Although few reports have focused specifically on COVID-19 spread in maritime, the CDC determined there was a need to provide guidance for this industry (CDC, September 17, 2020).

One major cluster has been observed in the United States among dockworkers. The COVID-19 cluster emerged from the Ports of Los Angeles and Long Beach. As of January 17, 2021, 694 longshore workers reported SARS-CoV-2 infections, with 12 fatalities (Roosevelt, January 20, 2021). Positivity rates (i.e., the number of positive results per number of tests) for the employees at the Port of Los Angeles and Long Beach Port were 65% and 71%, respectively. For reference, LA County positivity rate ranged from only 14.0-16.5% from January 11-17, 2021 (LA County Public Health, January 17, 2021). The executive director of the Los Angeles Port noted that approximately 1,800 employees were unable to work due to SARS-CoV-2 infections, quarantine, or fear of infection. The loss of labor is so significant that there are increasing concerns that the terminals may be forced to shut down (Roosevelt, January 20, 2021). This incident, along with the characteristics of this industry that are shared with other industries with elevated COVID-19 risks, demonstrates that COVID-19 precautions are necessary in the maritime industries covered by OSHA.

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*Conclusion for General Industry, Agriculture, Construction, and Maritime*

The evidence described above provides examples of the impact that SARS-CoV-2 exposures have had on employees in general industry, agriculture, construction, and maritime. This evidence is consistent with OSHA's determination that SARS-CoV-2 poses a grave danger to employees in jobs across these industries. It demonstrates that SARS-CoV-2 has spread to employees in these industries and, in some cases, infection was linked to exposure to infected persons at the worksite (OHA, January 13, 2021; Illinois Department of Public Health, January

15, 2021; Steinberg et al., August 7, 2020; Ismail et al., December 8, 2020). The prevalence of workplace clusters in general suggest increased exposures in those industries to the extent those infected employees were at shared workplaces. This in combination with the known science of transmission, and some cases of infections occurring within the 14-day incubation period for COVID-19 and ruling out other exposures, supports the link between occupation and workplace exposure. Multiple cross-sectional studies, occupational surveys, and news reports demonstrate high rates of COVID illnesses and fatalities in occupations that require frequent or prolonged contact with the public, those in which employees are required to work indoors in close proximity to one another, and those which involve cramped spaces and/or poor ventilation. The cases and clusters of COVID-19 in occupational settings have led to fatalities and serious illnesses, as well as loss of work due to illness and quarantine. The large numbers of infected employees suggest that SARS-CoV-2 is likely to be present in a wide variety of workplaces, so there is a critical need for the employee protections contained in this ETS.

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**c. Impact on Employees in Healthcare and Associated Industries**

Data on SARS-CoV-2 infections, illnesses, and deaths among employees in healthcare and associated industries supports OSHA's finding that COVID-19 poses a grave danger to U.S. employees in these industries. Employees in healthcare and associated industries include healthcare employees, who provide direct patient care (e.g., nurses, doctors, and emergency medical technicians (EMTs)), and healthcare support employees, who provide services that support the healthcare industry (e.g., janitorial/housekeeping, laundry, and food service employees). Employees who perform death-related services (e.g., autopsy and mortuary employees) and those who provide biomedical laboratory services are also considered to work in healthcare-associated industries. Most employees who work in healthcare and associated industries perform duties that put them at risk of exposure to SARS-CoV-2.

SARS-CoV-2 is introduced into healthcare and associated industry settings by infected patients, other members of the public, or employees. Like transmission in general industry worksites, once it is introduced into the worksite, the virus can be transmitted from person-to-person at close contact through inhalation of respiratory droplets. In limited scenarios, it might also be transmitted through inhalation of aerosols, which consists of small droplets and particles that can linger in the air, especially in enclosed spaces with inadequate ventilation (CDC, October 5, 2020). Transmission is also possible when someone touches a contaminated item or surface and then touches their nose, mouth, or eyes.

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Healthcare employees who provide direct patient care are at high risk of exposure to SARS-CoV-2 because they have close and sometimes prolonged contact with patients who are infected or potentially infected with SARS-CoV-2. This contact occurs when conducting physical examinations and providing treatment and medical support. The risk can be amplified when examining or treating a COVID-19 patient who has symptoms such as coughing and difficulty breathing (leading to more forceful inhalation and exhalation), both of which can result in the release of more droplets that can be propelled further. Healthcare employees who conduct, or provide support during, aerosol-generating procedures also face a greater risk of infection (Heinzerling et al., April 17, 2020). Examples of procedures that can produce aerosols include intubation, suctioning airways, use of high-speed tools during dental work, and use of power saws during autopsies. A complete list of aerosol generating procedures, as defined by this ETS, is included in 29 CFR 1910.502(b). Employees in healthcare and associated industries are also at risk of exposure to SARS-CoV-2 through contact with body fluids, items contaminated with body fluids (e.g., surfaces, laundry, used eating utensils, waste), and specimens for laboratory analysis; they can be infected through contact transmission if they touch these contaminated surfaces or items and then touch their nose, mouth, or eyes. As in any type of workplace setting, employees in healthcare and associated industries are at risk of exposure to SARS-CoV-2 if they have close contact with co-workers while providing patient care or performing other duties in enclosed areas such as a nursing station, laundry room, or kitchen. They can also be exposed to co-workers in common areas such as breakrooms and locker rooms.

Based on the biological mechanisms of SARS-CoV-2 transmission, there is no doubt that some employees in healthcare and associated industries are at risk of exposure to SARS-CoV-2. Unlike other industry sectors, in healthcare, mortuaries, and biomedical laboratories, employees

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are performing some job tasks that create an *expectation* of exposure to people, human remains, or other materials that are known or suspected to be infected with SARS-CoV-2 capable of transmission to those employees. The very nature of caring for a patient known to have COVID-19 increases the risk to employees performing that task. This section summarizes recent studies about U.S. healthcare employees and employees in healthcare-associated industries that illustrate the impact of COVID-19 in several types of healthcare settings. Because the pandemic is recent and the evidence generated is on the frontiers of science, studies are not available for every type of employee in every type of healthcare setting. However, the studies add to the evidence that any employee in a healthcare or associated industry setting is at risk of exposure if they have close contact with others or may come into contact with contaminated materials. The studies also provide evidence that, like in every occupational setting, once SARS-CoV-2 is introduced into the workplace (e.g., through an infected patient, other member of the public, or employee), employees in that workplace are at risk of exposure.

*General Surveillance and Surveys Across the U.S.*

Burrer et al. (2020) reported surveillance data on COVID-19 cases and deaths among "healthcare personnel" between February 12 and April 9, 2020. "Healthcare personnel" were defined as "paid and unpaid persons serving in healthcare settings who have the potential for direct or indirect exposure to patients or infectious materials."[6] Although only 16% of all surveillance forms indicated whether the case was healthcare personnel, 19% of the reported cases occurred in healthcare personnel. Twelve states indicated whether the case was healthcare personnel for at least 80% of all reported cases. An estimated 11% of COVID-19 cases from

[6] The term "healthcare personnel" is similar to and encompasses OSHA's definitions of "healthcare workers" and "healthcare support workers." OSHA will use the term "healthcare personnel," consistent with the use of the term in publications it reviews, to refer to groups of workers that include both healthcare workers and healthcare support workers.

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those 12 states were healthcare personnel. Based on reported known contact with confirmed COVID-19 cases in the 14 days before illness onset, work exposures likely caused 55% of those infections. Between 8% and 10% of infected employees were hospitalized, 2% - 5% of the infected employees were admitted to the ICU, and 0.3% - 0.6% of those employees died.

CDC continues to provide general updates for COVID-19 cases and deaths among healthcare personnel. However, the values continue to be underreported, with information on healthcare personnel status reported for only 18.4% of total cases and death status reported for only 77.5% of healthcare personnel cases as of February 23, 2021 (CDC, February 23, 2021). CDC reports 410,056 healthcare personnel cases (11% of the 3,902,798 cases that included information on healthcare personnel status) and 1,455 fatalities (0.3% of healthcare employee cases) as of February 23, 2021. Independent reporting by Kaiser Health News and the Guardian in their ongoing investigative reporting database have found 3,448 fatalities among healthcare personnel in the United States (Kaiser Health News and the Guardian, January 24, 2021; February 23, 2021). The reporters for this effort consider even their own count—which is higher than the official CDC count—to be an undercount due to various reporting issues, such as a lack of reporting requirements for long term care employees for a significant portion of the initial COVID-19 surge.

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Hartmann et al. (2020) analyzed case interview data from February through May 2020 to assess the burden of COVID-19 on healthcare employees in Los Angeles County, CA, where it is mandated that all positive cases be reported to the County Department of Public Health, and all cases are interviewed. Healthcare employees were defined as any person working or volunteering in healthcare settings including hospitals and skilled nursing facilities, medical offices, mental health facilities, and emergency medical services (EMS). The definition also

includes healthcare employees providing care in non-healthcare settings such as schools, senior living facilities, and correctional facilities. Healthcare employees included both staff who interacted directly with patients and staff who do not provide direct clinical care to patients. Through May 31, 2020, 5,458 COVID-19 cases among healthcare employees were reported to the County Health Department, representing 9.6% of all cases during this time period. Of those healthcare employees, 46.6% worked in a long-term care setting, 27.7% worked in a hospital, and 6.9% worked in medical offices. Healthcare employees from all other settings represented less than 4% of total healthcare employee cases. Nurses represented 49.4% of all healthcare employee cases; no other group of healthcare employees represented more than 6% of the total reported healthcare employee cases. Of note is that some healthcare employees who do not have direct patient contact represented a greater percentage of cases than some healthcare employee groups that do have direct patient contact. For example, employees in administration (4.3%), environmental services (3.2%), and food services (2.9%) represented a higher percentage of infected healthcare employees than physicians (2.7%). When asked about known exposures, 44% of those who tested positive reported exposure to a COVID-19-positive patient or co-worker in their health facility, 11% reported exposure to a COVID-19-positive friend or family member or recent travel, and 45.1% had unknown exposures. At the time of the interviews, 5.3% of COVID-19-positive healthcare employees in Los Angeles County reported requiring hospitalization because of COVID-19, and as of May 31, 2020 there were 40 (0.7%) deaths.

Fell et al. (October 30, 2020) reviewed exposure and infection data for healthcare personnel in Minnesota between March and July of 2020. After the first confirmed case of COVID-19 in Minnesota (on March 6, 2020), the Minnesota Department of Health (MDH) requested that healthcare facilities provide a list of exposed healthcare personnel. Healthcare

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personnel included EMS personnel, nurses/nursing assistants, physicians, technicians, therapists, phlebotomists, pharmacists, students and trainees, contractors, and those who do not provide direct patient care but could be exposed to infectious agents in a healthcare setting (e.g., clerical, food services, environmental services, laundry, security, engineering and facilities management, administrative, billing, and volunteer personnel). Cases in laboratory personnel are also reported. The facilities were asked to determine if each exposure was high-risk, defined as when the healthcare personnel has close, prolonged contact with a confirmed COVID-19 case or their secretions/excretions while not wearing PPE, or close, prolonged contact with persons with COVID-19 in their household or community. MDH and the 1,217 participating healthcare facilities assessed 17,200 healthcare personnel for 21,406 exposures to COVID-19 cases, of which 5,374 (25%) were classified as higher-risk. It was reported that 373 of 5,374 personnel (6.9%) with high-risk exposures tested positive for COVID-19 within 14 days of the exposure. The report stated that only symptomatic personnel were encouraged to get tested for COVID-19, and therefore it is possible that asymptomatic cases occurred and were not detected. Of those 373 personnel who tested positive for COVID-19, 242 were exposed to a patient, resident of a congregate setting, in a congregate setting outbreak, or to another healthcare personnel. Twenty-one percent of exposures to a confirmed COVID-19 case took place in acute or ambulatory care settings, 24% occurred in congregate living or long-term care settings, and 25% occurred in congregate settings. An additional 25% of exposures to confirmed COVID-19 cases were exposures to co-workers, and 5% were exposures to household/social contacts.

The Fell study (October 30, 2020) also demonstrated that high risk exposures can occur to healthcare employees in positions throughout the healthcare facility. Available data for 4,669 (87%) of the higher risk exposures in the Fell et al. study indicated that the highest percentages

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of high-risk exposures were in nursing assistants or patient care aides (1,857; 40%) and nursing staff (1,416; 30%). The proportion of high-risk exposures represented by personnel such as administrators (247; 5%) and environmental services staff (155; 3%) were similar to those reported by medical providers, such as physicians or nurse practitioners (220; 5%). Healthcare personnel working in congregate living or long-term care settings, including skilled nursing, assisted living, and group home facilities, were more likely to receive a positive COVID-19 test result within 14 days of a higher-risk exposure than were healthcare personnel working in acute care settings. The study authors note the potential for employee transmission by cautioning that, in contrast to the recognized risk associated with patient care, healthcare employees might have failed to recognize the risk associated with interacting with co-workers in areas such as breakrooms and nursing stations. Physical distancing and PPE may therefore not have been used as consistently in those situations.

The authors of a different study concluded that nurses and EMTs were, respectively, 26% and 33% more likely to contract COVID-19 than attending physicians. Nurses and EMTs' job duties require more intense, close contact with patients compared to physicians, as well as higher frequency and duration of patient contact. Firew et al. (October 21, 2020) conducted a cross-sectional survey of healthcare employees in May of 2020 across 48 states, the District of Columbia, and U.S. territories. The 2,040 respondents who completed at least 80% of the survey were included in the study. Among included participants, 31.1% were attending physicians, 26.8% were nurses, 13% were EMTs, 8.82% were resident physicians or fellows, 3.97% were physician assistants, and 16.32% were other healthcare employees. A total of 598 respondents (29.3%) reported SARS-CoV-2 infections.

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In a prospective study of over 2 million community members and 99,795 frontline healthcare workers that was performed in the U.S. and UK from March through April 2020, healthcare workers were 3.4 times as likely to self-report a positive COVID-19 test as the general public, after adjusting for the increased likelihood of healthcare personnel receiving a COVID-19 test (Nguyen et al., 2020). In the U.S. alone, healthcare workers were almost two times more likely to report a positive test after adjusting for greater likelihood of testing.

Zhang (November 18, 2020) determined which job characteristics were associated with confirmed COVID-19 cases by comparing O*NET occupational descriptions and all confirmed COVID-19 cases in Washington State residents up to June 16, 2020. Analyses done determined that two descriptors listed in the database, disease exposure and physical proximity, were associated with case prevalence by occupation. Disease exposure and physical proximity were then used to predict which occupations were at risk of COVID-19. The author found that healthcare professions in general had the highest predicted risk for COVID-19, and that four of the top five riskiest professions were in the dental field. Orderlies had the fifth highest predicted risk. Zhang classified ambulance drivers and attendants and employees who provide death-related services (i.e., morticians, undertakers, funeral directors, and embalmers) as "nonhealthcare occupations"[7] and found those groups to be among the top 15 "non-healthcare" occupations at highest predicted risk of COVID-19. Zhang found that the COVID-19 risk was driven by disease exposure and physical proximity, illustrating characteristics that are common for almost all industries when work is not performed remotely.

*Detection of SARS-CoV-2 in Employees in Hospitals and Ambulatory Care Settings*

[7] If ambulance drivers or attendants also provide emergency medical care they are considered healthcare occupations under this ETS. Any death care workers who directly contact human remains are considered to be in healthcare-associated industries under this ETS because there is a reasonable expectation that they will contact remains infected with SARS-CoV-2.

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OSHA reviewed a number of studies done in hospitals or ambulatory care centers. Many hospitals provide short-term and/or long-term care for COVID-19 patients who have symptoms that are severe enough to require hospitalization. Therefore, close contact with COVID-19 patients is expected in hospital settings, putting hospital employees at risk of developing COVID-19. Examples of employees who work in hospitals include healthcare practitioners, who generally have either licensure or credentialing requirements (e.g., doctors, nurses, pharmacists, physical therapists, massage therapists, dentists) for the purpose of promoting, maintaining, monitoring, or restoring health. Individuals who provide healthcare support services also work at hospitals. Examples of employees who provide healthcare support services include patient intake/admission, patient food services, chaplain services, equipment and facility maintenance, housekeeping services, healthcare laundry services, medical waste handling services, and medical equipment cleaning/reprocessing services. As noted above hospital employees are at risk from close contact with patients, as well as from handling contaminated materials or waste.

Examples of ambulatory care centers include physician and dentist offices, medical clinics (including urgent care and retail-based clinics), surgical centers, and cancer treatment centers. Like hospitals, ambulatory care centers employ individuals who provide direct patient care, such as doctors and nurses, in addition to individuals who provide supporting services, such as receptionists and billing specialists. It is expected that ambulatory care centers will try to avoid contact with COVID-19 patients by providing telemedicine services whenever possible and screening patients to identify patients who may have symptoms of COVID-19, are COVID-19-positive, or were recently exposed to someone who may have symptoms of COVID-19 or is COVID-19 positive. Despite those efforts, it is always possible that screening will not detect someone who is pre- or asymptomatic (is not experiencing symptoms yet or does not experience

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symptoms over the course of the infection). Therefore healthcare employees and healthcare support employees in ambulatory care centers are at risk of infection due to close contact with patients who could potentially have COVID-19. They are especially at risk if they are exposed to aerosol generating procedures that may occur, for example, during intubation at a surgery center or some dental procedures.

Barrett et al. (2020) conducted a prospective cohort study of healthcare employees and non-healthcare employees with no known previous SARS-CoV-2 infection who were recruited and tested for SARS-CoV-2 from March 24 through April 7, 2020 at Rutgers University and two of its affiliated university hospitals in New Jersey. As of July 2020, New Jersey was one of the hardest hit areas, with less than 3% of the U.S. population but 8.5% of all known U.S. cases. Healthcare employees were defined as individuals who worked at least 20 hours per week in a hospital, had occupations with regular patient contact, and were expected to have contact with at least three patients per shift over the following three months. Occupations included residents, fellows, attending physicians, dentists, nurse practitioners, physician assistants, registered nurses, technicians, respiratory therapists, and physical therapists. Non-healthcare employees included faculty, staff, trainees, or students working at Rutgers for at least 20 hours a week and who had no patient contact. The study reported that 7.3% of healthcare employees (40 of 546) and 0.4% of non-healthcare employees (1 of 283) tested positive for SARS-CoV-2 infection. Even after the authors conducted sensitivity analyses to exclude individuals with symptoms at baseline and those who had exposure to someone with COVID-19 or COVID-19 symptoms outside of work, differences between infection rates in healthcare employees and non-healthcare employees continued to be observed. OSHA finds this suggests that healthcare employees were more likely than non-healthcare employees to have developed COVID-19 from a workplace exposure during

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the early months of the pandemic in the United States. The study authors concluded that the potential for workplace exposure is further supported by the fact that only 8% of infected study subjects reported contact with someone having COVID-19 symptoms outside of work. In addition, higher rates of infection were observed in healthcare employees who worked in the hospital that had more COVID-19 patients and was located in the community that had higher rates of SARS-CoV-2 infections. The study authors noted that because that hospital was overwhelmed, it was not always possible to separate COVID-19 vs. non-COVID-19 patients, which may have led to additional exposures among staff. Among healthcare employees, nurses had the highest rate of observed infections (11.1% tested positive), and attending physicians had the lowest rate of observed infection (1.8% positive). Resident and fellow physicians had a 3.1% positivity rate and other groups of healthcare employees had a 9% positivity rate. Increased risk of infection was associated with spending greater proportions of work time in patients' rooms and higher reported exposures to patients with suspected or diagnosed COVID-19.

Mani et al. (June 16, 2020) reported results from SARS-CoV-2 testing of 3,477 symptomatic employees in the University of Washington Medical system and its affiliated organizations in Seattle, WA, between March 12 and April 23, 2020. During that period, 185 (5.3%) employees tested positive. Prevalence (i.e., proportion) of SARS-CoV-2 in frontline healthcare employees (those with face-to-face contact with patients) was 5.2% and prevalence in non-frontline staff was 5.5%. Some staff who were asymptomatic also underwent screening as part of outbreak investigations, and 9 of 151 (6%) tested positive. When findings from symptomatic and asymptomatic staff were combined, SARS-CoV-2 prevalence was 5.3% in frontline healthcare employees and 5.3% among all employees. Of the 174 employees who tested positive and were followed, six (3.2%) reported COVID-related hospitalization, and one

DRAFT

employee was admitted to the ICU. No deaths were reported. The study authors suspected that community transmission likely played a major role in infection among healthcare employees early in the local epidemic and that similar percentages of infections in frontline and non-frontline healthcare employees support the PPE protocols implemented for frontline workers at the institution. In addition, positive cases were likely underestimated due to the focus on testing symptomatic employees.

Vahidy et al. (2020) studied asymptomatic infection rates among staff from a medical center consisting of seven hospitals in Texas and members of the surrounding community in March through April of 2020. Healthcare jobs with possible exposure to COVID-19 patients were classified into five categories, with varying levels of patient exposure: (1) nursing (e.g., nurses/nurses aids, emergency medical technicians), (2) clinicians (e.g., physicians, nurse practitioners), (3) allied healthcare workers (e.g., therapists, social workers), (4) support staff (e.g., security, housekeeping), and (5) administrative or research staff (e.g., managers, research assistants). A total of 2,872 asymptomatic individuals, including 2,787 healthcare personnel and 85 community residents, were tested for SARS-CoV-2 infection. Among the healthcare personnel tested, the prevalence of SARS-CoV-2 infection was 5.4% among the 1,992 patient-facing staff treating COVID-19 patients and 0.6% among the 625 patient-facing staff not treating COVID-19 patients. No cases were seen among the 170 nonclinical healthcare staff that did not interact with patients or in the 85 community residents (Vahidy et al., 2020). The nonclinical healthcare staff worked in buildings with separate heating, ventilation, and air conditioning systems, and with lower population density because of remote work when compared to clinical healthcare staff. In the different healthcare categories that cared for COVID-19 patients, prevalence of infection ranged from 3.6% to 6.5%, with no significant differences in the different

DRAFT

categories of healthcare workers. Therefore, the study indicates that healthcare workers providing both direct and indirect care to COVID-19 patients are at risk.

Nagler et al. (June 28, 2020), reported the results of SARS-CoV-2 testing in employees from the New York Langone Health system, an academic medical center encompassing four hospital campuses and over 250 ambulatory sites, with approximately 43,000 employees. Between March 25 and May 18, 2020, the health system tested employees who were symptomatic (4,150), were asymptomatic but exposed to COVID-19 (4,362), and asymptomatic employees who were returning to work after their services had been suspended during the peak of the epidemic (6,234). Among symptomatic employees, the COVID-19 positivity rate across the duration of the study was 33%. Among asymptomatic employees with self-reported exposure, the COVID-19 positivity rate was 8%. In asymptomatic employees returning to work, COVID-19 positivity rate was 3%. In all groups, the positivity rate in the first week of testing was substantially higher than in the last week of testing, which occurred more than a month after the first week. The study authors noted a temporal correlation of COVID-19 case declines in healthcare employees and the community, despite continued workplace exposure, and suggested that infections in healthcare employees may reflect importance of community transmission and efficacy of stringent infection control and PPE standards that remained largely unchanged since the start of the pandemic in March. OSHA finds that the study demonstrates the potential for COVID-19 to be introduced into the workplace from uncontrolled community spread and that the effective use of infection control practices and PPE most likely prevented transmission to healthcare employees.

Misra-Hebert et al. (September 1, 2020) conducted a retrospective cohort study to obtain data on rates of COVID-19 and risk factors for severe disease in healthcare employees and non-

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healthcare employees (neither category defined) who were tested for SARS-CoV-2, and listed in a registry at the Cleveland Clinic Health System, between March 8 and June 9, 2020. The data was drawn from healthcare employees from different segments of the country. Ninety percent of the healthcare employees and 75% of non-healthcare employees were from Ohio, and the remainder were from Florida. Although more healthcare employees than non-healthcare employees reported exposures to COVID-19 (72% vs. 17%), similar, and not significantly different, proportions of employees tested positive for COVID-19 in each group: 9% (551/6145) of healthcare employees and 6.5% (4353/66,764) of non-healthcare employees. OSHA finds it difficult to draw conclusions regarding this finding because the nature of the exposure (e.g., whether it was at close contact) was not explained. In fact, patient-facing healthcare employees (those having direct contact with patients) were 1.6 times more likely than non-patient-facing healthcare employees to test positive. The study authors suggested that the finding represents an increased risk of infection with work exposure, however they were not able to confirm if the exposure occurred 14 days prior to testing or if PPE was worn during the exposure. Positive cases peaked in early-to-mid April for both healthcare employees and non-healthcare employees (16% and 12%, respectively, as estimated from figure 2 of the study), and then decreased concurrently with the implementation of preventive measures, such as masking and physical distancing, over the course of the study. Of those who tested positive, 6.9% of healthcare employees and 27.7% of non-healthcare employees were hospitalized, and 1.8% and 10.8% respectively, were admitted to the intensive care unit. The study noted that the lower rates of hospitalization for the healthcare employee group could be explained on the basis that the healthcare employee population was younger and had fewer co-morbidities.

DRAFT

Kapoor et al. (2020) reported SARS-CoV-2 exposure risk and transmission rates among healthcare employees from Integrated Medical Professionals (IMP), an outpatient urology-centric multi-specialty independent practice, consisting of 50 locations in the New York metropolitan area. Over the 11-week period of the study, beginning on March 20, 2020, 254 tests for SARS-CoV-2 were performed (approximately 38% of all IMP clinical and administrative staff) on employees who had potential exposures. Trends for positive test rates in the employees showed a significant positive correlation with test rates for New York State. Positive test rates in the employees declined over time, from 26.1% in the early stage to 7.3% in the late stage of the study (72.2% decrease). The study authors reported that decreased risks of exposure and positive test results coincided with the implementation of infection control procedures (e.g., symptom screening, masking, distancing, and hygiene). Positivity rates were similar in administrative and clinical staff and the study authors concluded that "administrative staff in an outpatient setting were equally—if not more—vulnerable to SARS-CoV-2 transmission when compared with clinical staff who were more directly exposed to patients." When discussing possible reasons for the findings, the study authors speculated that clinical staff are more familiar than administrative staff with PPE and hand hygiene, and they noted that administrative staff, especially in check-in and check-out points, tend to work close to each other and may have contact with shared surfaces.

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*Serology Testing in Employees in Hospitals and Ambulatory Care Settings*

Although most of the studies described in this section relied on polymerase chain reaction (PCR) tests to detect cases of COVID-19, a number of studies conducted serology testing to determine how many individuals had been infected by the SARS-CoV-2 virus in the past. Serology tests determine if antibodies that respond to the SARS-CoV-2 virus are present in

samples of blood serum. Seroprevalence is the percentage of individuals in a population who have antibodies. Terms such as seropositive or seroconversion are often used to describe persons who have tested positive for the SARS-CoV-2 antibody. Most of the serology tests conducted looked at a type of antibody known as Immunoglobulin G (IgG). Seroprevalence studies provide a more complete picture of how many individuals in a population may have been infected because many individuals who were infected were not tested for current infections for reasons such as lack of symptoms and lack of available testing. Indeed, many individuals who were asymptomatic may be unaware that they were exposed to SARS-CoV-2 or had COVID-19 (CDC, July 6, 2020). The studies described below were conducted before vaccination began, and it is therefore unlikely that the studies are detecting antibodies produced as a result of vaccination.

Venugopal et al. (2020) conducted a cross-sectional study of healthcare employees across all hospital services (including physicians, nurses, ancillary services, and "others") who worked at a level one trauma center in the South Bronx, NY between March 1 and May 1, 2020. The period of analysis included the first few weeks of March, when New York City experienced a surge of infections that resulted in strained resources and supplies such as PPE. This hospital was so highly impacted that it was considered "the epicenter of the epicenter." Participants were tested for IgG antibodies. They were also tested for SARS-CoV-2. Of the 500 out of 659 healthcare employees who completed serology testing, 137 (27%) were positive for SARS-CoV-2 IgG antibodies. Seroprevalence was similar across the different types of healthcare employees (25% to 28%). The study authors indicated that seroprevalence in healthcare employees was higher than in the community, and that seroprevalence likely reflected healthcare and community exposures.

DRAFT

Sims et al. (November 5, 2020) conducted a prospective cohort serology study at Beaumont Health, which includes eight hospitals across the Detroit, MI metropolitan area. In April of 2020, during the peak of the pandemic's first wave, Michigan had the third highest number of cases in the U.S. and most cases were in the Detroit metropolitan area. All 43,000 hospital employees were invited to participate and seroprevalence was analyzed in 20,614 of them between April 13 and May 28, 2020. A total of 1818 (8.8%) of participants were seropositive. However, when separated according to employees working at home (n=1,868) versus working in their normal manner, employees working at home were significantly less likely to be seropositive (5.6%) than those going in to work (9.1%). The authors speculated that the seropositivity level for employees working at home was representative of the population sheltering at home and only leaving home when necessary. Participants involved with direct patient care had a higher seropositive rate (9.5%) than those who were not (7%). Healthcare employees with frequent patient contact (phlebotomy, respiratory therapy, and nursing) had a significantly higher seropositive rate (11%) than those with intermittent patient contact (physicians or clinical roles such as physical therapists, radiology technicians, etc.), who on average had a seropositive rate of 7.4%. The study authors speculated that the differences in these two groups may have been based on differences in both duration and proximity of exposure to patients. Another notable observation is that support personnel such as facilities/security and administrative support employees had seropositivity rates of approximately 7% to 8%, which were similar to rates in physicians (values estimated from Figure 2B). Participants reporting frequent contact with either 1) non-COVID-19 patients, or 2) physicians or nurses but not patients, had higher rates of seropositivity (7.6%) than those reporting no significant contact with patients, physicians, or nurses (but who handled patient samples) (6.5%).

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Moscola et al. (September 1, 2020) reported the prevalence of SARS-CoV-2 antibodies in healthcare employees from the Northwell Health System in the greater New York City area. The healthcare employees were offered free, voluntary testing at each of the system's 52 sites between April 20 and June 23, 2020. The analysis included 40,329 of the system's 70,812 employees and found that 5,523 (13.7%) were seropositive. The prevalence of SARS-CoV-2 antibodies was similar to that found in randomly-tested adults in New York state at that time (14%). Analysis of seropositivity by job type reported the highest levels of seropositivity (20.9%) in service maintenance staff (including housekeepers, groundskeepers, medical assistants, and 21 others), followed by 13.1% in nurses, 12.6% in administrative and clerical staff (including non-clinical professionals such as employees in information technology, human resources, medical records, and billing); 11.6% in allied health professionals (including clinical professionals such as physician assistants, physical therapists/occupational therapists, social workers, mental health professionals, pharmacists, and laboratory technicians), and 8.7% in physicians. Seropositivity rates were highest in employees from the emergency department and non-ICU hospital units (approximately 17% each), followed by "other" non-specified areas (12.1%), and ICU units (9.9%).

Wilkins et al. (2021) conducted a cross-sectional study to examine seropositivity rates in 6,510 healthcare workers from a Chicago healthcare system consisting of hospitals, immediate care centers, and outpatient practices. Blood samples were collected through July 8, 2020. The study authors then compared the seropositivity rate of different occupational groups of workers, using administrators as the referent group to reflect exposure consistent with non-healthcare workers. Overall seropositivity for all study participants was 4.8%. Before adjusting for demographics and self-reported out-of-hospital exposure to COVID-19, the study found that a

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number of healthcare occupations had a higher crude prevalence rate than the administrator group, including: 10.4% for support service healthcare workers; 10.1% for medical assistants; 9.3% for respiratory technicians; 7.6% for nurses; and 3.8% for administrators. After adjustment for demographics and self-reported out-of-hospital exposure to COVID-19, the only type of healthcare workers that continued to be significantly more likely to be seropositive than administrators were nurses, who were 1.9 times more likely to be seropositive. The study authors concluded that the higher work-related risk in nurses likely occurred as a result of frequent and close contact with patients. The study also compared seropositivity rates for different occupational tasks and found that adjusted seropositivity rates were higher for workers participating in the care of COVID-19 patients when compared with those who did not report participating in the care of COVID-19 patients. Being exposed to patients receiving high-flow oxygen therapy and hemodialysis was significantly associated with 45% and 57% higher odds for seropositive status, respectively.

*Studies Examining Risks After Known Exposures*

Heinzerling et al. (April 17, 2020) examined the development of COVID-19 in 120 healthcare employees who were unknowingly exposed to a patient with COVID-19. The patient was later identified as one of the first U.S. community cases of COVID-19, and Heinzerling et al. (April 17, 2020) concluded that the "investigation presented a unique opportunity to analyze exposures associated with SARS-CoV-2 transmission in a healthcare setting without recognized community exposures." Of the 120 healthcare employees who were exposed, 43 developed symptoms within 14 days of exposure and were tested for COVID-19. Three of those employees (7% of those tested) were positive for COVID-19. Although those three employees represent 2.5% of the total exposed, it is possible that more employees might have developed COVID-19

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because asymptomatic employees were not tested. The healthcare employees who became infected, when compared to those who were not infected, were more commonly present during two aerosol-generating procedures (nebulizer treatment (67% vs. 9%) and non-invasive ventilation (67% vs. 12%); more commonly performed physical examinations of the patient (100% vs. 24%); and were exposed to the patient for longer durations of time (median 120 minutes vs. 25 minutes). None of the exposed healthcare employees had been wearing the complete set of PPE recommended for contact with COVID-19 patients.

Aslam et al. (2020) reported the results of SARS-CoV-2 testing and contact tracing at the Memorial Sloan Kettering Cancer Center in the greater New York City area from March 22 to August 22, 2020. Patients at the facility were screened for COVID-19 before and after surgeries, interventional radiology procedures, and endoscopies. Contact tracing was performed in response to five of the patients who tested positive within 48 hours after their procedure. It was determined that 84 employees were in close contact with those 5 patients, but two had symptoms prior to the exposure. Forty-eight (59%) of the employees who had had close contact with the patients agreed to be tested for SARS-CoV-2, and all were screened for symptoms. Four employees tested positive. Based on PPE usage, other exposures, and timing, the authors suspected that 1 out of the 82 exposed healthcare employees who did not have COVID-19 before the exposure developed COVID-19 as a result of patient exposure (1.2%). One of the three other employees who tested positive was symptomatic before exposure occurred. The remaining two employees followed universal PPE guidance during contact with the patient, but were unprotected during contact with another healthcare employee. Therefore, unprotected contact with the healthcare employee was thought to be the probable source of transmission in those two employees. The authors concluded that three of the 82 (3.7%) healthcare employees who did not

DRAFT

have COVID-19 before they were exposed likely developed COVID-19 as a result of occupational exposure at the clinic, and the actual number may have been higher because only about half of the exposed employees were tested.

*Long-Term Care Facilities*

Long-term care facilities include nursing homes, skilled nursing facilities, and assisted living facilities. They provide both medical and personal care services to people unable to live independently. Because long-term care facilities are a congregate living situation, infections such as COVID-19 can spread rapidly between patients or residents and the healthcare staff who care for them. Therefore, employees who work at these facilities could have a high risk of exposure and infection. Like employees who work at hospitals, employees who work at long-term care facilities include both healthcare practitioners, who may have direct and close contact with patients and residents, as well as healthcare support staff who could be exposed to patients and residents or contaminated materials and waste. See the section on "*Detection of the Virus that Causes COVID-19 in Workers in Hospitals and Ambulatory Care Settings"* above for a description of the types of employees who may work at these facilities.

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McMichael et al. (March 27, 2020) investigated a COVID-19 outbreak affecting patients, employees, and visitors at a long-term care facility in King County, Washington in February of 2020. SARS-CoV-2 infections were identified in 129 persons, including 81 residents, 34 of 170 staff (20%), and 14 visitors. None of the employees died, but 2 of the 34 infected employees (5.9%) had symptoms severe enough to require hospitalization. The median age of the employees was 42.5 years (range 22-79 years). Job titles reported for the employees that were infected included physical therapist, occupational therapist assistant, environmental care worker, nurse, certified nursing assistant, health information officer, physician, and case manager. The

study authors noted that infection prevention procedures at the facility were insufficient, and they concluded that introduction of SARS-CoV-2 into long-term care facilities will result in high attack rates among residents, staff, and visitors.

Weil et al. (September 1, 2020) reported a cross-sectional study of skilled nursing facilities in the Seattle area between March 29 and May 13, 2020. Testing was performed by Public Health of Seattle and King County (testing of both residents and staff) or the Seattle Flu Study (testing of only employees). The authors described the period of the study to be at the peak of the pandemic, but the skilled nursing facilities were not experiencing outbreaks at the time of the study. Testing of employees for SARS-CoV-2 was voluntary, and 1,583 employees at 16 skilled nursing facilities were tested. Eleven of the 16 skilled nursing facilities had at least one resident or employee who tested positive. Forty-six (2.9%) employees had positive or inconclusive testing for SARS-CoV-2. Of 1208 residents tested, 110 (9.1%) were positive. Study authors noted shortages in PPE.

Yi et al. (September 7, 2020) evaluated surveillance data on COVID-19 for assisted living facilities in 39 states (representing 44% of the total long-term care facilities in the U.S.). The states began reporting data at various periods ranging from February 27 to April 30, 2020. As of October 15, 2020, 6,440 of 28,623 (22%) assisted living facilities had at least one COVID-19 case among residents or staff (ranging from 1.3% of assisted living facilities in Iowa to 92.8% of assisted living facilities in Connecticut). In 22 states, 17,799 cases of COVID-19 were reported in staff (total number of staff not specified). In 9 states, 46 of 7,128 (0.6%) employees with COVID-19 died.

Bagchi et al. (2021) reported on the CDC's National Healthcare Safety Network (NHSN) surveillance of nursing homes, which began on April 26, 2020. As of May 25, 2020, the Centers

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for Medicare & Medicaid Services (CMS) began requiring nursing homes to report COVID-19 cases in residents and staff. The authors analyzed data in residents, nursing home staff, and facility personnel that was reported from May 25 through November 22, 2020 in all 50 states, the District of Columbia, Guam, and Puerto Rico. Staff members and facility personnel were defined as "all persons working or volunteering in the facility, including contractors, temporary staff members, resident caregivers, and staff members who might work at multiple facilities." The study authors reported that "case count data were aggregated weekly, and resident-weeks were calculated as the total number of occupied beds on the day data were reported." Data on number of staff members employed were not collected, and therefore "resident weeks" was used as "a closest best estimate of the at-risk denominator for staff members." The study authors indicated that "cases per 1,000 resident-week were calculated for residents and staff members using the number of COVID-19 cases reported in a week over the corresponding 1,000 resident-weeks." COVID-19 cases in staff members increased during June and July (10.9 cases per 1,000 resident-weeks reported in the week of July 26); declined during August and September (6.3 per 1,000 resident-weeks in the week of September 13); and increased again by late November (21.3 cases per 1,000 resident-weeks in the week of November 22). The study authors noted that COVID-19 rates among nursing home staff followed similar trends in nursing home residents and the surrounding communities, thereby indicating a possible association between COVID-19 rates in nursing homes and nearby communities.

Terebuh et al. (September 20, 2020) investigated COVID-19 clusters in 45 congregate living facilities in Ohio, from March 7 to May 15, 2020. Most of the facilities investigated are considered healthcare worksites under this standard. More than half of the clusters occurred at the medical facilities (51% at nursing homes, 11% at assisted living facilities, 7% at treatment

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facilities, and 2% at intermediate care facilities). The remaining clusters occurred at corrections facilities (7%), group homes (20%), and shelters (2%). Of the combined 598 residents and healthcare employees who were either confirmed to have COVID-19 or identified as a probable case based on symptoms and close contact with a confirmed case, healthcare employees represented 167 (28%) of the confirmed and 37 (6%) of the probable cases of COVID-19. None of the healthcare employees died. The study authors were able to identify the index case in 25 of the clusters, and 88% of the index cases were determined to be healthcare employees.

*Studies Focusing on Laboratories and Healthcare Support Services*

Laboratory employees and healthcare support services employees, such as personnel that provide food, laundry, or waste-handling services, are at risk of exposure to SARS-CoV-2 and contracting COVID-19. Employees in biomedical laboratories may have contact with contaminated laboratory equipment, and improperly-stored specimens can pose a risk of exposure via inhalation, contact, or ingestion. Studies conducted outside the U.S. have reported outbreaks among laboratory personnel, and demonstrate the potential for outbreaks in U.S. laboratories. Employees who provide healthcare support services usually have less direct contact with patients, but they can have contact with surfaces, materials, waste, or specimens that are contaminated with SARS-CoV-2. SARS-CoV-2 is known to remain infectious on surfaces for at least three days (Van Doremalen et al., April 16, 2020) and is found in respiratory and fecal specimens (Wang et al., March 11, 2020). In addition, both laboratory and healthcare support employees can have close and prolonged contact with their co-workers while performing their duties.

One study discussed above (Sims et al., November 5, 2020), shows an infection rate among healthcare support services employees that is similar to healthcare employees, such as

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physicians, who have some patient contact. As noted, support personnel such as facilities/security and administrative support employees had seropositivity rates of approximately 7% to 8%, which were similar to rates in physicians (values estimated from Figure 2B). Both healthcare support employees and physicians had seropositivity rates that were higher than the rates among employees working from home.

Opperman et al. (August 25, 2020) investigated a COVID-19 outbreak at a diagnostic laboratory in Cape Town, South Africa on April 24, 2020. Three staff members initially tested positive and an additional nine tested positive within seven days. One laboratory staff member with risk factors for severe disease died from complications due to COVID-19.

Zuckerman et al. (August 5, 2020) conducted a retrospective study to investigate a small-scale SARS-CoV-2 outbreak where six staff members were infected in Israel's central virology laboratory in mid-March 2020. Phylogenetic analysis clarified transmission events, confirming that the first infected staff member identified infected at least three other staff members. Based on the results of surface wipe tests and PCR analysis for the virus, the study authors concluded that the route of transmission was unlikely to be from contact with laboratory surfaces; instead, person-to-person contact in the laboratory was the likely cause of transmission. These cases were the first laboratory-acquired SARS-CoV-2 infections in the world to be documented in the peer-reviewed literature.

Wong et al. (July 4, 2020) conducted a risk assessment to determine SARS-CoV-2 exposure hazards from various processes performed in clinical laboratories. Mixing and transferring samples inside a biosafety cabinet was found to generate aerosols, and therefore was determined to pose a risk for infection. Contamination by gloved hands was considered a major exposure route for SARS-CoV-2, illustrating the importance of proper removal of PPE.

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Studies conducted outside the U.S. with SARS-CoV-1, a similar strain of coronavirus, demonstrate the potential for infection via contact transmission. In 2004, a laboratory researcher in Taiwan was diagnosed with a laboratory-confirmed case of SARS-CoV-1 (Orellana, 2004). The infection was believed to have occurred via contact transmission while the employee cleaned liquids that had spilled at the biosafety level 4 laboratory where he worked. SARS-CoV-1 was later determined to have colonized the cleaning materials used by the employee. Similarly, in Beijing, two graduate students at a laboratory known to conduct research on SARS were reported as laboratory-confirmed SARS-CoV-1 cases (CDC, May 19, 2004). The cause was later determined to be incomplete inactivation of SARS-CoV-1 in the laboratory. One of the cases was later implicated in seven cases of community-acquired SARS-CoV-1. These episodes demonstrate the potential not only for lab employees to be infected at work, but for a laboratory-acquired case of SARS-CoV-2 to have implications for further transmission and illness.

Hale and Dayot (2020) examined an outbreak of COVID-19 among food service employees that occurred in an academic medical center before masking and physical distancing requirements were implemented. After an employee in the food and nutrition department tested positive, 280 asymptomatic staff were tested. The entire food and nutrition department that was actively working was considered exposed because employees shared a common locker room and break area. Therefore, testing was not limited to employees who worked near the index case as part of their duties. Ten staff members in the department (including the index case) tested positive during the investigation. At least seven of the cases were thought to result from transmission from the index case.

Outbreaks for support services have not been well documented and may be encapsulated with incidents for the entire hospital. Local newspaper reports have identified potential incidents

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in laundry facilities that handle linens contaminated with SARS-CoV-2. In June, it was reported that an off-site laundry facility that serviced several Denver area hospitals was impacted by a COVID-19 outbreak that stretched across two shifts (Brown, June 11, 2020). The source was never determined, but could have been from contaminated materials or community transmission. In a New Jersey unionized laundry facility, representatives noted that eight employees had been infected with SARS-CoV-2 and demanded improvements in infectious disease control implementation (Davalos, December 21, 2020). In Canada, a Regina hospital laundry plant was connected with an 18-employee outbreak (Martin, August 10, 2020). The cause of the outbreak was not determined.

*Emergency Medical Services (EMS)*

A limited number of studies have examined the impact of COVID-19 on employees who provide EMS (e.g., EMTs, paramedics), who are considered healthcare personnel under this standard. The studies that address EMS often address personnel such as EMTs along with other types of emergency responders such as firefighters, who are not considered healthcare personnel under this standard. EMTs and similar occupations, such as paramedics, have close contact with patients who are or could be infected with SARS-CoV-2 when they provide medical care or transport those patients. The medical care they provide includes intubation and cardiopulmonary resuscitation, which could generate aerosols and put them at particularly high risk.

Prezant et al. (2020) reviewed paid medical leave data for EMS providers and firefighters using New York City fire department electronic medical records from October 1, 2017 through May 31, 2020. The study authors found that as of May 31, 2020, 1,792 of 4,408 EMS providers (40.7%) had been on leave for suspected or confirmed COVID-19. When compared with the medical leave data from before the pandemic—including months during influenza periods in

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prior years—the authors found that medical leave for EMS providers was 6.8% above baseline in March 2020 and peaked at 19.3% above baseline in April 2020. The authors determined that COVID-19 was responsible for this increase. The medical leave levels for EMS providers were above those for firefighters. Among firefighters, the data showed that 34.5% had been on leave for suspected or confirmed COVID-19 as of May 31, 2020, and there was a peak in medical leave at 13.0% above baseline in April 2020. A total of 66 (1.2%) firefighters and EMS providers with COVID-19 were hospitalized and 4 died. Despite EMS providers having been given the same PPE (not further specified) as firefighters, EMS providers had higher rates of COVID-19. The study authors concluded that higher rates in EMS providers were attributable to greater exposure to COVID-19 patients while administering medical care.

Weiden et al. (January 25, 2021) investigated risk factors for SARS-CoV-2 infection and severe disease (hospitalization or death) in New York City first responders (EMS and firefighters) from March 1 through May 31 2020, based on medical records. The study had a total of 14,290 participants (3,501 EMS personnel and 10,789 firefighters). From March 1 to May 31, 2020, 9,115 (63.8%) responders had no COVID-19 diagnosis, 5,175 (36.2%) were confirmed or suspected COVID-19 cases, and 62 (0.4%) were hospitalized. Three participants died in a hospital, and one died at home. Researchers found that EMS respondents had more cases of severe COVID-19 than firefighters (42/3501 [1.2%] vs. 21/10,789 [0.19%]). The SARS-CoV-2 infection rate among New York City first responders overall was 15 times the New York City rate. EMS personnel had a 4-fold greater risk of severe disease and 26% increased risk of confirmed COVID-19 cases when compared with firefighters. Both firefighters and EMS personnel responded to the pandemic-related emergency medical calls and followed the same PPE protocols. However, EMS personnel had greater COVID-19 exposure than firefighters due

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to greater COVID-19-related call volume and being solely responsible for patient transport, nebulization of bronchodilators, and intubation.

Tarabichi et al. (October 30, 2020) recruited first responders (from EMS and fire departments) in the Cleveland, Ohio area. The authors conducted a first serologic survey and virus test in the period between April 20 through May 19, 2020 and a second between May 18 and June 2, 2020. A total of 296 respondents completed a first visit and 260 completed the second visit. Seventy-one percent of respondents reported exposure to SARS-CoV-2 and 16 (5.4%) had positive serological testing. No subject had a positive virus test. Fifty percent (8/16) of those who tested positive were either asymptomatic or mildly symptomatic. Based on responses to questions about suspected contacts (it does not appear that the time period of exposure was considered), the study author concluded that likely sources of transmission in participants who tested positive were patients or co-workers.

In a study examining COVID-19 antibodies in employees from public service agencies in the New York City area from May through July of 2020, 22.5% of participants were found to have COVID-19 antibodies (Sami et al., March 2021). The percentages of EMTs and paramedics found to have antibodies (38.3 and 31.1%) were among the highest levels observed in all the occupations. The study authors noted that risk of exposures may be increased for employees who provide emergency medical services because those services are provided in uncontrolled, unpredictable environments, where space is limited (e.g., ambulances) and quick decisions must often be made. Both emergency technicians and paramedics perform procedures such as airway management that involve a high risk of exposure. In fact, the proportions of employees who had antibodies were found to be increased with increasing frequency of aerosol generating procedures.

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*In-Home Healthcare Providers*

In-home healthcare workers provide medical or personal care services, similar to those provided in long-term care facilities, inside the homes of people unable to live independently. Patients receiving in-home care could receive services from different types of healthcare providers (e.g., a nurse administering medical care, a physical therapist assisting with exercise, a personal care services provider assisting with daily functions such as bathing). In addition, a number of workers may provide services to the same patient, while working in shifts over the course of the day. In-home healthcare providers have a high risk of infection from working close to patients and possibly their family members or other caregivers in enclosed spaces (e.g., performing a physical examination, helping the patient bathe) or handling contaminated materials and waste.

The impact of COVID-19 on in-home healthcare workers is not well studied. In-home healthcare workers might be included in reports of COVID-19 cases and deaths in healthcare workers, but those reports do not indicate if any of the affected healthcare workers provided home care. One report from the UK indicated that an occupational category of "social care" which included "care workers and home carers" experienced significantly increased rates of death involving COVID-19 (50.1 deaths per 100,000 men and 19.1 deaths per 100,000 women) from March through May of 2020 (Windsor-Shellard et al., June 26, 2020). And in a related study from March through December of 2020, it was reported that nearly three in four deaths involving COVID-19 in social care operations were in "care workers and home carers," with 109.9 deaths per 100,000 men and 47.1 deaths per 100,000 women (Windsor-Shellard et al., January 25, 2021).

*Conclusion for Healthcare and Associated Industries*

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The representative studies OSHA described in this section on healthcare and associated industries provide examples of the pervasive impact that SARS-CoV-2 exposures have had on employees in those industries. The evidence is consistent with OSHA's determination that SARS-CoV-2 poses a grave danger to employees in these industries. Cases or outbreaks in settings such as hospitals, long-term care facilities, ambulatory care settings, laboratories, and emergency services departments have had a clear impact on employees in those types of workplaces. The evidence establishes that employees in those settings, whether they provide direct patient care or supporting services, have been infected with SARS-CoV-2 and have developed COVID-19. Some of these employees have died and others have become seriously ill. Employees in healthcare and associated industries are at elevated risk for transmission in the workplace. Employees in these industry settings are exposed to these forms of transmission through in-person interaction with patients, their co-workers, and/or the public, as well as through contact with contaminated materials. In many cases, close contact with people who are suspected or confirmed to have COVID-19 is required of personnel in these types of workplaces, and such close contact usually occurs indoors. These employees, who form the backbone of the nation's medical response to the COVID-19 public health emergency, clearly require protection under this ETS.

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**iv. Conclusion**

OSHA finds that employees face a grave danger from exposure to SARS-CoV-2 in every shared workplace in the United States. OSHA's determination is based on three separate manifestations of incurable, permanent, or non-fleeting health consequences of exposure to the virus, each of which is independently supported by substantial evidence in the record. The danger to employees is further supported by powerful lines of evidence demonstrating the high transmissibility of the virus in the workplace and the sheer prevalence of infections in employee populations.

With respect to the grave health consequences of exposure to SARS-CoV-2, OSHA has found, first, that regardless of where and how exposure occurs, COVID-19 can result in death. The risk of death from COVID-19 is especially high for employees who have underlying health conditions, older employees, and employees who are members of racial and ethnic minority groups, who together make up a significant proportion of the working population. Second, even for those who survive a SARS-CoV-2 infection, the virus often causes serious, long-lasting, and

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potentially permanent health effects. Serious cases of COVID-19 require hospitalization and dramatic medical interventions, and might leave employees with permanent and disabling health effects. Third, even mild or moderate cases of COVID-19 that do not require hospitalization can be debilitating and require medical care and significant time off from work for recovery and quarantine. People who initially appear to have mild cases can suffer health effects that continue months after the initial infection. Even asymptomatic cases, or mere exposures, can have a substantial impact on employees to the extent they need to take significant time off from work for quarantine. Furthermore, racial and ethnic minority groups are at increased risk of SARS-CoV-2 infection, as well as hospitalization and death from COVID-19.

Each of these three categories of health consequences independently poses a grave danger to individuals exposed to the virus. That danger is amplified for employees because of the high potential for transmission of the virus in shared work environments. The best available evidence on the science of transmission of the virus makes clear that SARS-CoV-2 is transmissible to all vulnerable persons in shared work settings, which can result in large-scale clusters of infections. Transmission is most prevalent in situations where people are close to each other, in enclosed areas, for extended periods of time. This scenario occurs in most workplaces across the nation, and can be exacerbated by, for example, poor ventilation, close contact with people who are suspected or confirmed to have COVID-19, and situations where aerosols containing SARS-CoV-2 particles are likely to be generated. Importantly, while older employees and those with underlying health conditions face a higher risk of dying from COVID-19 once infected, fatalities are certainly not limited to that group. It is impossible to know whether any given workplace exposure will result in an asymptomatic SARS-CoV-2 infection, or whether the consequences will be fatal to the employee. Thus, every workplace exposure or transmission has the potential

DRAFT

to cause severe illness or even death. Taken together, the multiple, severe health consequences of COVID-19 and the evidence of its transmission in environments characteristic of most workplaces demonstrate that exposure to SARS-CoV-2 represents a grave danger to employees in nearly every workplace in the country.

The existence of a grave danger to employees from SARS-CoV-2 is further supported by the toll the pandemic has already taken on the nation as a whole. Although OSHA cannot estimate the number of workers in our nation who contracted COVID-19 at work and became sick or died, COVID-19 has killed more than 530,000 people in the United States as of March 16, 2021 (CDC, March 16, 2021). That death toll includes 68,760 people who were 18 to 64 years old. Current mortality data shows that people of working age have a 1 in 227 chance of dying when they contract COVID-19. At least 28 million people in the United States have gotten sick, and tens of thousands of new cases are identified daily. One in eleven reported cases of COVID-19 becomes severe and requires hospitalization. Moreover, public health officials agree that these numbers fail to show the full extent of the deaths and illnesses from this disease, for which racial and ethnic minority groups are disproportionately represented among COVID-19 cases, hospitalizations, and deaths (CDC, March 4, 2021; Escobar et al., 2021; Gross et al., 2020; McLaren, 2020). Given this context, OSHA is confident in its finding that exposure to SARS-CoV-2 poses a grave danger to employees.

The above analysis fully satisfies the OSH Act's requirements for finding a grave danger. Although OSHA usually performs a quantitative risk assessment before promulgating a health standard under section 6(b)(5) of the OSH Act, 29 U.S.C. 655(b)(5), that type of analysis is not necessary in this situation. OSHA has most often invoked section 6(b)(5) authority to regulate exposures to chemical hazards involving much smaller populations, many fewer cases,

DRAFT

extrapolations from animal evidence, long term exposure, and delayed effects. In those situations, mathematical modelling is necessary to evaluate the extent of the risk at different exposure levels. The gravity of the danger presented by a disease with acute effects like COVID-19, on the other hand, is made obvious by a straightforward count of deaths and illnesses caused by the disease, which reach sums not seen in a century. The evidence compiled above amply support OSHA's finding that SARS-CoV-2 presents a grave danger in American workplaces. In the context of ordinary 6(b) rulemaking, the Supreme Court has said that the OSH Act is not a "mathematical straitjacket," nor does it require the agency to support its findings "with anything approaching scientific certainty," particularly when operating on the "frontiers of scientific knowledge." *Indus. Union Dep't, AFL-CIO v. Am. Petroleum Inst.*, 448 U.S. 607, 656, 100 S. Ct. 2844, 2871, 65 L. Ed. 2d 1010 (1980). This is true *a fortiori* here in the current national crisis where OSHA must act quickly to ensure employees are adequately protected from the new hazard presented by the COVID-19 pandemic.

The grave danger from SARS-CoV-2 represents the biggest threat to employees in OSHA's more than 50-year history. The threat applies to employees in all sectors covered by OSHA, including general industry, construction, maritime, agriculture, and healthcare and healthcare-associated industries. Having made the determination of grave danger, as well as the determination that an ETS is necessary to protect employees from exposure to SARS-CoV-2 (see "Need for the ETS," also in Section IV of this preamble), OSHA is required to issue this standard to protect employees from getting sick and dying from COVID-19 acquired at work. *See* 29 U.S.C. 655(c)(1).

DRAFT

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**B. Need for the ETS**

*i. Events Leading to the ETS*

Since January 2020, OSHA has received numerous petitions and supporting letters from members of Congress, unions, advocacy groups, and one group of large employers urging the agency to take immediate action by issuing an ETS to protect employees from exposure to the virus that causes COVID-19 (Scott and Adams, January 30, 2020; NNU, March 4, 2020; AFL-CIO, March 6, 2020; Menendez, March 9, 2020; Wellington, March 12, 2020; DeVito, March 12, 2020; Carome, March 13, 2020; SMART, March 30, 2020; Blumenthal, April 8, 2020; Murray et al., April 29, 2020; Luong, April 30, 2020; Novoa, June 24, 2020; Solt, April 28, 2020; Castro et al., April 29, 2020; Talbott and Adely, May 4, 2020; Public Citizen, March 13, 2020; LULAC, March 31, 2020; Meuser, May 1, 2020; Raskin, April 29, 2020; Cartwright et al., May 7, 2020; Frosh, May 12, 2020; Pellerin, March 19, 2020; Yborra, March 19, 2020; Owen, March 19, 2020; Brown et al., April 30, 2020; Price et al., May 1, 2020; ORCHSE, October 9, 2020). These petitions and supporting letters argue that many employees have been infected

DRAFT

because of workplace exposures to the virus that causes COVID-19 and immediate, legally enforceable action is necessary for protection. OSHA quickly began issuing detailed guidance documents and alerts beginning in March 2020 that helped determine employee risk levels of COVID-19 exposure and recommendations for appropriate controls.

On March 18, 2020, OSHA Principal Deputy Assistant Secretary Loren Sweatt responded to an inquiry from Congressman Robert C. "Bobby" Scott, Chairman of the House Committee on Education and Labor, regarding OSHA's response to the COVID-19 outbreak (OSHA, March 18, 2020). In the letter, she stated that OSHA had "a number of existing enforcement tools" it was using to address COVID-19, including existing standards such as Personal Protective Equipment (PPE), Respiratory Protection, and Bloodborne Pathogens, as well as the General Duty Clause, 29 U.S.C. 654(a)(1). OSHA also stated that it was working proactively to assist employers by developing guidance documents. OSHA stated that, given the existing enforcement tools, "we currently see no additional benefit from an ETS in the current circumstances relating to COVID-19," and that "OSHA can best meet the needs of America's workers by being able to rapidly respond in a flexible environment."

Shortly after OSHA's announcement that it did not intend to pursue an ETS at that time, the American Federation of Labor and Congress of Industrial Organizations (AFL-CIO), the country's largest federation of labor unions, filed an emergency petition with the U.S. Court of Appeals for the D.C. Circuit, for a writ of mandamus to compel OSHA to issue an ETS for COVID-19, arguing that OSHA's failure to issue legally enforceable COVID-19-specific rules endangered workers (AFL-CIO, May 18, 2020). On May 29, 2020, OSHA denied the AFL-

DRAFT

CIO's pending March 6 petition to OSHA for an ETS[8] and simultaneously filed a response brief with the D.C. Circuit, arguing the AFL-CIO was not entitled to a writ of mandamus (DOL, May 29, 2020). The agency stated that the union had not clearly and indisputably demonstrated that an ETS was necessary and repeated its assertion that an ETS was not necessary at that time because of the agency's two-pronged strategy for addressing COVID-19 in the workplace: enforcement of existing standards and section 5(a)(1) of the OSH Act (the General Duty Clause), as well as development of rapid guidance to provide a flexible response to new and evolving information about the virus. On June 11, 2020, the U.S. Court of Appeals for the D.C. Circuit issued a one paragraph *per curiam* order denying the AFL-CIO's petition, finding that OSHA's "decision not to issue an ETS is entitled to considerable deference," and "[i]n light of the unprecedented nature of the COVID-19 pandemic, as well as the regulatory tools that the OSHA has at its disposal to ensure that employers are maintaining hazard-free work environments, . . . the OSHA reasonably determined that an ETS is not necessary at this time." *In re Am. Fed'n of Labor & Cong. of Indus. Orgs.*, No. 20-1158, 2020 WL 3125324 (D.C. Cir. June 11, 2020), *rehearing en banc denied* (AFL-CIO, July 28, 2020).[9]

DRAFT

[8] The AFL-CIO had petitioned OSHA on March 6 to issue an ETS to protect working people from occupational exposure to infectious diseases broadly, including COVID-19 (AFL-CIO, March 6, 2020). In OSHA's May 29, 2020 denial, the agency concluded that it lacked compelling evidence to find that an undefined category of infectious diseases generally posed a grave danger for which an ETS was necessary (OSHA, May 29, 2020). With respect to COVID-19 specifically, the agency made no conclusion as to whether the disease posed a grave danger to workers, but concluded, as it had in the earlier March 18, 2020 response to congressional inquiry, that a COVID-19 ETS was not necessary at that time (id.).

[9] On October 29, 2020, a group of petitioners including the American Federation of Teachers (AFT), the American Federation of State, County and Municipal Employees, the Washington State Nurses Association, and the United Nurses Association of California/Union of Health Care Professionals filed a separate petition for a writ of mandamus from the U.S. Court of Appeals for the Ninth Circuit to compel OSHA to issue a permanent standard to protect healthcare workers from the risks of infectious diseases (AFT, October 29, 2020). On December 31, 2020, OSHA filed a response brief asserting that the petitioners were not entitled to the requested writ of mandamus (DOL, December 31, 2020). OSHA explained that, while the agency has been considering the need for an infectious disease standard for healthcare workers since at least 2009, it has not yet made a final determination on the necessity of such a standard, and that the agency's limited resources at this time are best directed toward responding to the broader COVID-19 crisis. The Ninth Circuit granted the parties' request to stay the case because OSHA now intends to prioritize the infectious disease rulemaking.

Following OSHA's decision not to issue an ETS in May, some States and local health departments determined enforceable regulation was necessary, leading to the adoption of a variety of executive orders and emergency regulations with specific worker protection requirements. By the end of 2020, Virginia, Oregon, California, Michigan, New Jersey, New Mexico, Utah, Washington, and Kentucky have each issued an ETS or similar emergency rule or executive order with enforceable requirements to protect workers (see Section VII, Additional Requirements, for a full discussion of OSHA-approved State Plans), and many additional states and localities have issued other kinds of guidelines and protective ordinances for workers. Other states and localities have not. The resulting patchwork of state and local regulations led to inadequate and varying levels of protection for workers across the country, and has caused problems for many businesses. As a result, on October 9, 2020, ORCHSE Strategies, LLC (since acquired by the National Safety Council (NSC))—a group of more than 100 large (mostly Fortune 500) companies in over 28 industries—petitioned OSHA to issue an ETS, recognizing that OSHA had provided "very well prepared and thoughtful" guidance, but concluding an ETS is still needed and that the lack of a uniform response has caused confusion and unnecessary burden on workplaces already struggling (ORCHSE, October 9, 2020).

As of the end of 2020, the agency had issued citations for COVID-19-related violations of existing OSHA requirements, following 294 inspections, primarily of healthcare facilities including nursing homes (OSHA, January 14, 2021). Violations have included, among other things, failure to properly develop written respiratory protection programs; failure to provide a medical evaluation, respirator fit test, training on the proper use of a respirator, and personal protective equipment; failure to report an injury, illness, or fatality; failure to record an injury or illness on OSHA recordkeeping forms; and failure to comply with the General Duty Clause of

DRAFT

the OSH Act. In addition, OSHA issued over 150 Hazard Alert Letters (HALs) where it found COVID-19-related hazards during workplace inspections, but did not believe it had sufficient basis to cite the employer for violating an existing OSHA standard or the General Duty Clause.

On January 21, 2021, the President issued Executive Order 13999, entitled "Protecting Worker Health and Safety" (86 FR 7211). In it, he declared that:

> Ensuring the health and safety of workers is a national priority and a moral imperative. Healthcare workers and other essential workers, many of whom are people of color and immigrants, have put their lives on the line during the coronavirus disease 2019 (COVID–19) pandemic. It is the policy of my Administration to protect the health and safety of workers from COVID–19. The Federal Government must take swift action to reduce the risk that workers may contract COVID–19 in the workplace.

He further directed OSHA to take a number of steps to better protect workers from the COVID-19 hazard, including issuing revised guidance on workplace safety, launching a national emphasis program to focus OSHA enforcement efforts on COVID-19, conduct a multilingual outreach program, and evaluate its COVID-19 enforcement policies (id.). In addition, the President directed OSHA to "consider whether any emergency temporary standards on COVID-19, including with respect to masks in the workplace, are necessary, and if such standards are determined to be necessary, issue them by March 15, 2021" (id.).

In accordance with this executive order, OSHA has reviewed its May 2020 decision not to issue an ETS. For the reasons explained below, OSHA does not believe its prior approach—enforcement of existing standards and the General Duty Clause coupled with the issuance of nonbinding guidance— has proven over time to be adequate to meet the "national priority" and "moral imperative" of taking "swift action to reduce the risk that workers may contract COVID-19 in the workplace" articulated in Executive Order 13999. Given the grave danger presented by the hazard, OSHA now finds that this standard is necessary to protect employees. *See Nat'l Cable & Telecomm. Ass'n v. Brand X Internet Svcs*, 545 U.S. 967, 981 (2005) (noting that an

DRAFT

agency must "consider the wisdom of its policy on a continuing basis . . . for example, in response to changed factual circumstances, or a change in administrations"); *Asbestos Info. Ass'n*, 727 F.2d at 423 (5th Cir. 1984) ("failure to act does not conclusively establish that a situation is not an emergency . . . [when there is a grave danger to workers,] to hold that because OSHA did not act previously it cannot do so now only compounds the consequences of the Agency's failure to act.").

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DRAFT

*ii. No other agency action is adequate to protect employees against grave danger.*

For the first time in its 50-year history, OSHA faces a "new hazard" so grave that it has killed more than half a million people in the United States in barely over a year, and sickened millions more. COVID-19 can be spread whenever an infected person exhales. Although many infected people have no symptoms and are unaware that they are infected, they can and do transmit this disease to co-workers or other individuals working in businesses they visit (Johansson et al., January 7, 2021). Those other employees, once infected, could end up unable to breathe without ventilators or suffer from failure of multiple body organs, and are at risk of death or long-term debilitation. As a result, OSHA is now facing the most serious workplace

hazard in its history, creating the precise situation the ETS provision was enacted to address. An ETS is necessary to protect employees from this hazard.

When it decided not to issue an ETS last spring, OSHA determined that sufficient employee protection against COVID-19 could be provided through the agency's enforcement of existing workplace standards and the General Duty Clause of the OSH Act, coupled with the issuance of industry-specific, non-mandatory guidance. However, in doing so OSHA indicated that its conclusion that an ETS was not necessary was specific to that time, and that the agency would continue to monitor the situation and take additional steps as appropriate (see, e.g., OSHA, March 18, 2020 Letter to Congressman Scott (stating "[W]e *currently* see no additional benefit from an ETS in the *current* circumstances relating to COVID-19. OSHA is *continuing to monitor* this quickly evolving situation and will take the appropriate steps to protect workers from COVID-19 in coordination with the overall U.S. government response effort." (emphasis supplied)); DOL May 29, 2020 at 20 (stating "OSHA has determined this steep threshold [of necessity] is not met here, at least not *at this time*." (emphasis supplied))). Whatever the merits of the decision not to promulgate an ETS at that time, OSHA's subsequent experience has shown that a new approach is needed to ensure the protection of the American workforce from the grave danger posed by the COVID-19 pandemic.

At the outset, employers do not have a reliance interest in its OSHA's prior decision not to issue an ETS on May 29, 2020, which did not alter the status quo or require employers to change their behavior. *See Dep't of Homeland Security v. Regents of the Univ. of California*, 140 S. Ct. 1891, 1913-14 (2020). As OSHA indicated when it made the decision, the determination was based on the conditions and information available to the agency at that time and was subject to change as worsening conditions and additional information indicated the need for an ETS. In

DRAFT

light of the agency's express qualifications and the surrounding context, any employer reliance would have been unjustified and could not have outweighed the countervailing urgent need to protect employee health and safety.

Multiple developments support a change in approach. First, there has been a significant increase in COVID-19 deaths and infections. When OSHA decided not to promulgate an ETS in May 2020, the COVID-19 death toll was reaching 100,000 (CDC, May 28, 2020), and an average of 6,000 – 7,000 people were dying each week (CDC, February 23, 2021a), down from the over 17,000 weekly deaths in mid-April (CDC, February 23, 2021a). The situation is vastly different today, when over half a million Americans have died from COVID-19 with an average of over 3,000 Americans dying every day from mid-January 2021 through the first week in February (CDC, February 23, 2021b).

Unlike in April 2020, when 30,000 new cases a day were being reported, that rate grew to over 314,000 on January 8, 2021, with over 100,000 *each day* from mid-January through the first week of February 2021 (CDC, February 23, 2021b). More infections mean more potential for exposures, including in workplaces. While infection rates have slowed in recent weeks, a grave danger still exits. Indeed, the 7-day moving average is still higher as of March 15, 2021 (54,239 confirmed cases per day) than it was on May 29, 2020 (20,401 confirmed cases per day; CDC, March 16, 2021). And some variability in infection rates in a pandemic is to be expected. While the curves of new infections and deaths can bend down after peaks, they often reverse course only to reach additional peaks in the future (Moore et al., April 30, 2020). Several new mutations – or variants – of the virus, preliminarily understood to be more contagious than the original, are now spreading in this country. As President Biden said on March 11, continued

DRAFT

vigilance is necessary, and this is not the time to give up on the mitigation measures. Many of the measures he referenced in that speech are required by this ETS.

And, as discussed in more detail in the *Grave Danger* section (Section IV.A of this preamble), while vaccines have been developed, there is ongoing work to distribute them in the United States, and more work is needed to build confidence among Americans in the vaccines so that enough people are protected to bring the virus under control. Further, as more people are vaccinated, the threat perception may be reduced so that even unvaccinated people begin to return to workplaces in greater numbers, which could potentially increase workplace hazards. Experts have expressed concern that one or more subsequent waves of COVID-19 may be possible in 2021 (Moore et al., April 30, 2020). Without sufficient vaccination and mitigation measures in place, another wave may be possible during the spring of 2021 (Rutherford in Bai and Marks, 2021), especially with new variants of COVID-19 in circulation (Doughton, February 9, 2021).

Further, OSHA's actual enforcement experience over the past year—which had only just begun when OSHA announced its previous views on the need for an ETS—has demonstrated that existing enforcement options are not efficient or effective. As described in more detail below, OSHA continues to observe inadequate protection from COVID-19 exposure. OSHA also continues to receive hundreds of employee complaints every week asking for investigations of workplaces where employees do not believe they are being adequately protected and that there is widespread non-compliance with the guidance issued by the agency and the CDC. Together, OSHA and its State Plan partners have received more than 60,000 COVID-related complaints since last March (OSHA, February 22, 2021). In all, federal OSHA has received 13,791 procedurally valid complaints related to COVID-19 since February 1, 2020.

DRAFT

The following narratives are just a few examples of the kinds of complaints OSHA continues to receive from employees on a regular basis. The narratives were extracted from the OSHA Information System (OIS), and only include complaints submitted through the OSHA online complaint system to reduce the need for paraphrasing by OSHA staff. The list also only includes complaints to federal OSHA; OSHA State Plan complaints are not included.

Received 12/29/2020

NAIC 238140 - masonry work, stone setting, brick laying, and other stone work.

15 office staff exposed to Covid-19. In November, one employee became ill with covid and had close contact with office staff. Staff continued to k together in the office. Within a week, another staff member tested positive. The office was not disinfected. Staff continued to work together. The week of December 1, the Vice President was in the office coughing continuously throughout common areas and he called people in to his office. He got tested for covid and continued to work in the office sick while waiting for his results. He tested positive. Then 2 more employees got covid. Offices and work stations were never disinfected. Joe said regular weekly housekeeping would continue. He said the office is safe and healthy with that.

Received 1/5/2021

NAIC 62111 Offices of Physicians

The physical therapy clinic/gym sees over 200 patients per day with twelve (12) employees. Coronavirus (COVID-19) is spreading among the employees and the employer had not performed any contract tracing, no safety precautions in place, and the employees are working in cramped in offices and are not six (6) feet apart.

Received 1/6/2021

NAIC 622110 general medical and surgical hospitals

DRAFT

Item #1: The employer does not provide appropriate personal protective equipment for employees in the primary care offices and isolation room who provide medical care to COVID-19 positive patients including, but not limited to, nebulizer treatments, swabbing, and oral temperature checks where the patient masks are removed. Only surgical masks are provided and employees are told that N95 masks are not needed. Also, disposable gowns have been reused by the doctors for months.

Received 1/6/2021

NAIC 713210 establishments primarily engaged in operating gambling facilities

The casino had approximately 800 guests at one time during the New Year's Eve "bash." The employer did not enforce the wearing of masks/facial coverings while a few of the guests were clearly displaying cold like symptoms. Security officials were not taking temperature checks of all the guests entering the facility. Employees were told that if they didn't come to work then they would no longer have a job at the casino. Employees are concerned for retaliation as it has been said that if these concerns were reported that there "would be hell to pay."

Received 1/7/2021

NAIC 722511 Full-Service Restaurants

Employer is allowing covid positive employees to work. Establishment was not sanitized. Customers can enter establishment without wearing masks. Staff in back of house also not wearing masks.

Received 1/7/2021

NAIC 331513 Steel Foundries

1. Employees are concerned more than one employee has tested positive for COVID-19, however, employer are not notifying employees who has been in close contact with the positive

DRAFT

worker. In addition, employer are encouraging employees to not inform the other employees if they test positive for COVID-19. 2. Employees who tested positive for COVID-19, are allowed to return to work while still having symptoms and within 3 days without following CDC guidelines. 3. The factory department is not being cleaned or sanitized to prevent employees from COVID-19.

Received 1/11/2021

NAIC 624230 Emergency and Other Relief Services

Several employees have been diagnosed with COVID-19 and have been allowed to return to work without quarantining for an appropriate period of time and other employees have become infected. Employees are being sent for rapid COVID tests and reporting to work before getting the results. Three employees have tested positive this week.

Received 1/11/2021

NAIC 813319 Other Social Advocacy Organizations

1. There have been several cases confirmed of COVID with no closures for cleaning or proper notification. Staff members in homes are not being notified they have been potentially exposed. Staff have to clean themselves and risk exposure instead of the company taking proper precautions and cleaning with their hired cleaning crew. 2. Masks are not worn properly, if worn at all. Potentially every staff member has been exposed to covid considering they are still holding meetings in an office building that has confirmed cases of covid and numerous exposures.

As demonstrated by this sample of recent complaints, OSHA continues to see concerns from employees on a regular basis about inadequate COVID-19 safety measures in their workplaces. This ETS addresses numerous issues raised in these complaints, including physical

DRAFT

distancing, face coverings, disinfection of surfaces and equipment, and measures to keep contagious co-workers away from the workplace.

Based on its thorough review of OSHA's existing approach to protecting employees from COVID-19 and the current state of the pandemic, OSHA finds that existing OSHA standards, the General Duty Clause, and non-mandatory guidance issued by OSHA are not adequate to protect employees from COVID-19. Similarly, the numerous guidance products published by other entities, such as CDC, are not sufficiently effective at protecting employees because such guidance is not enforceable and there is no penalty for noncompliance. OSHA has determined that each of these tools, as well any combination of them, is inadequate to address COVID-related hazards, thereby establishing the need for this ETS.

This inadequacy has also been reflected in the growing number of states and localities that have issued their own mandatory requirements in recognition that existing measures (including non-mandatory guidance, compliance assistance, and enforcement of existing standards) have failed to slow the spread of the virus. While these state and local requirements may have had positive effects where they have been implemented, they are no replacement for a national standard that would establish definitively that COVID-19 safety measures are no longer voluntary. Without a national standard, the patchwork of inconsistent requirements has proven both ineffective at a national level and burdensome to employers operating across jurisdictions. See ORCHSE, October 9, 2020. Congress has charged OSHA with protecting America's workforce, and an ETS is the only measure capable of providing that scope of protection from the hazards of COVID-19.

DRAFT

The Current Standards and Regulations Are Inadequate

In enforcement guidance issued in May 2020 (OSHA, May 19, 2020), OSHA identified a number of current standards and regulations that might apply when workers have occupational exposure to SARS-CoV-2. (Interim Enforcement Response Plan) (OSHA, May 19, 2020). In addition to the standards listed there, OSHA has also cited the Hazard communication standard (29 CFR § 1910.1200) during COVID-19 investigations. Accordingly, the complete list of potentially applicable standards and regulations follows:

- 29 CFR Part 1904, Recording and Reporting Occupational Injuries and Illnesses. This regulation requires certain employers to keep records of work-related fatalities, injuries, and illnesses and report them to the government in specific circumstances.
- 29 CFR 1910.132, General requirements — Personal Protective Equipment (PPE). This standard requires that appropriate PPE, including PPE for eyes, face, head, and extremities, protective clothing, respiratory devices, and protective shields and barriers, be provided, used, and maintained in a sanitary and reliable condition.
- 29 CFR 1910.133, Eye and face protection. This standard requires that employers ensure the use of appropriate eye and face protection.
- 29 CFR 1910.134, Respiratory protection. This standard requires that employers provide, and ensure the use of, appropriate respiratory protection when necessary to protect employee health.
- 29 CFR 1910.141, Sanitation. This standard applies to permanent places of employment and contains, among other requirements, general housekeeping and waste disposal requirements.

DRAFT

- 29 CFR 1910.145, Specification for accident prevention signs and tags. This standard requires the use of biological hazard signs and tags, in addition to other types of accident prevention signs and tags.
- 29 CFR 1910.1020, Access to employee exposure and medical records. This standard requires that employers provide employees and their designated representatives access to relevant exposure and medical records.
- 29 CFR 1910.1200, Hazard communication. This standard requires employers to keep Safety Data Sheets (SDS) for chemical hazards, provide SDSs to employees and their representatives when requested, and train employees about those hazards. The standard does not apply to biological hazards, but hazard communication becomes an issue for the SARS-CoV-2 virus when chemicals are used to disinfect surfaces. OSHA notes that, when such chemicals are used in the workplace, the employer is required to comply with the hazard communication standard. The agency has not incorporated hazard communication requirements in the ETS, but has included related training and notification requirements. Section 1910.1200 compliance is only peripherally related to protection against SARS-CoV-2 hazards, employers are generally aware of those requirements, and the requirements of § 1910.1200 are enforceable without being repeated in the ETS.

Through its enforcement efforts to date, OSHA has encountered significant obstacles revealing that existing standards and regulations are inadequate to address the COVID-19 hazard, and has determined that a COVID-19 ETS is necessary to address these inadequacies. As discussed in further detail below, OSHA has determined that some of the above-listed standards—including Eye and Face Protection at 1910.132 and Sanitation at 1910.141—are in

DRAFT

practice too difficult to apply to the COVID-19 hazard and have never been cited in COVID enforcement; other standards—such as Respiratory Protection at 1910.134 and general PPE at 1910.132—are more clearly applicable to the COVID-19 hazard, but offer little protection to the vast majority of employees outside of hospital settings involving direct exposure to COVID-19 patients. Those standards only require PPE or respiratory protection if they are needed to protect from a hazard, and current CDC guidance does not indicate that they are generally needed outside of direct patient care.[10]

Finally, the remaining listed standards and regulations—for recordkeeping and reporting, accident prevention signs and tags, access to employee records, and hazard communication—while applicable to the COVID-19 hazard and important in the overall scheme of workplace safety, do not require employers to implement specific measures to protect workers from COVID-19. Further, as addressed in more detail below, even applicable regulations like the reporting requirements did not contemplate a hazard like COVID-19, and have proven to be difficult to apply to it. Thus, for the reasons elaborated in further detail below, OSHA has determined that its existing standards and regulations are insufficient to adequately address the grave danger posed by COVID-19.

First, most of the safety measures known to reduce the hazard of COVID-19 transmission are not explicitly required by existing standards: none require measures such as face coverings, physical distancing, physical barriers, disinfection, improved ventilation to reduce virus

[10] The Interim Enforcement Response Plan also suggests that while OSHA's Bloodborne Pathogens standard (29 CFR § 1910.1030) does not typically apply to respiratory secretions that may contain SARS-CoV-2, the provisions of the standard offer a framework that may help control some sources of the virus, including exposures to body fluids (e.g., respiratory secretions) not covered by the standard. While this is true for some of the controls required by that standard, such as laundering and cleaning, it does not contain requirements to implement necessary controls to protect employees against airborne transmission of SARS-CoV-2, such as distancing, barriers, and ventilation. And in any event, it imposes no obligations unless blood or other potentially infectious materials (as defined in the standard) are present.

DRAFT

transmission, isolation of sick employees, or notification to employees potentially exposed to people with COVID-19. For example, OSHA's existing PPE standard requires employers to assess the workplace for hazards and provide employees with PPE that is of "safe design and construction" to adequately "protect *the affected employee*" from hazards (29 CFR 1910.132(c) and (d), respectively). While OSHA recognizes that face coverings have value as a method of source control to prevent COVID-19 transmission, given their variability in design and construction they do not qualify as PPE under OSHA's PPE standard, and OSHA did not have specific enforceable requirements related to them. With the ETS's new requirements that face coverings meet specific design and construction criteria, including fit specified separately in the ETS, face coverings will qualify as PPE for OSHA enforcement purposes, so workers will receive additional protection, and employers will have notice of what OSHA considers to be safe design and construction to help protect the wearer from COVID-19.

Similarly, while the Sanitation standard at § 1910.141(a)(3) requires places of employment "to be kept clean to the extent that the nature of the work allows," the standard does not require disinfection of potentially contaminated surfaces nor does it speak to the level or frequency with which cleaning is required to protect against an infectious disease hazard like COVID-19. Accordingly, OSHA has not yet identified any instance in which the Sanitation standard could be applied in the agency's COVID-19 enforcement efforts. Thus, OSHA's efforts to enforce existing standards to address the COVID-19 hazard have been significantly hindered by the absence of any specific requirements in these standards related to the most important COVID-19-mitigation measures. The COVID-19 ETS addresses this issue by clearly mandating each of these necessary protections.

DRAFT

Second, because existing standards do not contain provisions specifically targeted at the COVID-19 hazard, it may be difficult for employers and employees to determine what particular COVID-19 safety measures are required by existing standards, or how the separate standards are expected to work together as applied to COVID-19. As explained in more detail in the *Need for Specific Provisions* (Section V of the preamble), the infection control practices required to address COVID-19 are most effective when used together, layering their protective impact. Because no such layered framework currently exists, the existing standards leave large gaps in employee protection from COVID-19. An ETS with provisions specifically addressing COVID-19 hazards will provide clearer instructions to the average employer than the piecemeal application of existing standards. The ETS "bundles" all of the relevant requirements, providing a roadmap for employers and employees to use when developing a plan and implementing protections, so that employers and employees know what is required to protect employees from COVID-19. More certainty will lead to more compliance, and more compliance will lead to improved protection of employees.

Third, even where existing OSHA regulations and standards may provide some protections appropriate to COVID-19 hazards, they still lack the specificity needed to effectively manage the workplace health impacts of the pandemic on a widespread basis. For example, the Respiratory Protection standard requires the provision of a respirator to employees when it is "necessary to protect the health of such employee." 29 CFR 1910.134(a)(2). Similarly, the general PPE standard requires the provision of PPE in part, "whenever it is necessary by reason of hazards of processes or environment." 29 CFR 1910.132(a). The language in these provisions does not provide sufficient guidance to help employers and employees determine when respirators or other PPE are necessary to protect against COVID-19 hazards. Given this

DRAFT

lack of clarity, OSHA has found that these standards are only readily applicable to enforcement in healthcare settings where direct treatment of patients with COVID-19 where the CDC guidance recommends respirators and other PPE; elsewhere, where it is not clear that a person nearby is infected with COVID-19, the CDC and other public health authorities have generally not recommended respirators or other PPE. Accordingly OSHA has not enforced these standards in these situations, and without such public health guidance it would be difficult for OSHA to do so.. Moreover, the Respiratory Protection standard does not address the implementation of conventional, contingency, and crisis capacity strategies (i.e., CDC-approved strategies to employ in addressing respirator supply shortages, including the use of potentially less protective respirators, such as expired, foreign certified, or disinfected filtering facepiece respirators) made necessary due to respirator shortages experienced as a result of this unprecedented pandemic.

Requirements in some existing standards may be appropriate for other situations but simply do not contemplate COVID-19 hazards. For example, as noted above, the Sanitation standard at § 1910.141 requires employers to provide warm water, soap, and towels that can be used for hand washing, an important protective action against COVID-19, and generally requires that places of employment be kept "clean," but it does not specify *disinfection* as a cleaning procedure, even though disinfection is a necessary precaution against COVID-19 transmission. The ETS, developed in direct response to the COVID-19 hazard and associated pandemic, provides this needed specificity so employers understand exactly what is required during this unprecedented public health emergency.

Fourth, the existing recordkeeping and reporting regulations are not adequate to help the employer or the agency assess the full scope of COVID-19 workplace exposures. The recordkeeping regulations were not written with the nature of COVID-19 transmission or illness

DRAFT

in mind. In order to adequately understand and thereby control the spread of COVID-19 in the workforce, it is critical that the employer has a record of all cases of COVID-19 occurring among employees; however, such information is outside of the scope of OSHA's existing recordkeeping requirements, which are limited to injuries or illnesses that the employer knows to be work-related. The existing regulations are premised on the assumption that employers can easily identify injuries or illnesses that are work-related, but COVID-19 transmission can occur in the workplace, the community, or the household, and it can be difficult to identify the point of transmission. In numerous investigations OSHA has identified employee illnesses or deaths from COVID-19 that were not reflected in the employer's required recordkeeping logs because the employer was not able to determine whether the illness or death was work-related. The COVID-19 log required by the ETS will provide a fuller picture of the prevalence of SARS-CoV-19 in the workplace by requiring employers to record employee cases without a work-relatedness determination.

Furthermore, even where work-relatedness can be determined, the existing reporting regulations are also inadequate in ensuring OSHA has the full picture of the impact of COVID-19 because the regulations only require employers to report in-patient hospitalizations that occur within 24 hours of the work-related incident and to report fatalities that occur within thirty days of the work-related incident. But many COVID-19 infections will not result in hospitalization or death until well after these limited reporting periods; consequently they are not required to be reported to OSHA, which limits the agency's ability to fully understand the impact of COVID-19 on the workforce. In order to adequately understand and thereby control the spread of COVID-19 in the workforce, it is critical that the employer has a record of all cases of COVID-19 occurring

DRAFT

among employees and that OSHA is timely informed of all work-related COVID-19 in-patient hospitalizations and fatalities.

OSHA's existing recordkeeping and reporting requirements are also inadequate for addressing the COVID-19 hazard because the current reporting structure does not require employers to notify employees of possible exposures in the workplace. While the recordkeeping requirements require employers to make illness and injury records available to employees, 29 C.F.R. 1910.35(b)(2), they do not create an affirmative duty requiring employers to notify employees when they may have been exposed to another employee with the disease. Given the transmissibility of COVID-19, timely notification of an exposure is critical to curbing further spread of COVID-19 and protecting employees from the COVID-19 hazard.

Thus, OSHA's existing recordkeeping and reporting requirements are not tailored to address hazards associated with COVID-19. As a result, they do not enable OSHA, employers, or employees to accurately identify and address such hazards. The ETS addresses that issue by requiring employers to record each instance identified by the employer in which an employee is COVID-19 positive, regardless of whether the instance is connected to exposure to COVID-19 at work; requiring employers to report work-related, COVID-19 in-patient hospitalizations and fatalities, regardless of when the exposure in the work environment occurred; and imposing an affirmative duty requiring employers to notify employees of COVID-19 exposure.

In conclusion, OSHA's experience has demonstrated that existing standards alone are inadequate to address the COVID-19 hazard. The limitations and inadequacies explained above prevent OSHA from citing employers under these existing standards even in situations that are clearly hazardous to employees. For example, nothing in these existing standards would prevent a grocery store employer from allowing an employee with a fever, cough, and loss of taste and

DRAFT

smell to come to the workplace and work alongside fellow employees throughout the day without wearing a mask and while sharing equipment. The employee could then subsequently inform the employer of a positive test for COVID-19 and, under existing standards, the employer would be under no obligation to exclude the employee from the workplace, disinfect the employee's workspace or tools, or to inform other workers who were exposed to the infected employee. Thus, OSHA finds that its existing standards are not sufficient to protect employees from the grave danger posed by COVID-19.

The General Duty Clause Is Inadequate to Meet the Current Crisis

Section 5(a)(1) of the OSH Act, or the General Duty Clause, provides the general mandate that each employer "furnish to each of his employees employment and a place of employment which are free from recognized hazards that are causing or are likely to cause death or serious physical harm to his employees." 29 U.S.C. 654(a)(1). While OSHA attempted, during the first year of the pandemic, to use the General Duty Clause to protect employees from COVID-19-related hazards, OSHA found that there are significant challenges associated with this approach; the agency now finds that a specific standard is necessary and, for reasons discussed elsewhere, is promulgating this ETS under Section 6(c) of the OSH Act. While the General Duty Clause can be used in many contexts, in OSHA's experience over the past year, the clause falls short of the agency's mandate to protect employees from the hazards of COVID-19. As explained more fully below, OSHA finds the ETS will more efficiently and effectively address those hazards. *Cf.*, Bloodborne Pathogens, 56 Fed. Reg. 64004, 64007, 64038 (Dec. 6, 1991) (bloodborne pathogens standard will more efficiently reduce the risk of the hazard than can enforcement under the general duty clause).

DRAFT

As an initial matter, the General Duty Clause does not provide employers with specific requirements to follow or a roadmap for implementing appropriate abatement measures. The ETS, however, provides a clear statement of what OSHA expects employers to do to protect workers, thus facilitating better compliance. The General Duty Clause is so named because it imposes a *general* duty to keep the workplace free of recognized serious hazards; the ETS, in contrast, lays out clear requirements for COVID-19 plans, distancing, barriers, cleaning, personal protective equipment, and training, among other things. Conveying obligations as clearly and specifically as possible provides employers with enhanced notice of how to comply with their OSH Act obligations to protect workers from COVID-19 hazards. *See, e.g., Integra Health Mgmt., Inc.*, 2019 WL 1142920, at *7 n.10 (OSHRC No. 13-1124, 2019) (noting that standards "give clear notice of what is required of the regulated community"); 56 Fed. Reg. 64007 ("because the standard is much more specific than the current requirements [general standards and the general duty clause], employers and employees are given more guidance in carrying out the goal of reducing the risks of occupational exposure to bloodborne pathogens").

Moreover, several characteristics of General Duty Clause enforcement actions limit on how effectively OSHA can use the clause to address hazards associated with COVID-19. Most important, the General Duty Clause is not a good tool for requiring employers to adopt specific, overlapping, and complementary abatement measures, like those required by the ETS, and some important worker-protective elements of the ETS (such as payment for medical removal) would be virtually impossible for OSHA to require and enforce under the General Duty Clause. Second, OSHA's burden of proof for establishing a General Duty Clause violation is heavier than for standards violations. Third, the ETS will enable OSHA to issue more meaningful penalties for willful or egregious violations, thus facilitating better enforcement and more effective deterrence

DRAFT

against employers who intentionally disregard their obligations under the Act or demonstrate plain indifference to employee safety. Fourth, the General Duty Clause does not provide complete protection to employees at multi-employer worksites, where more than one employer controls hazards at the workplace. The ETS will permit more thorough enforcement in these situations. Each of these is discussed in more detail below.

*General Duty Clause citations impose a heavy litigation burden on OSHA*. For contested General Duty Clause citations to be upheld, OSHA must demonstrate elements of proof that are supplementary to, and can be more difficult to show than, the elements of proof required for violations of specific standards, where a hazard is presumed. Specifically, to prove a violation of the General Duty Clause, OSHA needs to establish – in each individual case – that: (1) an activity or condition in the employer's workplace presented a hazard to an employee; (2) the hazard was recognized; (3) the hazard was causing or was likely to cause death or serious physical harm; and (4) feasible means to eliminate or materially reduce the hazard existed. *BHC Nw. Psychiatric Hosp., LLC v. Sec'y of Labor*, 951 F.3d 558, 563 (D.C. Cir. 2020).

For the first element of a General Duty Clause case, OSHA must prove that there is a hazard, i.e., a workplace condition or practice to which employees are exposed, creating the potential for death or serious physical harm to employees. *See SeaWorld of Florida LLC v. Perez*, 748 F.3d 1202, 1207 (D.C. Cir. 2014); *Integra Health Management*, 2019 WL 1142920, at *5. In the case of COVID-19, this means showing not just that the virus is a hazard as a general matter – a fairly indisputable point – but also that the specific conditions in the cited workplace, such as workers standing close to each other for extended periods, create a hazard. In contrast, an OSHA standard that requires or prohibits specific conditions or practices *establishes* the existence of a hazard. *See Harry C. Crooker & Sons, Inc. v. Occupational Safety & Health*

DRAFT

*Rev. Comm'n*, 537 F.3d 79, 85 (1st Cir. 2008); *Bunge Corp. v. Sec'y of Labor*, 638 F.2d 831, 834 (5th Cir. 1981). Thus, in enforcement proceedings under OSHA standards, as opposed to the General Duty Clause, "the Secretary need not prove that the violative conditions are actually hazardous." *Modern Drop Forge Co. v. Sec'y of Labor,* 683 F.2d 1105, 1114 (7th Cir. 1982). With OSHA's finding that the hazard of exposure to COVID-19 can exist in all covered workplaces (see *Grave Danger*, above), the ETS will eliminate the burden to repeatedly prove the existence of a COVID-19 hazard under the General Duty Clause.

One of the most significant advantages to standards like the ETS that establish the existence of the hazard at the rulemaking stage is that the Secretary can require specific abatement measures without having to prove that the cited workplace is already hazardous.[11] In contrast, under the General Duty Clause, the Secretary cannot require abatement before proving in the enforcement proceeding that an existing condition at the workplace is hazardous. For example, in a facial challenge to OSHA's Grain Handling Standard, which was promulgated in part to protect employees from the risk of fire and explosion from accumulations of grain dust, the Fifth Circuit acknowledged OSHA's inability to effectively protect employees from these hazards under the General Duty Clause in upholding, in large part, the standard. *See Nat'l Grain & Feed Ass'n v. Occupational Safety & Health Admin.*, 866 F.2d 717, 721 (5th Cir. 1988) (noting Secretary's difficulty in proving explosion hazards of grain handling under General Duty Clause). Although OSHA had attempted to address fire and explosion hazards in the grain handling industry under the General Duty Clause, "employers generally were successful in

[11] "The Act does not wait for an employee to die or become injured. It authorizes the promulgation of health and safety standards and the issuance of citations in the hope that these will act to prevent deaths and injuries from ever occurring." *Whirlpool Corp, v. Marshall*, 445 U.S. 1, 12 (1980); *see also Arkansas-Best Freight Sys., Inc. v. Occupational Safety & Health Rev. Comm'n*, 529 F.2d 649, 653 (8th Cir. 1976) (noting that the "[OSH] Act is intended to prevent the first injury").

DRAFT

arguing that OSHA had not proved that the specific condition cited could cause a fire or explosion." *Id.* at 721 & n.6 (citing cases holding that OSHA failed to establish a fire or explosion hazard under the General Duty Clause). In other words, the General Duty Clause was not an effective tool because OSHA could not prove that existing conditions at the cited workplace were already hazardous. The Grain Handling Standard, in contrast, established specific limits on accumulations of grain dust based on its combustible and explosive nature, and the standard allowed OSHA to cite employers for exceeding those limits without the need to prove at the enforcement stage that each cited accumulation was likely to cause a fire or explosion. *See id.* at 725-26. The same logic applies to COVID-19 hazards. Given OSHA's burden under the General Duty Clause to prove that conditions at the cited workplace are already hazardous, it is difficult for OSHA to ensure necessary abatement before employee lives and health are unnecessarily endangered by exposure to COVID-19. The ETS, on the other hand, allows OSHA to cite employers for each protective requirement they fail to implement without the need to prove in an enforcement proceeding that the particular cited workplace was hazardous without that particular measure in place.

An additional limitation of the General Duty Clause is that it requires OSHA to show that there was a feasible and effective means of abating the hazard. To satisfy this element, OSHA is required to prove that there are existing abatement measures that will be effective in *materially* reducing the hazard. *See Integra Health Management*, 2019 WL 1142920, at *12. Proving the existence of feasible abatement measures that will be effective in materially reducing the hazard usually requires testimony from an expert witness, which limits OSHA's ability to prosecute these cases as broadly as needed to protect more workers. *See, e.g.*, *id.* at *13 (requiring expert witness to prove proposed abatement measures would materially reduce hazard). In contrast,

DRAFT

where an OSHA standard specifies the means of compliance, the agency has already made the necessary technical determinations in the rulemaking and therefore does not need to establish feasibility of compliance as part of its *prima facie* case in an enforcement proceeding; instead, the employer bears the burden of proving infeasibility as an affirmative defense. *See, e.g.*, *A.J. McNulty & Co. v. Sec'y of Labor*, 283 F.3d 328, 334 (D.C. Cir. 2002); *S. Colorado Prestress Co. v. Occupational Safety & Health Rev. Comm'n*, 586 F.2d 1342, 1351 (10th Cir. 1978). Protecting as many workers as quickly as possible is especially critical in the context of COVID-19 because, as explained in Section IV.A, *Grave Danger*, it can spread so easily in workplaces.

*The General Duty Clause is ill-suited to requiring employers to adopt a comprehensive set of complementary abatement measures, like those required by the ETS*. As explained in Section V. Need for the Specific Provisions of the ETS, effective infection control programs use a suite of overlapping controls in a layered approach to ensure that no inherent weakness in any one approach results in an infection incident. Each of the practices required by the ETS provides some protection from COVID-19 on its own, but the practices must be used together to ensure adequate worker protection. However, General Duty Clause enforcement poses key obstacles that prevent OSHA from requiring the types of overlapping controls necessary to address COVID-19 hazards. Because the General Duty Clause requires OSHA to establish the existence and feasibility of abatement measures that can *materially reduce* a hazard, it can be difficult for OSHA to use 5(a)(1) to require a full suite of overlapping or complementary control measures, or, in other words, to require additional abatement measures in situations where an employer is doing *something,* but not everything the ETS will require, to address COVID-19 hazards.

In many cases over the past year where OSHA investigated COVID-19-related complaints, the agency discovered that employers were following some minimal mitigation

DRAFT

strategy while ignoring other crucial components of employee protection. In such instances, because the employer had taken *some* steps to protect workers, successfully proving a General Duty Clause citation would have required OSHA to show that additional missing measures would have further *materially* reduced the COVID-19 hazard. Although OSHA believes each measure required by this ETS materially reduces the COVID-19 hazard, there are key challenges inherent in trying to make such a showing in an individual case, such as the difficulty of pinpointing exactly when and how employees could become infected with COVID-19 and establishing the magnitude of the effect particular abatement measures would have on reducing infection in the specific conditions present in the employer's workplace. *See*, *e.g.*, *Pepperidge Farm, Inc.*, 17 OSH Cas. (BNA) 1993, 1997 WL 212599, at *51 (OSHRC No. 89-265, Apr. 26, 1997) (finding that additional feasible abatement measure established by the Secretary to address ergonomic hazard did not materially reduce the hazard in light of the other steps the employer had taken). The ETS cures this problem by imposing separate requirements for each necessary mitigation measure, thereby ensuring employers have an enforceable obligation to provide the full suite of workplace protections recommended by the CDC and other expert bodies.

Consider an employer with fifty employees working in rows on a factory floor. The employer requires the use of face coverings, but has not installed barriers between employee work stations or implemented any policies for physical distancing. Under the ETS, OSHA can cite the employer for violating the specific requirement to ensure employees are separated from other people by at least 6 feet or the requirement to provide physical barriers at each fixed work location where employees are not separated from one another by at least 6 feet. The standard itself would dictate the remedial measures the employer must take: ensure that employees keep

DRAFT

required distance from others in accordance with the terms of the standard or provide barriers between work stations.

Without the ETS, however, OSHA would have to cite the employer under the General Duty Clause for the much broader violation of failing to eliminate the recognized workplace hazard of COVID-19 infection. This would require OSHA to prove: (1) that the hazard of COVID-19 infection was present and recognized at this particular workplace and (2) that additional abatement methods, such as requiring physical distancing and barriers, would materially reduce the hazard, over and above the reduction achieved by use of face coverings. Both of these elements would likely require expert witness testimony specific to conditions on this particular factory floor, and it may be difficult to establish that suitable physical distancing policies and/or barriers would have *materially* reduced the hazard depending on the facts of the specific instance. In fact, absent evidence that there was a COVID-19-positive person in the workplace – which could implicate privacy issues and be hard to establish even if there were such a person – it would be burdensome for OSHA to prove there was a hazard in the first instance at this particular workplace. And without such evidence, OSHA would be left unable to require any additional abatement measures at the factory, leaving workers at greater risk of infection.

Further, even where OSHA establishes a violation of the General Duty Clause, the employer is under no obligation to implement the feasible means of abatement proven by OSHA as part of its prima facie case. *Cyrus Mines Corp.*, 11 OSH Cas. (BNA) 1063, 1982 WL 22717, at *4 (OSHRC No. 76-616, Dec. 17, 1983). Thus, even in cases where OSHA prevails, the employer need not necessarily implement the specific abatement measure(s) OSHA established would materially reduce the hazard. The employer could select alternative controls and then it

DRAFT

would be up to OSHA, if it wished to cite the employer again, to establish that the recognized hazard continued to exist and that adding physical distancing policies, for example, could materially reduce the hazard even further.

Finally, there are some crucial requirements in the ETS that OSHA is unlikely to be able to enforce at all under the General Duty Clause. Of particular note, OSHA is adopting provisions in the ETS that require removal of COVID-19-positive employees and other workers exposed to them from the workplace and payment of salary for employees who cannot be reassigned work that they can perform in isolation (medical removal provisions, or "MRP"). These provisions are critical to protecting workers because they eliminate situations where employees hesitate to disclose their COVID-19 status for fear of lost pay, ensuring removal of infected employees and their close contacts as soon as the employer knows they have COVID-19. Additional discussion of the importance of these provisions can be found in Section V. *Need for the Specific Provisions of the ETS*. While it might be possible for OSHA to establish the need to remove known infected employees in a General Duty Clause case, it is highly unlikely that OSHA could require payment to those employees, or other measures to encourage them to let employers know of their positive tests. Rather, MRP is a measure better implemented through OSHA's statutory authority to promulgate standards. Standards are forward-looking and can be used to create a comprehensive network of required, and in this case of layered, worker safety protections. The ETS creates just such a network and MRP is an important layer of that approach.

*The ETS will permit OSHA to achieve meaningful deterrence when necessary to address willful or egregious failures to protect employees against the COVID-19 hazard*. As described above, in contrast to the broad language of the General Duty Clause, the ETS will clarify what

DRAFT

exactly employers are required to do to protect employees from COVID-19-related hazards, making it easier for OSHA to determine whether an employer has intentionally disregarded its obligations or exhibited a plain indifference to employee safety or health. In such instances, OSHA can classify the citations as "willful," allowing it to propose higher penalties, with increased deterrent effects. Early in the pandemic, shifting guidance on the safety measures employers should take to protect their employees from COVID-19 created ambiguity regarding employers' specific obligations. Thus, OSHA could not readily determine whether a particular employer had "intentionally" disregarded obligations that were not yet clear. And, even as the guidance began to stabilize, OSHA's ability to determine "intentional disregard" or "plain indifference" was difficult, for example, when an employer took some, but not all, of the necessary steps to sufficiently address the COVID-19 hazard. Given the current understanding that multiple layers of protection are necessary to adequately protect workers from COVID-19, a hazard-specific ETS will ensure that employers have clearer notice of their obligations. This will allow the agency to take appropriate steps to redress the situation where an employer has intentionally disregarded the requirements necessary to protect employees from COVID-19 hazards, or has acted with plain indifference to employee safety.

Further, OSHA has adopted its "egregious" policy to impose sufficiently large penalties to achieve appropriate deterrence against bad actor employers who willfully disregard their obligation to protect their employees when certain aggravating circumstances are present, such as a large number of injuries or illnesses, bad faith, or an extensive history of noncompliance. (OSHA Directive CPL 02-00-080 (October 21, 1990.)) Its purpose is to increase the impact of OSHA's enforcement ability. This policy utilizes OSHA's authority to issue a separate penalty for each instance of willful noncompliance with an OSHA standard, such as each employee

DRAFT

lacking the same required protections, or each work station lacking the same required controls. It can be more difficult to use this policy under the General Duty Clause because the Fifth Circuit and the Commission have held that, under the General Duty Clause, OSHA may only cite a hazardous condition once, regardless of its scope. *Reich v. Arcadian Corp.*, 110 F.3d 1192, 1199 (5th Cir. 1997). Thus, even where OSHA finds that an employer willfully failed to protect a large number of employees from a COVID-19 hazard, OSHA likely could not cite the employer on a per-instance basis for failing to protect each of its employees. A COVID-19-specific ETS will clarify the permissible units of prosecution and thereby make clear OSHA's authority to separately cite employers for each instance of the employer's failure to protect employees and for each affected employee, where appropriate.

By providing needed clarity, the ETS will facilitate "willful" and "egregious" determinations that are critical enforcement tools OSHA can use to adequately address violations by employers who have shown a conscious disregard for the health and safety of their workers in response to the pandemic. Without the necessary clarity, OSHA has been limited in its ability to impose penalties high enough to motivate the very large employers who are unlikely to be deterred by penalty assessments of tens of thousands of dollars, but whose noncompliance can endanger thousands of workers. For example, one of the General Duty Clause citations OSHA issued in 2020 was to a large, international employer running a meatpacking plant that failed to take sufficient measures to mitigate the spread of COVID-19 among workers (OSHA, September 10, 2020; Bunge, September 10, 2020; Lussenhop, April 17, 2020; Pfankuck, October 2, 2020). At the time OSHA investigated conditions at the plant, more than 1,294 employees had tested positive for COVID-19—which was 35% of the entire workforce—with at least 48 of those employees hospitalized, and 4 of them dead as a result of the disease. Despite these extreme

DRAFT

circumstances, OSHA ultimately determined it could only issue one General Duty Clause citation with a "serious" classification, for a total proposed penalty of $13,494, the maximum penalty allowed by law for "serious" violations. 29 U.S.C. 666(b).

Two of OSHA's other COVID-19 General Duty Clause citations to date have also been issued to meatpacking employers with similarly egregious statistics—in one facility at least 290 employees had tested positive for COVID-19 and 6 had died (Fendt, September 30, 2020; The Associated Press, October 8, 2020; Bradbury, July 12, 2020), and in another 357 employees had tested positive and 2 had died (BeMiller, October 23, 2020)—and again, OSHA determined it could only issue one "serious" General Duty Clause citation to each employer, with total proposed penalties of $15,615 and $13,494, respectively (OSHA, January 14, 2021). These penalties are only two or three thousand dollars higher than the proposed penalties issued to some employers who were cited only for recordkeeping violations related to COVID-19. Thus, it has become apparent to OSHA through its enforcement efforts to date that even when it believes it can meet the heavy burden of proof required for a General Duty Clause citation, with respect to COVID-19-related citations, it has been unable to impose the penalties necessary to appropriately address the most egregious offenders or sufficiently incentivize employers, especially large ones, to implement necessary employee protections.

DRAFT

*The General Duty Clause provides incomplete protection at multi-employer worksites*. Finally, the General Duty Clause has limited application to multi-employer worksites, as it cannot be used to cite an employer whose own employees were not exposed to a hazard even if that employer may have created, contributed to, or controlled the hazard. *See Solis v. Summit Contractors, Inc.*, 558 F.3d 815, 818 (8th Cir. 2009) ("Subsection (a)(1) [the General Duty Clause] creates a general duty running only to an employer's own employees, while subsection

(a)(2) creates a specific duty to comply with standards for the good of all employees on a multi-employer worksite."). For example, if a subcontractor were to send one employee who is COVID-19 positive to a multi-employer worksite and knowingly allow that employee to work around employees of other contractors without a face covering, exposing those other employees to COVID-19, the subcontractor who created the hazard could not be issued a General Duty Clause citation because none of the subcontractor's own employees would have been exposed to the hazard. This limitation of the General Duty Clause can prevent OSHA from citing the employer on a multi-employer worksite who may be the most responsible for an existing COVID-19 hazard or best positioned to mitigate that hazard.

For all of the reasons described above, and after a year of attempting to use the General Duty Clause to address this widespread hazard, OSHA finds that the General Duty Clause is not an adequate enforcement tool to protect employees from the grave danger posed by COVID-19.

OSHA and Other Entity Guidance Is Insufficient

OSHA has issued numerous non-mandatory guidance products to advise employers on how to protect workers from SARS-CoV-2 infection. (See https://www.osha.gov/coronavirus.) Even the most comprehensive guidance makes clear, as it must, that the guidance itself imposes no new legal obligations, and that its recommendations are "advisory in nature." (See OSHA's online guidance, Protecting Workers: Guidance on Mitigating and Preventing the Spread of COVID-19 in the Workplace (January 29, 2021); and OSHA's earlier 35-page booklet, Guidance on Preparing Workplaces for Covid-19 (March 9, 2020)). This guidance, as well as guidance products issued by other government agencies and organizations, including the CDC, the Centers for Medicare and Medicaid Services (CMS), the Institute of Medicine (IOM), and the World Health Organization (WHO), help protect employees to the extent that employers voluntarily

DRAFT

choose to implement the practices they recommend. Unfortunately, OSHA's experience shows that does not happen consistently or rigorously, resulting in inadequate protection for employees.

As documented in numerous peer-reviewed scientific publications, CDC, IOM, and WHO have recognized a lack of compliance with non-mandatory recommended infection-control practices (Siegel et al., 2007; IOM, 2009; WHO, 2009). OSHA was aware of these findings when it previously concluded that an ETS was not necessary, but at the time of that conclusion, the agency erroneously believed that it would be able to effectively use the non-mandatory guidance as a basis for establishing the mandatory requirements of the General Duty Clause, and informing employers of their compliance obligations under existing standards. As explained above, that has not proven to be an effective strategy. Moreover, when OSHA made its initial necessity determination at the beginning of the pandemic, it made an assumption that given the unprecedented nature of the COVID-19 pandemic, there would be an unusual level of widespread voluntary compliance by the regulated community with COVID-19-related safety guidelines (see, e.g., DOL, May 29, 2020 at 20 (observing that "[n]ever in the last century have the American people been as mindful, wary, and cautious about a health risk as they are now with respect to COVID-19," and that many "protective measures are being implemented voluntarily, as reflected in a plethora of industry guidelines, company-specific plans, and other sources")).

Since that time, however, developments have led OSHA to conclude that the same uneven compliance documented by CDC, IOM, and WHO is also occurring for the COVID-19 guidance issued by OSHA and other agencies. For example, there has been a reported rise of "COVID fatigue" or "pandemic fatigue"—i.e., a decrease in voluntary use of COVID-19 mitigation measures over time (Silva and Martin, November 14, 2020; Meichtry et al., October

DRAFT

26, 2020; Belanger and Leander, December 9, 2020). Other reasons that people have not followed COVID-19 guidance include fear of financial loss; skepticism about the danger posed by COVID-19; and even a simple human tendency, called "psychological reactance," to resist curbs on personal freedoms, i.e., an urge to do the opposite of what somebody tells you to do (Belanger and Leander, December 9, 2020; Markman, April 20, 2020). OSHA is seeing evidence of these trends in its COVID-19 enforcement. For example, although OSHA has issued guidance since the spring of 2020 encouraging the use of physical distancing and barriers as a means of protecting employees at fixed work locations, there have been a number of news reports indicating that employers continue to ignore that guidance (Romo, November 19, 2020; Richards, May 5, 2020; Lynch, July 9, 2020). As evidenced by a number of the HALs noted earlier, even after the guidance was issued OSHA continued to encounter employee exposures that could have been reduced by barriers. Additionally, the high number of COVID-19-related complaints and reports that OSHA continues to receive on a regular basis suggests a lack of widespread compliance with existing voluntary guidance: from March 2020 to February 2021, OSHA has continued to receive several hundred COVID-19-related complaints every month, including over a thousand complaints each in the months of November and December of 2020 (OSHA, February 22, 2021). The number of COVID-19-related complaints peaked in April 2020, at 1,983, slowly decreased during the summer to a low of 609 complaints in September 2020, and then increased again to another peak in November of 1,169 complaints. If guidance were followed more strictly, or if there were enough voluntary compliance with steps to prevent illness, OSHA would expect to see a significant reduction in reports of deaths and hospitalizations, workplace outbreaks, and COVID-19-related complaints from employees.

DRAFT

The dramatic increases in the percentage of the population that contracted the virus toward the end of 2020 and in early 2021 indicates a continued risk of COVID-19 spread in workplace settings (for more information on the prevalence of COVID-19 see *Grave Danger* (Section IV of the preamble)) despite OSHA's publication of numerous specific and comprehensive guidance documents. OSHA has found that neither reliance on voluntary action by employers nor OSHA non-mandatory guidance is an adequate substitute for *specific, mandatory* workplace standards at the federal level. *Public Citizen v. Auchter*, 702 F.2d 1150 at 1153 (voluntary action by employers "alerted and responsive" to new health data is not an adequate substitute for government action).

Further, to the extent employers respond to increasing vaccination rates by reopening their businesses in expectation of increased demand, the ETS will provide clear requirements for them to follow to ensure their workers are protected. If those employers had not been operating, they may not be familiar with the required protective measures they must implement, which the standard will provide.

The ETS is one aspect of the coordinated national response to the pandemic that is needed to improve compliance with infection control measures by establishing clear, enforceable measures that put employers on notice that they must, rather than should, take action to protect their employees. For these reasons, OSHA finds that non-mandatory guidance efforts are not sufficient, by themselves or in conjunction with General Duty Clause enforcement, to protect employees from being infected by, and suffering death or serious health consequences from COVID-19.

A Uniform Nationwide Response to the Pandemic is Necessary to Protect Workers

DRAFT

OSHA is charged by Congress with protecting the health and safety of American workers. Yet OSHA's approach in 2020 proved ineffective in meeting that charge and many states and localities stepped in to fill the gaps in employee protection. But as states and localities have taken increasingly more divergent approaches to COVID-19 workplace regulation—ranging from states with their own COVID-19 ETSs to states with no workplace requirements at all—OSHA has determined that a Federal standard is needed to ensure sufficient protection for employees in all states; clarity and consistency about the obligations employers have to protect their employees; and to ensure a level playing field among employers.

As the pandemic has continued in the United States, there has been increasing recognition of the need for a more consistent national approach (GAO, September 2020; Budryk, November 17, 2020; Horsley, May 1, 2020). One of the justifications for OSHA standards has always been to "level the playing field" so that employers who proactively protect their workforces are not placed at a competitive disadvantage (*Am. Textile Mfrs. Inst. v. Donovan*, 452 U.S. 490, 521 n.38 (1981)). Many employers have advised OSHA that they would welcome a nationwide ETS for that reason. For example, in its October 9, 2020 petition for a COVID-19 ETS, ORCHSE Strategies, LLC explained that it is "imperative" that OSHA issue an ETS to provide employers one standardized set of requirements to address safety and health for their workers (ORCHSE, October 9, 2020). This group of prominent business representatives explained that an ETS would eliminate confusion and unnecessary burden on workplaces that are struggling to understand how best to protect their employees in the face of confusing and differing requirements across states and localities. While noting that "OSHA could not pre-empt a State from keeping its own rule (assuming it is 'at least as effective' as OSHA's standard)," they also observed that "historically, the impact of federal rulemaking in similar situations (e.g., HazCom)

DRAFT

has been that most, if not all, of the States ultimately adhere to the federal requirements …. That can only be accomplished if OSHA takes the lead" (id.). "Without an ETS," they continue, "employers are left on their own to determine the preventive measures that need to be undertaken" (id.).

Given that thousands of employees each week continue to be infected with COVID-19, many of whom will become hospitalized or die, OSHA recognizes that a patchwork approach to worker safety has not been successful in mitigating this infectious disease outbreak, and that an ETS is necessary to provide clear and consistent protection to employees across the country.

OSHA's Other Previous Rationales for Not Promulgating an ETS No Longer Apply

In addition to asserting that existing standards, guidance, and the General Duty Clause would provide sufficient tools to address COVID-19 hazards to employees, OSHA had previously cited the need to respond to evolving scientific knowledge about the virus as part of its rationale for not issuing an ETS during the late spring of 2020. Knowledge of the nature of COVID-19 was undoubtedly less certain at the beginning of the pandemic when OSHA made its initial determination that an ETS was not necessary. Although the scientific community's understanding of the virus continues to develop, since the summer of 2020 the guidance from the CDC and other health organizations has remained generally consistent regarding the basic precautions that are essential to protect people from exposure to COVID-19. For example, the CDC's COVID-19 guidance on How to Protect Yourself & Others (CDC, February 4, 2021) includes the same guidance it issued in July 2020 regarding the basic protections of face coverings, distancing, barriers, hand hygiene, and general cleaning. A "federal floor" based on this consensus is now appropriate while scientific study continues to increase understanding of more complex aspects of COVID-19 hazards, such as airborne transmission. OSHA's previous

DRAFT

concern—that an ETS would unintentionally enshrine requirements that are subsequently proven ineffective in reducing transmission—is simply no longer valid at this stage. Moreover, that concern is mitigated to some extent by OSHA's authority to modify the ETS if needed, or to terminate it entirely if vaccination and other efforts end the current emergency.

Nothing in the D.C. Circuit's decision in *In re Am. Fed'n of Labor & Cong. of Indus. Orgs.*, No. 20-1158, 2020 WL 3125324 (D.C. Cir. June 11, 2020); *rehearing en banc denied* (July 28, 2020) precludes OSHA's decision to promulgate an ETS now. To the contrary, at a time when the number of COVID-19 cases was much lower and the rate of new cases was declining in many areas, the court decided not to second guess OSHA's decision to hold off on regulation in order to see if its nonregulatory enforcement tools could be used to provide adequate protection against the virus. "OSHA's decision not to issue an ETS is entitled to considerable deference," the court explained, noting the "the unprecedented nature of the COVID-19 pandemic" and concluding merely that "OSHA reasonably determined that an ETS is not necessary *at this time*." (*Id*., with emphasis added).

Finally, it is worth noting that OSHA's conclusion as to the ineffectiveness of the current approach—i.e., relying on existing enforcement tools and voluntary guidance—is supported by a report issued by the DOL Office of Inspector General, dated February 25, 2021, which concluded after an investigation that OSHA's prior approach to addressing the hazards of COVID-19 leaves employees across the country at increased risk of COVID-19 infection (DOL OIG February 25, 2021). The DOL OIG report specifically recommended that OSHA reconsider its prior decision not to issue an ETS to provide the necessary protection to employees from the hazards of COVID-19.

DRAFT

Even in Combination, the Guidance and General Duty Clause Are Still Inadequate

Early in the pandemic, OSHA took the position that existing standards, together with the combination of non-mandatory guidance and General Duty Clause citations, would be sufficient to protect employees so that specific mandatory requirements would not be necessary. In theory, where existing standards did not address an issue directly, the remaining regulatory gap could be filled by guidance from OSHA, which would provide notice of COVID-19 hazards and describe feasible means of abating them, enabling OSHA to later issue a General Duty Clause citation to an employer who had failed to follow that guidance. OSHA's enforcement experience has now clearly disproven that theory. As explained above, existing standards leave an enormous regulatory gap that OSHA's guidance, together with the General Duty Clause, cannot cover. Despite publishing a voluminous collection of COVID-19 guidance online and investigating thousands of complaints, OSHA did not believe it could justify the issuance of more than six COVID-19 related General Duty Clause citations over the entire year-long span of the pandemic so far.

In practice, the combination of guidance and General Duty Clause authority has done little to protect employees where employers were not focused on that goal. The limitations identified above, including the high burden of proof for General Duty Clause citations, remain. Instead of being able to rely on clear requirements in a standard, employers were left to wade through guidance not only from OSHA but also from multiple other agencies, states, media, and other sources without any clarity as to how the different guidance products should work together or what to do when alternative guidance did not square with OSHA's guidance. Perhaps because OSHA's guidance was not mandatory, it was frequently ignored or followed only in part. As explained above, the General Duty Clause's shortcomings as an enforcement tool left OSHA, in most cases, ultimately unable to impose mandatory protections for employees.

DRAFT

In sum, based on its enforcement experience over the last year, OSHA concludes that continued reliance on existing standards, together with the combination of guidance and General Duty Clause obligations, in lieu of an ETS, will not protect employees against the grave danger posed by COVID-19.

Recent Vaccine Developments Do Not Obviate the Current Need for an ETS

The development of safe and highly effective vaccines is an encouraging development in the nation's response to COVID-19. On March 2, 2021, President Biden announced that current projections show there should be enough vaccine supply for every adult in America by the end of May, and on April 6 he announced that he would direct states to relax eligibility requirements by April 19. However, despite the remarkable success of our nation's vaccine program and the substantial promise that vaccines hold, as explained below, OSHA does not believe they eliminate the need for this standard at the current time.

First, vaccines provide no protection to workers until they actually receive them. While the supply of vaccines and their distribution continues to increase, as of the date of the promulgation of this standard, most workers have not yet completed COVID-19 vaccination. Although a majority of Americans over 65 are vaccinated, the percentage among the working-age population is much lower (CDC, March 16, 2021b; Census Bureau, June 2020). And with the two-dose vaccines in particular, the distance from a first shot to fully effective vaccination is around 6 weeks.

Meanwhile, also increasing are new virus variants, the most prevalent of which, the B.1.1.7 variant first identified in the U.K., now appears responsible for more than a quarter of the cases in the U.S. This is particularly troubling as this variant is not only more transmissible, it also appears to cause more severe disease. While the currently authorized vaccines appear

DRAFT

effective against all of variants now circulating, as noted in Grave Danger there is uncertainty about the extent of that effectiveness against newer variants. In addition, there are concerns about the effectiveness of current treatment methods, particularly monoclonal antibodies. Several variants have mutations that affect neutralization by some polyclonal and monoclonal antibodies (CDC, April 21, 2021).

Further, there is a need to continue building vaccine confidence in some parts of the population, making the ETS even more important to assure safe working conditions during the period before these workers are vaccinated. Moreover, as discussed in more depth in *Grave Danger* (Section IV of the preamble), even once vaccines become more readily available, worker health issues will still remain. Some workers are unable to be vaccinated for medical or other reasons, even if they are willing to be. These factors, along with the uneven penetration of vaccines, make the need for this ETS especially acute. We know that the Latinx and Black populations who have been disproportionately harmed by the virus also have the lowest vaccination rates (Ndugga et al., February 18, 2021). This ETS can help mitigate the disproportionate impacts of the virus for workers in these groups. Finally, while the science continues to develop, the full extent of the immune response remains unknown. Additional evidence is also needed to determine the extent to which people who are vaccinated could still be infected and transmit the disease to others, even if they themselves are protected from the worst health effects.

Furthermore, even as the pace of vaccination has accelerated, the seven-day daily average number of new cases rose by 8.4% as reported on April 2, 2020 in comparison to the previous week (CDC, April 2, 2021). Hospital admissions also rose, increasing by 4.8%. Because of the

DRAFT

level of vaccinations among people over 65, this reflects an increase in hospitalizations among younger, working-age adults.

These issues, as elaborated further in the discussion of *Grave Danger*, demonstrate that the various protections required in this ETS are still necessary, even for workplaces in which a high percentage of the workforce has been vaccinated. The evidence described above shows clearly that we are in a race between vaccines and more transmissible variants, and the best way we can help the vaccines win that race is to make sure Americans do not let up on the mitigation measures we know help reduce the spread of all variants. This ETS will help ensure that happens. As President Biden warned recently, "let me be deadly earnest with you: We aren't at the finish line. We still have a lot of work to do. We're still in a life-and-death race against this virus. Until we get more people vaccinated, we need everyone to wash their hands, socially distance, and mask up in a recommended mask from the CDC." (President Joseph Biden, April 6, 2021). Those are precisely the sorts of measures recommended by the CDC and required by this ETS.

Dr. Rochelle Walensky, the director of the CDC, recently made the same point in a particularly forceful way. She described "the recurring feeling I have of impending doom," comparing conditions in the U.S. at the end of March to those in several European countries before their recent COVID-19 spikes. But she then pointed out that same result here is not inevitable: "We are not powerless; we can change this trajectory of the pandemic. But it will take all of us, recommitting to following the public health prevention strategies consistently, while we work to get the American public vaccinated." (Walensky, March 29, 2021)

This pandemic has been a massive blow to all of American society, and addressing it requires a whole-of-government response (White House, April 2, 2021). This ETS is part of that

DRAFT

response. OSHA shares the nation's hope for the promise of recovery created by the vaccines. But in the meantime, it also shares the recognition that we have not yet succeeded in defeating the virus, and that mitigation measures are still necessary. However, although we find it necessary to continue mitigation measures for the immediate future, we can adjust as conditions change. As more of the workforce becomes vaccinated and the post-vaccine evidence base for the vaccines continues to grow, and the CDC updates its guidance, OSHA may terminate, modify, or pause the enforcement of the ETS to the extent the workplace hazard is substantially diminished. However, at this point in time, the available evidence indicates that the ETS is still necessary to protect employees across the country from the grave danger of COVID-19, and the potential for higher immunity rates later on does not obviate the need to implement the ETS now.

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## V. Need for Specific Provisions of the ETS

The Grave Danger section (Section IV.A of this preamble) identifies the danger of exposure to SARS-CoV-2 for workers and explains how the SARS-CoV-2 virus is transmitted. This section, on Need for Specific Provisions, examines the scientific underpinnings for the controls that OSHA has identified to stop that transmission in workplaces. In Section VIII, the Summary and Explanation for the various provisions of the ETS, OSHA explains how those controls must be implemented in the workplace. Not all of the requirements of the ETS are examined in this Need for Specific Provisions section. Some are addressed fully in the Summary and Explanation sections.

### 1. Introduction – Effective Infection Prevention Utilizes Overlapping Controls

An effective infection control program utilizing a suite of overlapping controls in a layered approach better ensures that no inherent weakness in any one approach results in an infection incident. OSHA emphasizes that each of the infection control practices required by the ETS provide some protection from COVID-19 by themselves, but work best when used together, layering their protective impact to boost overall effectiveness. A common depiction of this approach in use is Reason's model of accident causation dynamics, more commonly referred to as the "Swiss Cheese Model of Accident Causation" (Reason, April 12, 1990). Reason combined concepts of pathogen transmission and airplane accidents to present a model that illustrated that accidents are the result of the interrelatedness of imperfect defenses and unsafe actions that are largely unobservable until an adverse outcome becomes apparent. Using the Swiss cheese analogy, each control has certain weaknesses or "holes." The "holes" differ between different

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controls. By stacking several controls together with different weaknesses, the "holes" are blocked by the strengths of the other controls. In other words, if controls with different weaknesses are layered, then any unexpected failure of a single control is protected against by the strengths of other controls. The model provides a guiding approach to reduce incidents across many sectors (Reason et al., October 30, 2006) and that perspective is reflected in widely accepted approaches to controlling infectious diseases (HICPAC, January 1, 1996; Rusnak et al., July 31, 2004; CDC, 2012; WHO, 2016).

The CDC Healthcare Infection Control Practices Advisory Committee's (HICPAC) Isolation Guidelines, which apply to healthcare settings, are an example of established national guidelines that illustrate layered controls to prevent the transmission of infectious diseases (Siegel et al., 2007). The Isolation Guidelines recommend two tiers of precautions: standard precautions and transmission-based precautions (e.g., airborne, droplet, contact). Standard precautions, under the Isolation Guidelines, are the minimum infection prevention practices that apply to patient care, regardless of the suspected or confirmed infection status of the patient, in any setting where health care is practiced. They are based on the principle that there is a possible risk of disease transmission from any patient, patient sample, or interaction with infectious material. For standard precautions, guidance follows that a certain set of controls should be implemented to reduce infectious disease transmission regardless of the diagnosis of the patient, in part because there is always baseline risk that is not necessarily either obvious or detectable. These precautions include controls such as improved hand hygiene, use of personal protective equipment, cleaning of equipment, environmental controls, handling of bed linens, changing work practices, and patient placement. When used in concert, these approaches protect workers

DRAFT

from bodily fluids where it is reasonable to assume that they may contain infectious agents that may or may not be related to the diagnosis.

The Isolation Guidelines' second tier of precautions, transmission-based precautions, takes into consideration the transmission mechanism of specific diseases and complements standard precautions to better protect workers from the presence of known or suspected infectious agents. For instance, SARS-CoV-2, the infectious agent that causes COVID-19 is considered to be mainly transmissible through the droplet route in both healthcare and non-healthcare settings (though there is evidence for airborne transmission as noted throughout this Preamble). Droplet transmission occurs by the direct spray of large droplets onto conjunctiva or mucous membranes (e.g., the lining of the nose or mouth) of a susceptible host when an infected person sneezes, talks, or coughs. Droplet precautions are a suite of layered controls that are designed to prevent the direct spray of infectious material and supplement the suite of layered controls used for standard precautions. They are designed to protect workers from infectious agents that can be expelled in large respiratory droplets from infected individuals. These added interventions are implemented when infection is known or suspected and include placing patients in isolated rooms or physically distant within the same room, increased mask usage, and limiting patient movement. In healthcare settings, COVID-19 is considered more capable of multiple routes of transmission, including airborne. Thus, airborne precautions are added to standard in addition to droplet precautions in those settings. Airborne precautions prevent transmission of infectious agents that remain infectious over long distances when suspended in the air.

While a suite of layered controls is appropriate for controlling infectious diseases, it is important to recognize the importance of also using the hierarchy of controls when choosing which controls to include and the order in which to implement them. Briefly, the hierarchy of

DRAFT

controls refers to the concept that the best way to control for hazards is to preferentially utilize the most effective before complementing with less effective controls.[12] Ideally, the hazard is eliminated, which would likely mean using an option such as telework with respect to COVID-19 to ensure that there is no shared workspace and thus no potential for employee exposure to COVID-19. When telework is not possible, workers must be protected through the implementation of controls. Outside the realm of infection control, the utilization of an engineering control or a change in on-site work practices could alone effectively minimize a hazard in many cases. However, infection control failures often are not apparent until an outbreak occurs, resulting in many infected workers. Therefore, it is important for employers to not only adhere to the hierarchy of controls when identifying controls to implement, but also to augment layers of feasible engineering controls (e.g., adequate ventilation, barriers) with administrative and work practice controls (e.g., physical distancing, source controls such as face coverings, cleaning, disinfection, telework, health screening). Finally, personal protective equipment (gloves, respirators, face coverings) can provide the final layer of control. This approach is consistent with both OSHA and CDC guidance for protecting workers and the public from COVID-19.

In addition to the broad recognition and implementation of layered controls to protect against infectious diseases, a recent study elucidated the effectiveness of isolated and layered controls, with respect to close contacts amidst several community COVID-19 outbreaks in Thailand (Doung-ngern et al., September 14, 2020). While individual controls, such as wearing a

[12] The hierarchy of controls is a longstanding safety practice and OSHA policy. Under its hierarchy of controls policy reflected in a number of standards, OSHA typically only allows employers to rely on respirators or other PPE to the extent that engineering controls to eliminate the hazard are not feasible. See, e.g., §§ 1910.134(a) (respiratory protection) and 1926.103 (respiratory protection); 1910.1000(e) (air contaminants); 1910.95(b) (occupational noise exposure) and 1926.101 (hearing protection).

DRAFT

face covering or maintaining at least a minimum distance from others, significantly reduced cases (28% and 40%, respectively), the researchers concluded that a layered approach would be expected to reduce infections by 84%.

Several similar studies evaluated the importance of layering controls during the 2002/2003 SARS outbreak caused by SARS-CoV-1, which is a different strain of the same species of virus as the virus that causes COVID-19 (SARS-CoV-2) and has similar characteristics. Researchers assessed five Hong Kong hospitals on how the utilization of interventions affected SARS transmission (Seto et al., May 3, 2003). In total, the study evaluated 244 workers on their compliance with wearing masks, gowns, and gloves as well as adhering to hand hygiene protocols. Among the 69 workers who fully complied with the layered controls, there were no infections. However, 13 of 185 workers who used only some of the interventions were infected. The researchers concluded that the combined practice of droplet and contact precautions together significantly reduced the risk of infection from exposures to SARS-infected individuals.

Another study investigated the approaches taken to reduce SARS-CoV-1 transmission in hospitals in Taiwan during the 2003 portion of the outbreak (Yen et al., February 12, 2010). Researchers surveyed forty-eight Taiwanese hospitals that provided care for 664 SARS-CoV-1 patients, including 119 healthcare workers, to determine which controls each hospital implemented. Control measures included isolation of fever patients in the Emergency Department (ED), installation of handwashing stations in the ED, routing patients from the ED to an isolation ward, installation of fever screen stations in the ED, and installation of handwashing stations throughout the hospital. Analysis showed that while early SARS-CoV-1 case identification at fever screening stations outside the hospital could reduce transmission inside the

DRAFT

hospital by half, combining that intervention with other interventions could almost double that reduction.

A modeling effort to simulate an epidemic of seasonal influenza at a hypothetical hospital in Ann Arbor, Michigan, found that different interventions used in a layered approach would result in a greater predicted reduction in nosocomial cases (i.e., healthcare-associated infections) (Blanco et al., June 1, 2016). The study evaluated six different intervention techniques thought to be effective against influenza, including hand hygiene, employee vaccination, patient pre-vaccination, patient isolation, therapies (e.g., antibody treatments, steroids), and face coverings. The researchers found, based on the model, that while no individual intervention exceeded a 27% percent reduction in cases, utilizing all controls would prevent half of all cases.

In 2016, the World Health Organization, a specialized agency of the United Nations that is focused on international public health (WHO, 2016), addressed the use of layering interventions to reduce infections in performed systematic reviews in its "Guidelines on Core Components of Infection Prevention and Control Programmes at the National and Acute Health Care Facility Level." OSHA's perspective of layered interventions (e.g., engineering controls, work practice controls, personal protective equipment, training) is consistent with what the WHO Guidelines define as "multimodality." WHO defines multimodality as follows:

> A [layered] strategy comprises several elements or components (three or more; usually five, http://www.ihi.org/topics/bundles/Pages/default.aspx) implemented in an integrated way with the aim of improving an outcome and changing behaviour. It includes tools, such as bundles and checklists, developed by multidisciplinary teams that take into account local conditions. The five most common components include: (i) system change (availability of the appropriate infrastructure and supplies to enable infection prevention

DRAFT

and control good practices); (ii) education and training of health care workers and key players (for example, managers); (iii) monitoring infrastructures, practices, processes, outcomes and providing data feedback; (iv) reminders in the workplace/ communications; and (v) culture change within the establishment or the strengthening of a safety climate.

The WHO guidelines strongly recommend practicing multimodality/layered interventions to reduce infections based on WHO's systematic review of implementation efforts at facility-level and national scales. Based on a systematic review of 44 studies on implementing infection control practices at the facility level, and another systematic review of 14 studies on the success of National rollout programs using layered strategies, WHO concluded that using layered strategies was effective in improving infection prevention and control practices and reducing hospital acquired illnesses (WHO, 2016).

Based on the above evidence, OSHA is requiring in the ETS that employers must not only implement the individual infection control measures discussed in the following sections, but also layer their controls to protect workers from the COVID-19 hazard due to the additional protection provided to workers when multiple control measures are combined.

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DRAFT

2. COVID-19 Plans

An effective COVID-19 plan is modeled on the core components of safety and health programs, which utilize a systematic approach to reduce injuries and illnesses in the workplace. The occupational safety and health community uses various names to describe this type of systematic approach (e.g., safety and health programs, safety and health management systems, and injury and illness prevention programs) and uses the terms “plans” and “programs”

interchangeably. An effective safety and health program involves proactively and continuously identifying and fixing hazards, before employees are injured or develop disease. The approach involves trained employees and managers working together to identify and address issues before the issues become a problem. Such an approach helps employers meet their obligation under the OSH Act to provide employees a place of employment free from recognized hazards (OSHA, January 2012; OSHA, October 18, 2016). The COVID-19 plan required by this ETS encompasses the core components of this type of safety and health programs. Developing and implementing a COVID-19 plan is an essential part of an effective response to the COVID-19 hazards present in the workplace because the process involves identifying employees who are at risk of exposure to the virus and determining how they can be effectively protected from developing COVID-19 using a multi-layered approach.

Many companies that have received awards for their safety and health accomplishments have credited safety and health programs for their success. Because of the value, effectiveness, and feasibility of such programs, many countries throughout North America, Asia, and Europe require employers to implement programs to prevent injury and illness. Numerous studies and data sources provide evidence of such programs improve safety and health management practices and performance which leads to reductions in injury, illness, and fatalities. For example, a review of the impact of implementation of safety and health programs in eight states showed a reduction of injury and illness rates ranging from 9% to more than 60%, (OSHA, January 2012). In three of these states with mandatory injury and illness prevention programs, workplace fatality rates were up to 31% lower than the national average (OSHA, January 2012).

OSHA has traditionally identified seven core elements of successful safety and health programs including (1) management leadership, (2) worker participation, (3) hazard

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identification and assessment, (4) hazard prevention and controls, (5) evaluation and improvement, (6) coordination and communication at multi-employer sites, and (7) education and training (OSHA, January 2012; OSHA, October 18, 2016). The COVID-19 plan required by this ETS was developed with these elements in mind. The first core element, management leadership, involves a demonstrated commitment to establishing a safety and health culture and continuously improving safety and health in the workplace. A commitment to health and safety is demonstrated by implementing a clear plan for preventing illness and injury, and communicating the plan to all employees (including contractors and temporary staff). Designating a coordinator to track progress of the plan and ensure that all aspects of the plan are implemented further demonstrates management's commitment to employee safety and health (OSHA, 2005; OSHA, January 2012; OSHA, October 18, 2016).

The second, and one of the most important components of a safety and health program, is the participation of trained and knowledgeable employees, including those employed by other employers (e.g., contractors, temporary staff). Employees provide unique perspective and expertise because they are often the most knowledgeable people about the hazards associated with their jobs and how those hazards can be controlled. Employees who are trained to recognize hazards and appropriate controls to address those hazards and know that they can speak freely to employers, can provide valuable input on hazards that need to be addressed, which can lead to a reduction in hazards or exposure to hazards. They can also provide input on improvements that are needed to protections that have already been implemented. An emphasis on employee participation is consistent with the OSH Act, OSHA standards, and OSHA enforcement policies and procedures, which recognize the rights and roles of workers and their representatives in

DRAFT

matters of workplace safety and health (OSHA, 2005; OSHA, January 2012; OSHA, October 18, 2016).

The third core element of a safety and health program approach is hazard identification and assessment. To be most effective, hazard assessments must be conducted as a team approach with management, coordinators, and employees involved in the process. An assessment to identify safety and health hazards can include surveying the facility to observe employee work habits and evaluating employee input from surveys or meeting minutes. Specifically, the risk of exposure to biological hazards, such as the COVID-19 virus, can be assessed by determining if workers could be exposed (e.g., through close contact with co-workers or members of the public; contact with contaminated surfaces, objects, or waste) and if controls are present to mitigate those risks (OSHA, 2005; OSHA, October 18, 2016). While a standard can specify controls applicable to particular hazards, the hazard assessment can help identify where controls are needed in specific areas of a particular worksite.

The fourth core element of an effective workplace safety and health program approach is hazard prevention and control, which involves teams of managers, coordinators, and employees assessing if a hazard can be eliminated (e.g., by working at home to eliminate potential virus exposure in the workplace). When hazards cannot be eliminated, the hazard prevention process considers which hazards can be controlled by implementing work practices (e.g., regular cleaning, disinfecting, physical distancing) or controls (e.g., physical barriers, improvements to the ventilation system, face covering policy for customers and visitors). Additionally, the process of hazard prevention and control determines if PPE is required as part of a multi-layered strategy to protect workers from infectious biological agents (OSHA, 2005; OSHA, October 18, 2016).

DRAFT

The controls may function more effectively when implemented in the most targeted manner following a hazard assessment and team-based evaluation.

The fifth core element of an effective safety and health program approach is evaluation and improvement. Safety and health programs require periodic evaluation to ensure they are implemented as intended and continue to achieve the goal of preventing injury and illness. This re-evaluation can reduce hazards, or result in improvements in controls to help reduce hazards. Managers have the prime responsibility for ensuring the effectiveness of the program but managers should work as a team with coordinators and employees to continually monitor the worksite to identify what is and is not working and make adjustments to improve worker safety and health measures (OSHA, January 2012; OSHA, October 18, 2016).

The sixth core element of an effective safety and health program approach is communication and coordination between host employers, contractors, and staffing agencies. Because the employees of one employer may expose employees of a different employer to a hazard, this communication is essential to protecting all employees. An effective program ensures that before employees go to a host worksite, both the host employer and staffing agencies communicate about hazards on the worksite, procedures for controlling hazards, and how to resolve any conflicts that could affect employee safety and health (e.g., who will provide PPE). The exchange of information about each employer's plans can help reduce exposures by identifying areas where one employer may need to provide additional protections (barriers, timing of workshifts, etc.) to its employees. Additionally, exchanging contact information between employers can facilitate worker protection in case they need to report hazards or illnesses that may occur (OSHA, October 18, 2016). In order to reduce COVID-19 transmission in the workplace, it will be particularly important for employers to have clear plans about how

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they can quickly alert other employers if a worker at a multi-employer site subsequently tests positive for COVID-19 and was in close contact with workers of other employers.

The seventh core element of an effective safety and health program is education and training. Education and training ensures that employees, supervisors, and managers are able to recognize and control hazards, allowing them to work more safely and contribute to the development and implementation of the safety and health program (OSHA, 2005; OSHA, January 2012; OSHA, October 18, 2016). In *Needs for Specific Provisions* (Section V of the preamble) there is a detailed explanation about the need for training as a separate control to minimize COVID-19 transmission.

The effectiveness of a safety and health program approach in preventing injury and illnesses is recognized by a number of authoritative bodies. In its *Total Worker Health* program, the National Institute for Occupational Safety and Health (NIOSH) lists a number of core elements that are consistent with OSHA's safety and health program approaches, including demonstrating leadership commitment to safety and health, eliminating or reducing safety and health hazards, and promoting and supporting employee involvement (NIOSH, December 2016).

The International Organization for Standardization (ISO) developed ISO 45001, a consensus standard to help organizations implement a safety and health management system (ISO, 2018). ISO notes that key potential benefits of the system include reduced workplace incidents, establishment of a health and safety culture by encouraging active involvement of employees in ensuring their health and safety, reinforcement of leadership commitment to health and safety, and improved ability to comply with regulatory requirements.

The American National Standards Institute (ANSI) and American Society of Safety Professionals (ASSP) also developed a health and safety management systems standard for the

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purpose of reducing hazards and risk in a systematic manner, based on a team approach that includes management commitment and employee involvement, with an emphasis on continual improvement (ANSI/ASSP, 2019). ANSI/ASSP note the widespread acceptance that safety and health management systems can improve occupational safety and health performance. (Id.) They further highlight OSHA reports of improved safety and health performance by companies who implement programs that rely on management system principles (e.g., the Voluntary Protection Program), and that major professional safety and health organizations support management systems as effective in improving safety and health. As further proof that safety and health management systems are valuable, they note that many large and small organizations within the U.S. and internationally are implementing these systems.

Based on the best available evidence, OSHA concludes that a COVID-19 plan that is modeled on the safety and health program principles discussed above, implemented by a COVID-19 coordinator, influenced by employee input, and continuously evaluated, is an effective tool to ensure comprehensive identification and mitigation of COVID-19 hazards. As a result, OSHA concludes that a COVID-19 plan will reduce the incidence of COVID-19 in the workplace by helping to ensure that all effective measures are implemented as part of a multi-layered strategy to minimize employee exposure to COVID-19.

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3. Physical Distancing

The best available current scientific evidence demonstrates that COVID-19 spreads mainly through droplet transmission between people who are physically near each other. The basic concept is that the majority of respiratory droplets expelled from an infected person through talking, coughing, breathing, or sneezing can travel a limited distance before falling to the surface below due to gravity. Therefore, the farther a person is away from the source of the respiratory droplets, the fewer infectious viral particles are likely to reach that person's eyes, nose, or mouth. The fewer infectious viral particles that reach that person, the lower the risk of transmission. Additional explanation of transmission is discussed in *Grave Danger* (Section IV of the preamble). OSHA recognizes that this is a simplification of the complex issue of how droplets and aerosols moving through space applies to the transmission of SARS-CoV-2. Nonetheless, the broad scientific principles described in this preamble enable OSHA to describe to affected employers and employees why the protective measures required by this ETS are necessary to protect employees from exposure to the virus.

The research described below demonstrates that a significant factor in determining whether a healthy employee will become infected with COVID-19 is how close that employee is

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to other people (e.g., co-workers, customers, visitors, delivery people). Infected individuals can transmit the virus to others whether or not the infected person is experiencing symptoms, and symptoms may not be immediately noticeable, so it is important to keep all employees distanced from other people whether or not those other people exhibit symptoms. Symptomatic, asymptomatic, and pre-symptomatic transmission is discussed further in *Grave Danger* (Section IV of the preamble). The role that physical distancing plays in this ETS is thus to ensure that employees are separated from other people as much as possible so as to reduce the risk that virus-containing droplets reach employees.

Consistent with CDC guidance, OSHA defines physical distancing as maintaining a sufficient distance between two people -- generally considered to be at least six feet of separation -- such that the risk of viral transmission through inhalation of virus-containing particles from an infected individual is significantly reduced. OSHA is aware of emerging scientific literature that suggests even greater distances may be beneficial. OSHA is also aware of some literature from other countries that suggests less than six feet may be appropriate in some circumstances; however, based on the evidence summarized below, OSHA believes that anything less than six feet is not sufficient to address the level of risk established in the studies the agency has reviewed. While it is likely that a distance of greater than 6 feet will result in some lowered risk and OSHA recommends 6 feet as a minimum distance, OSHA is not aware of sufficient evidence to justify mandating a distance farther than the 6 feet recommended by the CDC. Physical distancing is a critical component of infectious disease prevention guidelines and is a key protective measure of the current COVID-19-specific prevention recommendations from the CDC, WHO, and other public health entities, as discussed in greater detail below (CDC and

DRAFT

OSHA, March 9, 2020; WHO, June 26, 2020; CalOSHA, 2020; ECDC, March 23, 2020; PHAC, May 25, 2020).

The importance of physical distancing is evident from CDC's guidance for determining who qualifies as close contacts of an individual who is COVID-19 positive. People who have been in close contact with a COVID-19-positive individual are most likely to become infected. To become infected with COVID-19, a healthy individual typically needs to inhale a certain amount of viral particles (i.e., an infectious dose). The closer that healthy individual is to an infected person emitting infectious viral particles, the greater their exposure may be. In practice, a person generally needs to be both close enough to an infectious person and near them long enough to inhale an infectious dose. It is also important to note that multiple short exposures over the course of a day can add up to a long enough period of time to receive an infectious dose of COVID-19. Therefore, CDC's definition of *close contact* is dependent on both proximity to one or more infected people and the time period over which that proximity occurred. The CDC defines close contact as "someone who was within 6 feet of an infected person for a cumulative total of 15 minutes or more over a 24-hour period starting from 2 days before illness onset (or, for asymptomatic patients, 2 days prior to test specimen collection) until the time the patient is isolated" (CDC, October 21, 2020). The CDC uses this close contact designation to help determine contact tracing to minimize transmission spread and to help communicate the risk of transmission to the public.

The CDC close contact definition describes the likely context for transmission events under most circumstances. However, it should be noted that infections can occur from exposures of less than 15 minutes. For example, one infection event was documented that resulted from only roughly five minutes of exposure (Kwon et al., November 23, 2020) and, although OSHA is

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not aware of a specific documented case, a momentary cough or sneeze in quite close proximity could plausibly cause infection as well. Thus, distancing may reduce COVID-19 exposure during even short periods of exposure.

The notion that physical distancing can protect a healthy individual from respiratory droplets is very well established for droplet-transmissible diseases and has been a topic of study for well over a hundred years (Flugge, 1897; Jennison, 1942; Duguid, November 1, 1945; Wells, November 1, 1955). Carl Flugge (1897) is credited with originating the concept of droplet transmission. In his study using settling plates to collect large droplets that were emitted from an individual, he found that droplets fell to the plates within two meters (approximately 6.6 feet). Combining this knowledge with the known presence of infectious materials in respiratory droplets, Flugge suggested that remaining two meters from infected individuals would be protective. This understanding of droplet transmission was further expanded a few decades later, when William F. Wells noted that in Flugge's study, Flugge was unable to observe a proportion of small droplets that would evaporate before settling on the plates and that these evaporated droplets traveled differently, suggesting that some measure of transmission may happen beyond the large droplet transmission that Flugge observed (November 1, 1934). Subsequently, in the 1940s and 1950s, high-speed photography improved to the point where it could capture, upon emission, most of the respiratory droplets—large and small—that formed; this line of study validated much of the groundwork that Flugge and Wells laid (Jennison, 1942; Duguid, November 1, 1945; Hamburger and Robertson, May 1, 1948; Wells, November 1, 1955). These studies illustrated that large droplets can be a major driver of disease transmission, but also that there might be exceptions to the effectiveness of physical distancing when it comes to virus-laden small droplets.

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Even though COVID-19 is a recent disease, evidence of the effectiveness of physical distancing in reducing exposures to SARS-CoV-2 has been illustrated through a variety of scientific approaches, including an experimental study by Ueki et al. (October 21, 2020), a modeling study by Li et al. (November 3, 2020), and real world observational studies by Chu et al. (June 27, 2020) and Doung-ngern et al. (September 14, 2020). In a controlled laboratory experiment performed by Ueki et al. (October 21, 2020), researchers developed a scenario where 6 mL of SARS-CoV-2 viral serum was nebulized from a mannequin's mouth to form a mist that simulated a cough. Another mannequin, which was outfitted with an artificial ventilator set to an average adult ventilation rate, collected a proportion of the mist at distances of 0.25 meters (approximately 0.8 feet), 0.5 meters (approximately 1.6 feet), and 1 meter (approximately 3.3 feet). Using the 0.25 meter distance as a baseline, increasing the distance between the mannequins reduced viral particle exposure (measured as the number of viral RNA copies) by 62% at 0.5 meters and 77% at 1 meter. The study clearly illustrates the increased protection from viral exposure that results from increasing distance between individuals.

Modeling studies also provide evidence supporting the effectiveness of physical distancing in preventing exposure to SARS-CoV-2. In Li et al. (November 3, 2020), researchers modeled exposures resulting from respiratory droplets dispersed from a simulated typical cough using simulated saliva with a SARS-CoV-2 viral concentration measured from infected individuals. The simulated cough emitted 30,558 viral copies at distances of one meter (approximately 3.3 feet) and two meters (approximately 6.6 feet) between the infectious person and the person exposed. At one meter, more than 65% of the droplet volume (about 20,000 viral copies) reached the recipient. However, almost all of the exposure was deposited below the head, with only 9 viral copies estimated to land on the area that would normally be covered by a face

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covering. When the distance was increased to two meters, 63 viral copies landed on the recipient, with only 0.6 copies expected to hit the face covering area. This study illustrates not only the benefit of distance for reducing inhalation exposure, but also for reducing contamination of clothing, which can contribute to overall exposure if a person touches their contaminated clothing and then touches their eyes, nose, or mouth.

Outside of experimental and modeling scenarios, observations in real world situations also substantiate the finding that increasing physical distance protects people from developing infections. A systematic review of 172 studies on SARS-CoV-2 (up to early May 2020), SARS-CoV-1 (a viral strain related to SARS-CoV-2), and Middle Eastern Respiratory Syndrome (MERS) (a disease caused by a virus that is similar to SARS-CoV-2 and spreads through droplet transmission) found 38 studies, containing 18,518 individuals, to use in a meta-analysis that evaluated the effectiveness of physical distancing (Chu et al., June 27, 2020). The researchers compared the infection rates for individuals who were within one meter (approximately 3.3 feet) of infected people versus the infection rates for those who were greater than one meter away. For individuals who were within one meter, the chance of viral infection was 12.8%. When distance was greater than one meter, the chance of viral infection decreased to 2.6%. Furthermore, researchers projected that with each additional meter of distance the risk would be reduced by an additional 2.02 times.

The importance of physical distancing even when people are not exhibiting symptoms was further demonstrated by a COVID-19 study from Thailand. Researchers reviewed physical distancing information collected from 1,006 individuals who had an exposure to infected individuals (Doung-ngern et al., September 14, 2020). At the time of the exposure, many of the infected individuals were not yet experiencing symptoms, and none of the exposed individuals

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included in the study were experiencing symptoms. The researchers contacted the individuals 21 days after their exposures to determine if any secondary infections had occurred. Out of 1,006 participants, 197 tested positive and 809 either tested negative or were considered low risk contacts, did not exhibit symptoms and, therefore, were not tested. The researchers then compared the incidence of secondary infections to data on how close the exposed individuals were to the infected individuals. Exposed individuals were placed into three groups: those who had direct physical contact with the infected individual, those who were within one meter (approximately 3.3 feet) but without physical contact, and those who remained more than one meter away. The study revealed that the group with direct physical contact and the group within one meter but without physical contact were equally likely to become infected with SARS-CoV-2. However, the group that remained more than one meter away had an 85% lower infection risk than the other two groups.

As noted earlier, there is additional nuance to droplet fate beyond just the general effects of gravity on large droplets. Studies evaluating the dispersion of aerosols (i.e., particles that are smaller than typical droplets) and atypical droplets in the air have created a more thorough understanding of disease transmission and the limitations on the effectiveness of physical distancing (Jones et al., August 25, 2020). The distance that droplets may be able to travel depends on their size, expelled velocity, airflow, and other environmental considerations (Xie et al., May 29, 2007; Dbouk and Drikakis, May 1, 2020; Li et al., April 22, 2020). Bahl et al. (April 16, 2020) reviewed ten studies on the horizontal spread of droplets, finding that seven of the studies observed maximum distances traveled by droplets that greatly exceeded two meters (approximately 6.6 feet); one of which suggested the possibility of travel up to eight meters (approximately 26.2 feet). Several case studies have identified incidents where transmission of

DRAFT

SARS-CoV-2 occurred over distances of 15.1 feet (Li et al., April 22, 2020), 21.3 feet (Kwon et al., November 23, 2020) and 26.2 feet (Gunther et al., October 27, 2020). These studies suggest that while maintaining a physical distance of two meters reduces transmission significantly, there is still some risk of transmission beyond two meters. Thus, these studies illustrate that physical distancing is an important control, but also why physical distancing alone is insufficient, and a multi-layered strategy that includes additional control measures is necessary to protect employees from contracting COVID-19.

As demonstrated by the studies above, it is widely accepted that physical distancing reduces transmission of infectious diseases generally, and COVID-19 specifically. While the specific distance needed to ensure maximum reduction of COVID-19 transmission can be debated, six feet has long been used in the U.S. as the minimum acceptable distance in most situations to prevent transmission of droplet-transmissible infectious diseases, and the CDC has recommended that distance to combat COVID-19 since the start of the pandemic. (CDC and OSHA, March 9, 2020)

Physical distancing strategies can be applied on an individual level (e.g., avoiding coming within six feet of another individual), a group level (e.g., canceling group activities where individuals would be in close contact), and an operational level (e.g., promoting telework, reconfiguring the infrastructure or reducing facility occupancy levels to allow sufficient space for physical distancing). As described in further detail in *Summary and Explanation* (Section VIII of the preamble), CDC and OSHA have identified various approaches to maintaining physical distance between employees, such as: reducing the number of employees on-site at one time; reducing facility occupancy levels (both for employees and customers); staggering arrival, break, and departure times to maintain distancing during specific times at work when adherence is

DRAFT

difficult; and holding on-site training or meeting activities in larger spaces to allow for sufficient distance between attendees (CDC and OSHA, 2020).

It is worth noting that several states have taken a similar approach in imposing physical distancing requirements in their states. For example, California's COVID-19 emergency standard requires that "[a]ll employees shall be separated from other persons by at least six feet, except where an employer can demonstrate that six feet of separation is not possible, and except for momentary exposure while persons are in movement" (8 CCR § 3205(c)(6)(A)) (*see Nat'l Retail Fed'n v. Cal. Dep't of Indus. Relations, Div. of Occupational Safety & Health*, Case Nos. CGC-20-588367, CPF-21-517344 (Cal. Super. Ct. Feb. 25, 2021) (order denying preliminary injunction)). Similarly, Michigan's COVID-19 emergency standard requires that the employer "keep everyone on the worksite premises at least 6 feet from one another to the maximum extent possible and to reduce congestion . . . ." (MIOSHA Emergency Rule 7, Section 3, October 14, 2020). Oregon's COVID-19 emergency standard provides that "[a]ll employers must ensure that both work activities and workflow are designed to eliminate the need for any employee to be within 6 feet of another individual in order to fulfill their job duties . . . ." (OAR 437-001-0744(3)(a)). And Virginia's permanent standard on COVID-19 similarly requires employers to "increase physical distancing between employees at the work site to six feet" (16VAC25-220-50(C)(9)(c); 16 VAC25-220-60(C)(5)) and to "[i]ncrease physical distancing between employees and other persons to six feet" (16VAC25-220-50(C)(9)(d); 16VAC25-220-60(C)(6)).

Physical distancing practices and recommendations are also well-accepted internationally as an effective measure to reduce the spread of COVID-19. The World Health Organization (WHO) recommends physical distance of at least one meter (approximately 3.3 feet) in all workplace settings, with a preference for two meters (approximately 6.6 feet) (WHO, June 26,

DRAFT

2020). WHO also recommends providing sufficient work space of at least 10 square meters for each employee where it is feasible based on work tasks. Some foreign governments have implemented physical distancing requirements and recommendations varying in distances of: one meter (e.g., Hong Kong, Singapore, United Kingdom, Norway), 1.5 meters (e.g., Germany, Spain), and 2 meters (e.g., Japan, South Korea, Canada) (Han et al., November 7, 2020; PHAC, May 25, 2020). While the required or recommended amount of distance varies between jurisdictions, it is clear that physical distancing is considered to be a critical tool in preventing the spread of COVID-19 around the world and that, even where six feet of distance cannot be maintained, maintaining as much distance as possible can help minimize the possibility of disease transmission (Chu et al., June 27, 2020; Doung-ngern et al., September 14, 2020; Li et al., November 3, 2020; Ueki et al., 2020).

Based on the best available evidence, the agency concludes that physical distancing of at least six feet is an effective and necessary tool to protect employees from COVID-19 by reducing incidence of COVID-19 illness. This conclusion applies to physical distancing on its own and also when complemented by other measures as part of a multi-layered strategy to minimize employee exposure to COVID-19.

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4. Physical Barriers

When people with COVID-19 cough, sneeze, sing, talk, yell, or breathe, they produce respiratory droplets. Epidemiological research has found that most COVID-19 transmission

DRAFT

occurs via respiratory droplets that are spread from an infected individual during close (within 6 feet) person-to-person interactions (CDC, October 5, 2020; CDC, October 28, 2020; WHO, July 9, 2020). The amount of respiratory droplets and particles released when a person breathes is significant, and the amount only increases when someone talks or yells (Asadi et al., February 20, 2019; Alsved et al., September 17, 2020; Abkarian et al., October 13, 2020).

Barriers can be used to minimize occupational exposure to SARS-CoV-2. Barriers work by preventing droplets from traveling from the source (i.e., an infected person) to an employee, thus reducing droplet transmission. When barriers are used properly, they will intercept respiratory droplets that may contain SARS-CoV-2. Barriers are particularly critical when physical distancing of 6 feet is not feasible (AIHA, August 28, 2020; Fischman and Baker, June 4, 2020; CDC, October 29, 2020; CDC, December 4, 2020; WHO, May 10, 2020; University of Washington, October 29, 2020).

When engineering controls, such as physical barriers, are appropriately installed and located, they can reduce exposure to infectious agents, such as SARS-CoV-2, without relying on changes in employee behavior (OSHA, 2009). Therefore, engineering controls are often the most effective type of control and can also be a cost-effective layer of protection (AIHA, August 28, 2020). Physical barriers are not a stand-alone measure and are only one part of a multi-layered approach for infection control. To protect employees from exposure to SARS-CoV-2, engineering controls need to be combined with work practice controls, administrative controls, and PPE to ensure adequate protection (CDC, October 29, 2020; CDC, December 4, 2020).

Physical barriers, such as plastic or acrylic partitions, are well-established and accepted as an infection control approach to containing droplet transmissible diseases. Recommendations for the use of physical barriers are commonly made in connection with pandemic events, such as

DRAFT

the 2010 pandemic influenza (See, for example, OSHA, 2009) or avian influenza pandemics (See, for example, CDC, January 23, 2014). However, physical barriers are recognized as effective engineering controls for preventing the transmission of infectious agents and, therefore, have been commonly used in other workplace settings even under non-pandemic conditions. For instance, sneeze guards are included in the FDA's 2017 Food Code, which all 50 states use for their food safety regulations (FDA, 2017). These barriers, typically placed in front of and above food items, intercept contaminants, such as respiratory droplets, that may be expelled from a person's mouth or nose (Todd et al., August 1, 2010).

Impermeable barriers intercept respiratory droplets and prevent them from reaching another individual (Fischman and Baker, June 4, 2020; Ibrahim et al., June 1, 2020; Dehghani et al., December 22 2020; University of Washington, October 29, 2020). Thus, physical barriers can be a practical solution for decreasing the transmission of infectious viral particles for a wide range of work activities and locations. Only barriers that keep respiratory droplets out of an employee's breathing zone will reduce overall exposure to SARS-CoV-2. The breathing zone is the area immediately around an individual's mouth and nose from which a person draws air when they breathe and extends 9 inches beyond a person's nose and mouth (OSHA, February 11, 2014). Additional considerations for the design and implementation of physical barriers to properly block face-to-face pathways of breathing zones, including acceptable materials and installation, is discussed in the *Summary and Explanation* (Section VIII of the preamble).

While COVID-19-related research on barriers is fairly limited due to the recent emergence and ongoing nature of the pandemic, there is some evidence of the effectiveness of physical barriers in healthcare settings during the COVID-19 pandemic. Using a surrogate for SARS-CoV-2, Mousavi et al. (August 13, 2020) designed an experimental study in which

DRAFT

general patient rooms in a healthcare facility were converted into isolation rooms constructed out of plastic barriers with zipper doors. The authors found that the use of the barrier alone could prevent 80% of the surrogate SARS-CoV-2 particles from spreading to adjacent spaces. In contrast, without the barrier, particles were easily dispersed to other areas of the facility. The barrier was actually more effective at containing particles than a solid door, as the barrier did not create changes in airflow patterns like a door does when it opens and closes.

A simulation study using a double set of plastic drapes as a barrier around a patient's head and neck during patient intubation found that the drapes were effective at minimizing contamination to the healthcare provider and patient (Ibrahim et al., June 1, 2020). Similarly, a simulation study performed in a dental healthcare setting evaluated the use of clear, flexible barriers that were fitted over the patient chair and covered the patient's head, neck, and chest; the barriers had small openings for the employee's hands. The barriers were found to reduce the number of dyed water droplets landing on the provider and in the surrounding work environment during the dental procedure (Teichert-Filho et al., August 18, 2020). A simulation study of peroral endoscopy procedures performed through the mouth found that the use of an acrylic box around a patient's head during the procedure may reduce the number of droplets transmitted to the providers performing the procedure (Gomi et al., October 21, 2020).

A separate group of researchers developed a simulation study in a realistic classroom environment to evaluate how physical barriers may impact disease transmission. They found that physical barriers were able to reduce the transmission of simulated 1um aerosolized particles from a source individual to others who were over 6 feet away by 92% (Abuhegazy et al., October 20, 2020). OSHA notes that it would be expected that large droplets, as opposed to aerosolized particles, would be reduced to a greater extent because they do not remain airborne for extended

DRAFT

periods of time unlike aerosolized particles, as noted in the Physical Distancing section of the *Need for Specific Provisions* analysis.

Researchers found that a COVID-19 outbreak among hospital food service employees was effectively contained with the prompt implementation of physical barriers in the workplace where physical distancing was not implemented (Hale and Dayot, August 13, 2020). This included installing partitions at cashier stations between employees and non-employees, as well as in food preparation areas between work stations (Hale and Dayot, August 13, 2020). A review by Nakat and Bou-Mitri (2021) summarized the best available recommendations from peer-reviewed literature, government agencies, and international organizations and all agreed that physical barriers should be used to separate employees from each other in food production work environments. Physical barriers have also been recommended on processing lines in meat and poultry processing facilities where physical distancing is not possible (Dyal et al., May 8, 2020). A recent analysis found that there was a significant reduction in COVID-19 incidence, among employees of 8 of the 13 Nebraska meat and poultry processing facilities studied, after the plants implemented universal face covering policies and installed physical barriers (Herstein et al., April 2021). In two facilities, where the installation of barriers occurred after implementing the universal face covering policy, there was a significant decrease in COVID-19 incidence among employees following the barrier installation (Herstein et al., April 2021).

Based on the best available evidence, the agency concludes that physical barriers are an effective and necessary means of, and play a vital role in, reducing transmission of SARS-CoV-2 when complemented by other measures as part of a multi-layered strategy to minimize the risks of employee exposure.

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5. Facemasks, Face Coverings, and Face Shields

As previously discussed in *Grave Danger* (Section IV of the preamble), COVID-19 infections occur mainly through exposure to respiratory droplets (referred to as droplet transmission) when a person is in close contact with someone who has COVID-19. COVID-19 can sometimes also be spread by airborne transmission, although according to the CDC,

DRAFT

available data indicate that it is more common for the virus that causes COVID-19 to spread through close contact with a person who has COVID-19 via the droplet route than through airborne transmission (CDC, October 28, 2020). As the CDC explains, when people with COVID-19 cough, sneeze, sing, talk, or breathe, they produce respiratory droplets, which can travel a limited distance—thereby potentially infecting people within close physical proximity—before falling out of the air due to gravity. Facemasks, face coverings, and face shields are all devices used for their role in reducing the risk of droplet, and potentially airborne, transmission of COVID-19. Additional discussion on the efficacy of each device is explained further below.

*Need for Facemasks and Face Coverings*

Facemasks and face coverings are simple bi-directional barriers that tend to keep droplets, and to a lesser extent airborne particulates, on the side of the filter from which they originate. The CDC (February 18, 2021) recommends wearing facemasks and face coverings to prevent getting and spreading COVID-19 mostly by blocking large respiratory droplets from either leaving the face covering of the wearer (source control) or by preventing someone else's droplets from reaching the wearer (personal protection). Depending on the quality of a facemask or face covering, it also reduces, though does not eliminate, airborne transmission through the filtering of smaller particles. The need for facemasks and face coverings in workplaces applies to any person entering the workplace (e.g., workers, customers, visitors, contractors) due to the potential for asymptomatic and pre-symptomatic transmission.

The term "facemask," as used in this ETS, is defined as an FDA-cleared or FDA-authorized surgical, medical procedure, dental, or isolation mask. These are most commonly referred to as "surgical masks" or "medical masks." Facemasks reduce the risk of droplet transmission through their dual function as both source control and personal protection (OSHA,

DRAFT

January 28, 2021; Siegel et al., 2007). Facemasks have long been recognized as an important method of source control for preventing the spread of infectious agents transmitted via respiratory droplets. Facemasks are also used to protect the person wearing them from potentially infectious splashes and droplets (e.g., respiratory secretions or blood). More details about the use of facemasks in medical settings is included in the *Need for Specific Provisions Unique to Healthcare and Associated Industries*.

As used—and further defined—in the ETS, the term "face covering" means a product worn on the face specifically covering at least the wearer's nose and mouth and is either reusable or disposable, but is not certified by the FDA. Face coverings can be either manufactured or home-made products.

Face coverings play an important dual role in protecting workers from droplet transmission of COVID-19. One of their key purposes is to function as source control. In this role, the face covering helps protect people around the wearer by reducing the number of infectious droplets released into the air by the wearer and limiting the distance traveled by any particles that are released. As a result, anyone near the wearer is exposed to fewer (if any) droplets and the transmission risk is lowered (OSHA, January 28, 2021; Siegel et al., 2007). Face coverings also serve a role of providing a degree of particulate filtration to reduce the amount of inhaled particulate matter, meaning face coverings can help protect the wearer themselves, by reducing their inhalation of droplets produced by an infected person nearby (CDC, November 20, 2020; Brooks et al., February 10, 2021).

The efficacy of any given face covering in either functioning as source control or protecting the wearer will depend on the construction, design, and material used for the face covering. The CDC has stated that additional "research is needed to expand the evidence base

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for the protective effect of cloth masks and in particular to identify the combinations of materials that maximize both their blocking and filtering effectiveness" (CDC, November 20, 2020). Because of the potential variations in protective properties, OSHA has not considered face coverings to be PPE under OSHA's general PPE standard (29 CFR 1910.132), as there is insufficient assurance that any given face covering is of safe design and construction for the work to be performed, which is required by the PPE standard.

Despite these shortcomings, many of the available face coverings have proven to be effective at providing source control, and where a face covering is also effective in providing personal protection, the wearer will be at reduced risk of, and could be protected from, infection. Accordingly, through its guidance, OSHA has strongly encouraged workers to wear face coverings when they are in close contact with others to reduce the risk of spreading COVID-19 despite the shortcomings that have prevented the agency from considering them to be PPE. And to enhance the effectiveness of any face covering used as a requirement of this standard, the ETS imposes certain minimum design criteria, consistent with CDC recommendations. Thus, the face covering must consist of at least two layers of material that is either tightly woven or non-woven, and has no visible holes or openings. CDC has found face coverings that are tightly woven and made with at least two layers are more effective at filtering droplets than face coverings that are loosely woven or consist of a single layer of fabric (CDC, April 19, 2021; CDC, November 20, 2020; Ueki et al. 2020).

OSHA's position on the importance of face coverings is supported by a substantial body of evidence. As described in further detail below, universal, consistent, and correct use of face coverings is widely recognized and scientifically supported as an important evidence-based strategy for COVID-19 control. Accordingly, the CDC recommends everyone two years of age

DRAFT

and older wear a face covering in public settings and when around people outside of their household (CDC, February 18, 2021). And, on January 21, 2021, President Biden issued Executive Order 13998, which recognizes the use of face coverings or facemasks as a necessary, science-based public health measure to prevent the spread of COVID-19, and therefore directs regulatory action to require that they be worn in compliance with CDC guidance while traveling on public transportation (e.g., buses, trains, subway) and while at airports (Executive Order 13998, 86 FR 7205, 7205 (Jan. 21, 2021); CDC, February 2, 2021). Similarly, the World Health Organization (WHO) has recognized face coverings as a key measure in suppressing COVID-19 transmission, and thus, saving lives. The WHO observes that face coverings serve two purposes, to both protect healthy people from acquiring COVID-19 and to prevent sick people from further spreading it. The WHO accordingly recommends that the general public wear face coverings in indoor settings and in outdoor settings where physical distancing cannot be maintained (WHO, December 1, 2020).

The effectiveness of face coverings in limiting the emission and spread of droplets is demonstrated in numerous studies. For example, multiple studies in which droplets were visualized while individuals were talking or a manikin was used to simulate coughs and sneezes demonstrated that two-layer face coverings limited the number of droplets released into the air, and limited the forward spread of those not captured (Fischer et al., September 2, 2020; Verma et al., June 30, 2020; CDC, November 20, 2020).

The effectiveness of face coverings in preventing infections was also observed in a number of epidemiological studies. For example, in June of 2020 an outbreak was studied aboard the USS Theodore Roosevelt, an environment notable for congregate living quarters, close working environments, and a sample of mostly young, healthy adults. The investigation found

DRAFT

that use of face coverings on board was associated with a 70% reduced risk of transmission, which demonstrates that the use of face coverings, especially among asymptomatic cases, can help mitigate future transmission (Payne et al., June 12, 2020). Another publication, released in July of 2020, included an investigation of a high-exposure event among 139 clients exposed to two symptomatic hair stylists with confirmed cases of COVID-19. Both of the stylists and all of their clients wore face coverings during their interactions. Among 67 clients subsequently tested for COVID-19, all test results were negative; no symptomatic secondary cases were reported by any clients, including those who were not tested. The study concluded that the strict use of face coverings likely mitigated the spread of COVID-19 (Hendrix et al., July 17, 2020).

Several other observational epidemiological studies have reviewed data regarding the "real-world" effectiveness of universal face covering usage. First, in a study of 124 Beijing households with one or more laboratory-confirmed case of COVID-19, face covering use by both the index patient and all family contacts before the index patient developed symptoms, reduced secondary transmission (i.e., infections occurring within two weeks of symptom onset in the index case) within the households by 79% (Wang et al., May 11, 2020). Second, a retrospective case-control study from Thailand documented that, among more than 1,000 persons interviewed as part of contact tracing investigations, those who reported having always worn a face covering during high-risk exposures experienced a greater than 70% reduced risk of infection compared with persons who did not wear face coverings under these circumstances. The risk for infection was not significantly lower in those who reported only sometimes wearing face coverings compared to those who did not wear face coverings at all. This evidence supports the conclusion that face coverings must be worn consistently and correctly to meaningfully reduce the risk of infection (Doung-ngern et al., September 14, 2020).

DRAFT

In another epidemiological study, a specialized team of contact tracers at Duke University Health System in North Carolina categorized recorded COVID-19 cases among their healthcare workers. Of the cases that were categorized as healthcare-acquired (meaning acquired as a result of either an unmasked exposure for greater than 10 minutes at less than 6 feet to another healthcare worker who was symptomatic and tested positive for the virus, or an exposure to a COVID-19 positive patient while not wearing all CDC-recommended PPE or while there was a breach in PPE), 70% were linked to an unmasked exposure to another healthcare worker. Additionally, the researchers found a significant decrease in the number of healthcare-acquired cases beginning one week following the health system's implementation of universal face covering requirements. This decrease is particularly noteworthy because the number of community-acquired cases did not significantly change during the same time frame, indicating that the universal face covering requirement was responsible for the decrease in healthcare-acquired cases (Seidelman et al., June 25, 2020). Additionally, multiple investigations involving infected passengers aboard flights longer than ten hours strongly suggest that face covering usage prevented in-flight transmissions, as demonstrated by the absence of infection developing in other passengers and crew in the 14 days following exposure (Schwartz et al., April 14, 2020; Freedman and Wilder-Smith, September 25, 2020).

Community level analyses have also confirmed the benefit of universal face covering use in: a unified hospital system (Wang et al., July 14, 2020); a German city (Mitze et al., June 1, 2020); a U.S. state (Gallaway et al., October 6, 2020); a panel of 15 U.S. states and Washington, D.C. (Lyu and Wehby, June 16, 2020; Hatzius et al., June 29, 2020); as well as both Canada (Karaivanov et al., October 1, 2020) and the U.S. (Chernozhukov et al., September 15, 2020) nationally. Each community analysis demonstrated that following universal face covering

DRAFT

directives from both organizational and political leadership, new infections were shown to fall significantly. These analyses have also shown reductions in mortality and the need for lockdowns, with their associated monetary/gross domestic product losses (Leffler et al., December 2, 2020; Hatzius et al., June 29, 2020).

Researchers from the COVID-19 Systematic Urgent Review Group Effort investigated the effects of face coverings and eye protection on virus transmission in both healthcare and non-healthcare settings. They identified 172 observational studies for their systematic review and 44 comparative studies for their meta-analysis, including data on 25,697 COVID-19, SARS, or MERS patients. They concluded for the general public, based mainly on evidence from face covering use within households and among contacts of cases, that face coverings (either disposable surgical masks or reusable multi-layer cotton face coverings) are associated with protection from viral transmission. Through the meta-analysis, combining 39 of the studies' results, they found a 14.3% reduction in the difference of anticipated absolute effect (e.g., the chance of viral infection or transmission) between no face covering and face covering groups (Chu et al., June 1, 2020).

Ueki et al. (June 25, 2020) evaluated the effectiveness of cotton face coverings, facemasks, and N95s (a commonly used respirator) in preventing transmission of SARS-CoV-2 using a laboratory experimental setting with manikins. The researchers found that all offerings provided some measure of protection as source control, limiting droplets expelled from both infected and uninfected wearers. For instance, when spaced roughly 20 inches apart, an uninfected person can reduce inhalation of infectious virus by 37% by wearing a cotton face covering. If only the infected person wears a cotton face covering, the amount breathed in by the uninfected recipient is reduced by 57%. However, if both individuals wear a cotton face

DRAFT

covering, the exposure is reduced 67%. If both are wearing facemasks, exposure is reduced by 76%. When an infected individual wore an N95, exposure was reduced by 96% or, when the seams were taped, 99.7%.

As demonstrated by the studies above, universal face covering usage leads to a substantial reduction in the emission of virus-containing droplets and consequent transmission of the virus. This is especially critical for asymptomatic or pre-symptomatic infected wearers who feel well and may not be taking other preventative measures—like self-isolation—because they are unaware of their infectiousness to others. Combined, these individuals are estimated to account for more than 50% of COVID-19 transmissions (Honein et al., December 11, 2020; Moghadas et al., July 6, 2020; Johansson et al., January 4, 2021). This figure could be substantially reduced if face coverings are universally required, even for individuals who do not feel sick. Face covering use is also especially important in indoor spaces and when physical distance of greater than six feet cannot be maintained outdoors (Honein et al., December 11, 2020). The studies reviewed above show that face coverings reduce the release of droplets but do not completely eliminate them. Likewise physical distancing reduces risk of transmission but does not completely eliminate it (Bahl et al., April 16, 2020). CDC guidance affirms that COVID-19 pandemic control requires a multipronged application of evidence-based strategies: universal face covering use, physical distancing, avoiding nonessential indoor spaces, prompt quarantine of exposed persons, protecting essential workers, enhancing ventilation and hand hygiene, and achieving widespread COVID-19 vaccination coverage (Honein et al., December 11, 2020). Similarly, the WHO advises face covering use as just one critical measure of a comprehensive package of prevention and control measures to limit the spread of COVID-19 (WHO, December 1, 2020). Therefore, face coverings are not a substitute for physical distancing

DRAFT

and both practices should be used together with other protective measures as part of a multi-layer infection prevention strategy.

*ASTM (American Society for Testing and Materials) Standard for Barrier Face Coverings*

OSHA has always considered recognized consensus standards, with design and construction specifications, when determining the PPE requirements of the agency's standards. Both the OSH Act (29 USC 655(b)(8)) and the National Technology Transfer and Advancement Act (15 U.S.C. 272 note) require the agency to generally give deference to consensus standards unless setting its own specification would better effectuate the purposes of either Act. The agency's standards regularly require PPE to conform to the specifications on consensus standards through incorporation by reference (e.g., eye and face protection, head protection, foot protection). ASTM released a specification standard on February 15, 2021, to establish a national standard baseline for barrier face coverings (ASTM F3502-21). OSHA considered incorporation of ASTM F3502-21 in this ETS, as required. However, the agency has determined that it is infeasible for the time frame of this ETS to incorporate this consensus standard or to otherwise establish additional criteria for face coverings beyond that already recommended by the CDC due to the time needed to manufacture and distribute such a new product.

As a note, OSHA has previously established that medical facemasks are essential PPE for workers in healthcare and associated industries, already used by workers under both the PPE standard (29 CFR 1910.132) and more specifically, the Bloodborne Pathogens standard (29 CFR 1910.1030). Facemasks are intended for a medical purpose, such as prevention of infectious disease transmission (including uses related to COVID-19) as source control. Facemasks can function as a barrier to protect the wearer from hazards such as splashes or large droplets of blood and bodily fluids. Facemasks must be FDA-cleared or authorized by FDA under an EUA.

DRAFT

OSHA considered the need for additional requirements for facemasks (i.e., meeting both the ASTM F3502-21 standard and also being FDA-cleared or FDA-authorized) and has concluded that it is infeasible for the time frame of this ETS due to the combined time to redesign, reapprove, manufacture, and distribute such a new product. For discussion on facemasks in healthcare and associated industries, please see the *Need for Specific Provisions Unique to Healthcare and Associated Industries*.

*Need for Face Shields*

The term "face shield," as used in this ETS, is a device typically made of clear plastic, that covers the wearer's eyes, nose, and mouth, wraps around the sides of the wearer's face, and extends below the wearer's chin. Face shields have long been recognized as effective in preventing splashes, splatters, and sprays of bodily fluids and have a role in preventing the primary route of droplet transmission, although not aerosolized transmission. As explained above, OSHA has determined based on the best available evidence that universal face covering usage is a necessary protective measure to prevent the spread of COVID-19 for any employee exposed to other people and, therefore, at risk of infection through droplet transmission. However, the use of face shields, a less protective barrier, is permitted to either supplement face coverings where there is a particular risk of droplet exposure, or as an alternative option in certain limited circumstances where face covering usage is not feasible.

Face shields are proven to provide some protection to the wearer from exposure to droplets, and OSHA has long considered face shields to be PPE under the general PPE standard (29 CFR 1910.132) and the Eye and Face Protection standard (29 CFR 1910.133) for protection of the face and eyes from splashes and sprays. The potential protective value of face shields against droplet transmission is supported by a 2014 study, in which NIOSH investigated the

DRAFT

effectiveness of face shields in preventing the transmission of viral respiratory diseases. The purpose of the study was to quantify exposure of cough aerosol droplets and examine the efficacy of face shields in reducing this exposure. Although face shields were not found to be effective against smaller particles, which can remain airborne for extended periods and can easily flow around a face shield to be inhaled, the face shields were effective in blocking larger aerosol particles (median size of 8.5 μM). Face shields worn over a respirator also reduced surface contamination of the respirator by 97%. The study's final conclusion was that face shields can be a useful complement to respiratory protections; however, they cannot be used as a substitute for respiratory protection, when needed (Lindsley et al., June 27, 2014). A recent update of the Lindsley study (Lindsley et al., January 7, 2021) found that face shields blocked only 2% of aerosol produced by coughing. These findings, though limited to the healthcare setting, suggest that face shields might be a relevant form of protection, in addition to face coverings, in both healthcare and non-healthcare settings to protect employees from droplet exposure when they could have close contact with individuals who are potentially infected with COVID-19.

Face shields have proven less effective as a method of source control or a method of personal protection than effectively-designed face coverings. For example, in considering face shields' value as source control, Verma et al. (June 30, 2020) observed the effect of a face shield on respiratory droplets produced by simulating coughs or sneezes with a manikin. The face shield initially blocked the forward motion of the droplet stream, but droplets were then able to flow around the shield and into the surrounding area. The study authors concluded that face shields alone may not be as effective as valve-less face coverings in blocking droplets. In another study, Stephenson et al. (February 12, 2021) evaluated the effectiveness of face coverings, facemasks, and face shields in reducing droplet transmission. Breathing was simulated in two

DRAFT

manikin heads (a transmitter and receiver) that were placed four feet apart. Artificial saliva containing a marker simulating viral genetic material was used to generate droplets from the transmitter head. The researchers found that face coverings, facemasks, and face shields all reduced the amount of surrogate genetic material measured in the environment and the amount that reached the receiver manikin head at four feet. While face shields reduced surrogate genetic material by 98.6% in the environment and 95.2% at the receiver, genetic material was still deposited downward in the immediate area of the transmitter, suggesting that use of face shields without a face covering could result in a contamination of shared surfaces. This limits the effectiveness of face shields alone as a method of source control for shared workspaces. Additionally, face shields used as personal protective devices showed that the face shields protected the wearer from large cough aerosols directed at the face, but were much less effective against smaller aerosols which were able to flow around the edges of the shield and be inhaled (Lindsley et al., June 27, 2014).

Based on this evidence, OSHA has determined that face shields are not generally appropriate as a substitute for a face covering because they are less effective at reducing the risk of droplet and potential airborne transmission. However, face shields do offer some protection from droplet transmission and are, accordingly, required by the ETS to be used in any circumstance where, for example, an individual may not be able to wear a face covering or facemask due to a medical condition or due to other hazards (e.g., heat stress, arc flash fire hazards). In such limited (and often temporary) situations, a face shield may be the most effective measure to add a layer of protection to reduce workers' overall COVID-19 transmission risk, particularly when combined with other protective measures.

DRAFT

Additionally, OSHA recognizes that face shields can provide some additional protection when used in addition to a face covering by protecting the wearer's eyes and preventing their face covering from being contaminated with respiratory droplets from other persons. This additional protection may be particularly useful for employees who cannot avoid close contact with others or are unable to work behinds barriers, such as food servers or hair dressers. Accordingly, the ETS allows employers to require face shields in addition to face coverings where employment circumstances might warrant the additional protection.

As previously discussed, OSHA has always considered recognized consensus standards, with design and construction specifications, when determining the PPE requirements of the agency's standards, as required by the OSH Act (29 USC 655(b)(8)) and the National Technology Transfer and Advancement Act (15 U.S.C. 272 note).

The agency has already incorporated by reference the ANSI/ISEA Z87.1, Occupational and Educational Personal Eye and Face Protection Devices consensus standard for face shields in its Eye and Face Protection standard (29 CFR 1910.133). In this ETS the agency will incorporate by reference more recent editions of the ANSI/ISEA standard than are currently provided for in the existing standard. Additionally, for the limited purpose of complying with the ETS, the agency will also allow any face shield that meets the criteria outlined in the definition of "face shield" found in the definition sections of the ETS. That is: (1) is certified to the ANSI/ISEA Z87.1-2010, 2015, or 2020 standard; or (2) covers the wearer's eyes, nose, and mouth to protect from splashes, sprays, and spatter of body fluids, wraps around the sides of the wearer's face (i.e., temple-to-temple), and extends below the wearer's chin. Any face shield that is worn for the purpose of complying with any OSHA standard other than Subpart U must still meet the requirements of 29 CFR 1910.133.

DRAFT

*Conclusion*

In closing, the best available experimental and epidemiological data support universal use of face coverings/facemasks in work settings to reduce the spread of COVID-19 through droplet transmission. Adopting universal face covering/facemask policies is necessary, as part of a multi-layered strategy combined with other non-pharmaceutical interventions such as physical distancing, hand hygiene, and adequate ventilation, to protect employees from COVID-19. Based on the proven effectiveness of universal face covering/facemask use and the effectiveness of face shields in preventing contamination of face coverings/facemasks and protecting the eyes when there is a particular risk of droplet exposure, OSHA's COVID-19 ETS includes necessary provisions for required use of face coverings, facemasks, and face shields (e.g., either as a complementary device or in such circumstances where it is not appropriate or possible to wear a face covering or facemask).

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6. Respirators

*Respirator Use in Healthcare*

As noted in *Grave Danger* (Section IV of the preamble), it is well-accepted that COVID-19 might spread through airborne transmission during aerosol generating procedures (AGPs) such as intubation. Moreover, outside of AGP scenarios, CDC has noted growing evidence that airborne droplets and particles can remain suspended in air, travel distances beyond 6 feet, and be breathed in by others (CDC, October 28, 2020). *Grave Danger* (Section IV of the preamble) notes studies showing that infectious viral particles have been collected at distances as far as 4.8 meters away from a COVID-19 patient (Lednicky et al., September 11, 2020), and airborne COVID-19 infection has been identified in a Massachusetts hospital (Klompas et al., February 9, 2021). Accordingly, the CDC recommends the use of airborne Transmission Precautions, including the use of respirators, for any healthcare workers caring for patients with suspected or confirmed COVID-19 (CDC, March 12, 2020). This airborne transmission risk is in addition to the risks associated with contact and droplet transmission. Respirators have long been recognized as an effective and mandatory means of controlling airborne transmissible diseases and the use of this personal protective equipment is regulated under OSHA's Respiratory Protection standard (29 CFR 1910.134).

The CDC has issued core guidelines for when "healthcare personnel" should use respiratory protection against COVID-19 infection (see *Interim Infection Prevention and Control*

DRAFT

*Recommendations for Healthcare Personnel During the Coronavirus Disease 2019 (COVID-19) Pandemic* (CDC, February 10, 2021)). These recommendations have been based on the most currently available information about COVID-19, such as how the virus spreads, and are applicable to all healthcare settings in the U.S. In the guidance, the CDC defines "healthcare settings" as places where healthcare is delivered, including but not limited to: acute care facilities, long-term acute care facilities, inpatient rehabilitation facilities, nursing homes, assisted living facilities, home healthcare, vehicles where healthcare is delivered (e.g., mobile clinics), and outpatient facilities (e.g., dialysis centers, physician offices). In addition, the CDC provides examples of "healthcare personnel," which include emergency medical service personnel, nurses, nursing assistants, home healthcare personnel, physicians, technicians, therapists, phlebotomists, pharmacists, students and trainees, contractual staff not employed by the healthcare facility, and persons not directly involved in patient care, but who could be exposed to infectious agents that can be transmitted in the healthcare setting (e.g., clerical, dietary, environmental services, laundry, security, engineering and facilities management, administrative, billing, and volunteer personnel). OSHA notes that the CDC's definition of healthcare personnel in healthcare settings includes healthcare support service workers who are not directly involved in patient care, along with other workers who are included in the scope of the healthcare section of the COVID-19 ETS.

The CDC describes who is at greatest risk for COVID-19 infection in a set of FAQs designed for healthcare workers (CDC, January 25, 2021). In the FAQs, the CDC notes that those currently at greatest risk of COVID-19 infection are persons who have had prolonged, unprotected close contact (i.e., within 6 feet for a combined total of 15 minutes or longer in a 24 hour period) with a patient with confirmed COVID-19, regardless of whether the patient has

DRAFT

symptoms. Moreover, according to the CDC, persons frequently in congregate healthcare settings (e.g., nursing homes, assisted living facilities) are at increased risk of acquiring infection because of the increased likelihood of close contact. In the FAQs, the CDC also reports that current data suggest that close-range aerosol transmission by droplet and inhalation, and contact followed by self-delivery to the eyes, nose, or mouth are likely routes of transmission for COVID-19, and that long-range aerosol transmission, has not been a feature of the virus. The CDC further explains that potential routes of close-range transmission include splashes and sprays of infectious material onto mucous membranes and inhalation of infectious virions (i.e., the active, infectious form of a virus) exhaled by an infected person, but that the relative contribution of each of these is not known for COVID-19.

As the CDC states in the FAQs (CDC, January 25, 2021), although facemasks are routinely used for the care of patients with common viral respiratory infections, N95 filtering facepiece respirators or equivalent (e.g., elastomeric half-mask respirators) or higher level (e.g., full facepiece respirators or PAPRs) respirators are routinely recommended to protect healthcare workers from emerging pathogens like the virus that causes COVID-19, which have the potential for transmission via small particles. The CDC further advises that while facemasks will provide barrier protection against droplet sprays contacting mucous membranes of the nose and mouth, they are not designed to protect wearers from inhaling small particles. Because of this, the CDC recommends the use of respirators for close-contact care of patients with suspected or confirmed COVID-19. The CDC recommends that N95 filtering facepiece respirators (FFRs) and higher level respirators, such as other disposable FFRs, powered air-purifying respirators (PAPRs), and elastomeric respirators, should be used when both barrier and respiratory protection is needed for healthcare workers because respirators provide better fit and filtration characteristics.

DRAFT

The CDC recommendations in *Interim Infection Prevention and Control Recommendations for Healthcare Personnel During the Coronavirus Disease 2019 (COVID-19) Pandemic* are divided into two separate categories. These include: (1) recommended infection prevention and control practices when caring for a patient with suspected or confirmed COVID-19; and (2) recommended routine infection prevention and control practices during the COVID-19 pandemic (CDC, February 10, 2021).

A topic of interest related to the selection and use of respirators is their dual role as both personal protective equipment for the wearer and also source control to reduce the potential for transmission of potentially infectious exhaled air to others. While many filtering facepiece respirators do not have an exhalation valve, other filtering facepiece respirators do. The other "higher level" level respirators referenced above, and in CDC guidance (e.g. half or full facepiece elastomeric respirators and PAPRs), do have exhalation valves. An exhalation valve is a portal in the respirator to allow unfiltered air to leave the respirator in order to reduce breathing resistance for the wearer and reduce moisture and heat buildup inside the respirator. While the exhalation valve does allow some particles to escape through the valve, it is important to compare the performance of a respirator with an exhalation valve to other acceptable forms of source control in order to determine if there is actually reduced levels of effectiveness. NIOSH studied this issue and released a technical report entitled "Filtering Facepiece Respirators with an Exhalation Valve: Measurements of Filtration Efficiency to Evaluate Their Potential for Source Control" (NIOSH, 2020). In the report, NIOSH concluded that respirators with exhalation valves were equally effective as facemasks or face coverings:

> this study found that unmitigated FFRs with an exhalation valve that were tested in an outward position (with particles traveling in the direction of exhalation)

DRAFT

> have a wide range of penetration, emitting between <1% and 55%. Further testing could measure greater particle penetration. Even without mitigation, FFRs with exhalation valves can reduce 0.35-µm MMAD particle emissions more consistently than surgical masks, procedure masks, cloth face coverings, or fabric from cotton t-shirts;… FFRs with an exhalation valve provide respiratory protection to the wearer, and this study demonstrates that they can also reduce 0.35-µm MMAD particle emissions to levels similar to or better than those provided by surgical masks and unregulated barrier face coverings.

The results that NIOSH observed can be explained in two ways. First, the majority of the leakage takes place around the seal by the nose and mouth, and respirators are designed to provide tight seals around the face so that there is only minimal leakage. Face coverings and facemasks, on the other hand, do not typically seal tightly to the face and thus significant quantities of unfiltered air with small particles will also escape through the gaps on the side and at the nose, as well as potentially through the fabric of less protective filter materials. Second, the level of filtration in facemasks and face coverings has been unregulated, so a wide range have been acceptable under CDC guidance. The CDC does not recommend that respirators with exhaust valves be used as source controls, but the CDC's last updated recommendation on this subject was published in August of 2020, four months before the NIOSH study, and cited lack of data as the basis for the warning against relying on such respirators. (CDC, August 8, 2020). Therefore, the NIOSH study with its conclusion that respirators with exhaust valves are not less adequate as source controls than other acceptable source controls, appears to represent the best available evidence. OSHA therefore concludes that at this time there is no basis for OSHA to prohibit any NIOSH-approved filtering facepiece respirator from serving as both personal

DRAFT

protective equipment and as source control. The NIOSH report also details methods of covering the filtering facepiece respirator's exhalation valve in various manners to further improve the effectiveness as source control, which OSHA considers a recommended practice, but not strictly necessary. There are also other methods that can be used to cover or filter the exhalation valve of elastomeric respirators (e.g., place a medical mask over the respirator).

*The CDC's Recommended Infection Prevention and Control Practices When Caring for a Patient with Suspected or Confirmed COVID-19.*

The CDC recommends that healthcare personnel (including workers that perform healthcare services and those that perform healthcare support services) who enter the room or area of a patient with suspected or confirmed COVID-19 adhere to Standard Precautions and use a NIOSH-approved N95 filtering facepiece or equivalent or higher-level respirator. The CDC notes in a set of FAQs that its recommendation to use NIOSH-approved N95 disposable filtering facepiece or higher-level respirators when providing care for patients with suspected or known COVID-19 is based on the current understanding of the COVID-19 virus and related respiratory viruses (CDC, January 25, 2020).

*The CDC's Recommended Routine Infection Prevention and Control Practices for Aerosol Generating Procedures (AGPs) During the COVID-19 Pandemic*

As defined under this ETS, AGPs are medical procedures that generate aerosols that can be infectious and are of respirable size (i.e., < 10 µm). While the CDC does not recommend the use of respirators for healthcare personal providing most routine care to patients who are not suspected or confirmed with COVID-19, the CDC does recommend that healthcare personnel wear an N95 or equivalent or higher-level respirator (instead of a facemask) for all AGPs, regardless of the patient's COVID-19 status, if working in facilities located in areas with

DRAFT

moderate to substantial COVID-19 community transmission (CDC, February 10, 2021). The reason for this recommendation is the high risk of airborne transmission of COVID-19 during AGPs coupled with the significant potential for asymptomatic or pre-symptomatic transmission of COVID-19. OSHA emphasizes that AGPs are more likely to generate higher concentrations of potentially infectious respiratory aerosols than coughing, sneezing, talking, or breathing, thereby putting workers performing or assisting in the conduct of AGPs at an increased risk for pathogen exposure and infection relative to conducting tasks or procedures that do not generate such a high concentration of aerosols (CDC, December 17, 2021).

As noted above, the CDC recommendations listed in *Interim Infection Prevention and Control Recommendations for Healthcare Personnel During the Coronavirus Disease 2019 (COVID-19) Pandemic* are applicable to all U.S. settings where healthcare is delivered. To this end, the recommendations on respirator use are repeated in a variety of additional CDC guidelines for specific categories of healthcare settings (e.g., nursing homes, dental settings, assisted living facilities, home health care settings). For example, in its guidance for nursing homes, the CDC recommends that residents with known or suspected COVID-19 be cared for while using all recommended PPE, including an N95 or higher-level respirator (CDC, November 20, 2020). In addition, in its guidance for dental settings, the CDC recommends that dental healthcare personnel who enter the room of a patient with suspected or confirmed COVID-19 use a NIOSH-approved N95 or equivalent or higher-level respirator, as well as other PPE (CDC, December 4, 2020). In the same dental guidance, the CDC recommends an N95 respirator or higher level respirator for dental healthcare personnel conducting AGPs on any patient (regardless of the patient's COVID-19 status), if they are working in facilities located in areas with moderate to substantial community transmission of COVID-19. Additionally, in its

DRAFT

guidance for assisted living facilities, the CDC recommends an N95 or higher-level respirator for personnel for situations where close contact with any (symptomatic or asymptomatic) resident cannot be avoided, if COVID-19 is suspected or confirmed in a resident of the assisted living facility (i.e., resident reports fever or symptoms consistent with COVID-19) (CDC, May 29, 2020). Also, in its guidance for home health care settings, the CDC recommends that when home health agency personnel are involved in the care of people with confirmed or suspected COVID-19 at their homes, the personnel adhere to relevant infection prevention and control practices as described in the core healthcare guidance *Interim Infection Prevention and Control Recommendations for Healthcare Personnel During the Coronavirus Disease 2019 (COVID-19) Pandemic* (i.e., that they use N95 or higher-level respirators) (CDC, October 16, 2020).

In addition to its infection prevention and control guidelines for healthcare personnel in healthcare settings, the CDC has issued infection prevention and control guidelines for conducting postmortem procedures on decedents/human remains during the COVID-19 pandemic in *Collection and Submission of Postmortem Specimens from Deceased Persons with Confirmed or Suspected COVID-19*) (CDC, December 2, 2020). In this guidance, the CDC recommends respirators while conducting autopsies on decedents in all cases due to the likelihood of aerosol generation during the performance of autopsies (CDC, December 2, 2020). In the same guidance, the CDC further recommends the use of a NIOSH-approved N95 respirator or higher whenever there is a risk of aerosol generation while handling human remains outside of the autopsy setting. In addition, in its guidance for funeral homes, the CDC recommends appropriate respiratory protection for any embalming procedures that will generate aerosols (CDC, November 10, 2020). The WHO has also issued guidelines for COVID-19 infection control for aerosol-generating procedures during autopsies. For example, WHO

DRAFT

recommends respirators for procedures such as the use of power saws (WHO, September 4, 2020).

Several studies report an increased risk of infection associated with AGPs, and those studies are summarized in *Grave Danger* (Section IV of the preamble). A number of organizations recognize the increased risk associated with aerosol generating procedures:

- The Infectious Diseases Society of America (ISDA) is an organization of over 12,000 physicians, scientists and public health experts who specialize in infectious diseases. Four of the eight recommendations in their widely-used Guidelines on Infection Prevention in Patients with Suspected or Known COVID-19 are related to use and strategies for use of more protective respiratory protection during aerosol-generating procedures (IDSA, April 30, 2020). The document emphasizes that the IDSA guideline panel places a high value on avoiding serious harms to exposed health care personnel, which further substantiates the need for increased protection of healthcare workers performing these procedures.
- The World Health Organization's guidance on mask use in healthcare also distinguishes aerosol-generating procedures as a higher risk activity that requires additional protection for exposed healthcare providers (WHO, December 1, 2020).
- The Joint Commission is the oldest and largest standards-setting and accrediting body for healthcare in the US. This organization accredits and certifies more than 22,000 US health care organizations and programs (The Joint Commission, January 30, 2021). The Joint Commission also makes specific recommendations for the protection of healthcare personnel performing aerosol-generating procedures (The Joint Commission, June 3, 2020). The organization supports increased protection even for patients who have tested negative for active COVID-19 infection because of the risk of false-negatives.

DRAFT

As noted above, CDC guidance recommends use of N95 or higher level respirators for healthcare personnel exposed during AGPs on any patient (regardless of the patient's COVID-19 status) in communities where COVID-19 transmission is moderate to substantial (CDC, February 10, 2021). The rationale for this requirement is that healthcare personnel working in facilities located in areas with moderate to substantial community transmission are more likely to encounter asymptomatic or pre-symptomatic patients with COVID-19. However, OSHA finds that the evidence supports the use of N95s or higher level respirators during AGPs in all cases, regardless of community transmission levels. As described in greater detail below, OSHA's finding is based on uncertainties that healthcare professionals might face in determining if COVID-19 levels in the community represent moderate to substantial transmission. In addition, there is the possibility that in areas with minimal transmission, conditions can rapidly progress to moderate to substantial transmission, and there may be a time lag before healthcare providers receive this information.

"Substantial community transmission" is defined by the CDC as large-scale community transmission, including in communal settings (e.g., schools, workplaces) (CDC, February 10, 2021). CDC defines "minimal to moderate" community transmission as sustained transmission with high likelihood or confirmed exposure within communal settings and potential for rapid increase in cases. In CDC's Indicators of Community Transmission, four levels of community burden are identified. The two measures for assessing community burden are the total number of new cases per 100,000 persons in the past 7 days and the percentage of nucleic acid amplification tests (NAATs), including RT-PCR tests that are positive during the last seven days. If two indications suggest different levels, the actions corresponding to the higher threshold should be chosen. The 'low' transmission level includes measures of 0-9 total cases per 100,000

DRAFT

persons in the past seven days and less than 5% of NAATs that are positive during the past seven days; the 'moderate' transmission level includes measures of 10-49 cases and 5-7.9% of positive NAATs; the 'substantial' transmission level includes measures of 50-99 cases and 8-9.9% of positive NAATs; and the 'high' transmission level includes measures of 100 or more cases and 10% or more positive NAATs (CDC, February 26, 2021). The map on page 6 of the CDC ASPR community profile report shows that during the week of February 8 through 14, 2021, a majority of counties in the U.S. reported 10 or more cases of COVID-19, with many reporting 100 or more cases per 100,000 (CDC ASPR, February 15, 2021). Therefore, it appears that the majority of counties in the U.S. were experiencing at least moderate levels of transmission and met the CDC criteria for the use of N95s or higher level respirators during AGPs. However, the concern remains that use of N95s or higher level respirators will not be consistently and appropriately applied because of the struggles that healthcare establishments will have in trying to keep up-to-date on the fluctuating COVID-19 case numbers in that community that they would have to process to apply that criteria.

In addition, OSHA finds that the evidence supports the use of N95s or higher level respirators during AGPs in all cases, even when community levels of transmission do not meet the criteria for moderate to substantial transmission. Several lines of evidence support this reasoning.

First, although a community may be experiencing no to minimal levels of transmission, the situation could rapidly escalate to moderate to substantial levels of transmission as a result of large-scale community transmission events, such as superspreader events that can infect a large number of people very quickly. In fact, a possibility of rapid increase is discussed in the CDC definition for minimal to moderate community transmission, as noted above. In addition, to

DRAFT

outbreaks in communal settings, including large employers such as meatpacking, prisons or colleges, could lead to substantial large-scale community transmission in a short period of time. A study of daily case reports from 30 colleges revealed that 14 experienced a spike of infections within the first two weeks of class (Lu et al., January 13, 2021). Peak seven-day incidences were well above 1,000 cases per 100,000 population, which the study notes is an order of magnitude larger than the nation-wide peaks of 70 and 150 during the first and second waves of the pandemic. Furthermore, 17 campus outbreaks resulted in infection peaks in the surrounding counties.

Because identified community transmission is a lagging indicator, a transition from minimal to moderate transmission levels could occur long before it is evident from data reviewed by health authorities. This presents a substantial health risk for healthcare workers in areas undergoing rapid changes in COVID-19 infection rates. Once the outbreak or increased level of community spread is suspected, time is required for public health data entry, confirmation, and dissemination to those who need to know. This results in valuable time lost to protect healthcare and associated industry employees. During the period before moderate to substantial levels of transmission are identified and reported to healthcare and associated industries, the employees in those industries are at risk of exposure to infected individuals in the pre-symptomatic stage. This can occur, for example, when such individuals seek care for myocardial infarctions, strokes, or other medical emergencies while they are infectious but still without symptoms of COVID-19 infection. Individuals are thought to be most infectious in the two days before experiencing symptoms and during the first few symptomatic days (Cevik et al., October 23, 2020). Persons who never experience symptoms can also transmit the virus.

DRAFT

The problems with rapid escalation is compounded by seroprevalence survey data, commonly used to estimate underreporting and disease burden, which indicates substantial underreporting of infections in the U.S. (Angulo et al., January 5, 2021). Underreporting declined from 10.8 to 3.2 times reported infections over the pandemic but the 3-fold excess indicates a sizeable pool of unknowingly infectious patients to interact with healthcare providers.

A second reason for not basing respirator use on community transmission is because cases of COVID-19 might be underestimated depending on the varying reporting approaches used by different states. For example, a recent CNN analysis reported that California, Colorado, Maryland, Missouri and Nevada publicly report only COVID-19 cases confirmed with the polymerase chain reaction test (the most common test used to detect the virus that causes COVID-19) in their online tallies (Howard, February 8, 2021). CNN reported that if antigen tests would have been included in case counts, COVID-19 cases reported by Colorado, Maryland, Missouri and Nevada would be between 5% and 50% higher during the days in the last week of January, 2021 than the data obtained by CNN. This could result in a scenario where a community appears to be at a low level of transmission but is actually experiencing moderate to substantial transmission.

A third piece of supporting evidence for the use of N95s or higher level respirators during AGPs regardless of community transmission is that the Joint Commission, the oldest and largest standards-setting and accrediting body in health care in the US, has recommended N95 or higher-level respirators for increased healthcare protection during aerosol-generating procedures for all patients since June, 2020. The Joint Commission even recommends the use of N95s or higher level respirators when performing AGPs on patients who have tested negative for active

DRAFT

COVID-19 infection because of the risk of false-negative test results. (The Joint Commission, January 30, 2021; The Joint Commission, June 3, 2020).

For the reasons discussed above, OSHA concludes that in accordance with the provisions of 29 CFR 1910.502, respirators are necessary for the protection of workers performing AGPs on all patients without regard to their COVID-19 status or the community transmission rates.

When healthcare workers could be exposed during AGPs performed on patients who are not known or suspected to have COVID-19, the employer is required to provide an N95 or higher level respirator but is not required to comply with the full requirements of the respiratory protection program under 29 CFR 1910.134. The employer must, however, comply with the requirements under 29 CFR 1910.504, which does not require a medical evaluation and fit testing and instead requires employers to provide training and ensure that employees conduct a user seal check when using the respirator. This approach will address the difficulty many employers would face if they do not currently have full respiratory protection programs in place (e.g., dentists) to implement those programs under 29 CFR 1910.134 during the finite period of the pandemic. Employers are still required to comply with the full requirements under 29 CFR 1910.134, including medical evaluations and fit testing, when N95s or higher level respirators are used to protect employees during AGPs on patients with known or suspected COVID-19. In any healthcare setting where employees are exposed to patients with known or suspected COVID-19, whether or not AGPs are performed, employers are still required to provide N95s or higher level respirators and follow all requirements under 29 CFR 1910.134.

*Respirator Use in Biomedical Laboratories*

Respiratory protection might be needed in biomedical laboratories if aerosols and droplets could be generated outside of biological safety cabinets during procedures such as

DRAFT

centrifugation and handling leaking samples, in addition to scenarios where splashes can occur (e.g., loading and unloading of sealed centrifuge cups, grinding, blending, vigorous shaking or mixing, sonic disruption, opening of containers of infectious materials whose internal pressure may be different from the ambient pressure) (WHO, February 12, 2020). However, OSHA does not find a need to specify conditions for respirator use in biomedical laboratories. Consistent with other laboratory guidelines, OSHA finds it appropriate for biomedical laboratories to conduct risk assessments to determine when respirator use is required. The CDC has issued FAQs for biosafety in laboratory settings during the COVID-19 pandemic (CDC, January 26, 2020). The FAQs recommend that, while working with specimens suspected or confirmed with COVID-19, laboratories perform a site-specific and activity-specific protocol-driven risk assessment to identify and mitigate risks and determine if enhanced biosafety precautions are warranted based on situational needs, such as high testing volumes and the likelihood of generating infectious droplets and aerosols. Per the CDC, the risk assessment should identify all potential scenarios of a particular activity that could produce a negative outcome, and should prioritize those potential negative outcomes, or risks, based on an evaluation of the likelihood and consequences of each of those identified risks. Furthermore, the risk assessment should determine the most appropriate control measures (which could include respirators in some situations), and how the system will measure the effectiveness of those control measures. The CDC FAQs for laboratory biosafety also point the public to additional information contained in the World Health Organization's *Interim Laboratory biosafety guidance related to the novel coronavirus (2019-nCoV)* (WHO, February 12, 2020). That guideline provides that, although respiratory protection is generally not a part of the core requirements, in this particular context, a local risk assessment should be conducted to determine whether the use of respiratory protection

DRAFT

is needed, especially when procedures that may create aerosols and droplets will be performed outside biosafety cabinets.

*Other Respirator Use*

Although evidence is accumulating regarding risk of airborne exposure outside of healthcare and associated industry settings, the CDC does not recommend respirator use outside of those settings. For those settings outside of healthcare and associated industries and for healthcare settings that don't involve exposure to patients suspected or confirmed to have COVID-19 or exposure during AGPs, OSHA finds it appropriate to follow CDC recommendations because, as stated, these recommendations are based on the most currently available information about COVID-19, such as how the virus spreads. Given this, improving ventilation, as described in *Need for Specific Provisions* for Ventilation, and ensuring that facemasks are FDA-cleared or authorized will provide adequate protection for employees not required to wear respirators under the ETS.

*Limited Applicability of the Respiratory Protection Standard to COVID-19*

OSHA's Respiratory Protection standard (29 CFR 1910.134) has general requirements for respiratory protection for workers exposed to respiratory hazards, including the COVID-19 virus. In the context of the pandemic, the agency has applied the Respiratory Protection standard to situations in healthcare settings where workers are exposed to suspected or confirmed sources of COVID-19. OSHA's Respiratory Protection standard has been in effect since 1998 and the purpose of those controls have been established for decades (63 FR 1152, January 8, 1998). It applies to general industry, construction, shipyard, longshoring, and marine terminal workplaces. The standard contains requirements for the administration of a respiratory protection program, with worksite-specific procedures, respirator selection, employee training, fit testing, medical

DRAFT

evaluation, respirator use, respirator cleaning, maintenance, and repair, among other requirements. It is important to note that the standard applies to "biological hazards" (63 FR 1180, January 8, 1998). Accordingly, the agency will continue to apply the Respiratory Protection standard to work tasks and situations in healthcare and associated industries as covered by 29 CFR 1910.502 in conjunction with the specific requirements in § 1910.502 intended to address hazards from COVID-19.

*Respirator Provisions Tailored to the COVID-19 Pandemic Will Clarify Employer Responsibilities*

Notwithstanding the applicability of the Respiratory Protection standard, as OSHA will explain in this discussion, it is imperative that the healthcare section of this ETS contain additional provisions related to the employer's discretion to select respirators beyond what is required by 29 CFR 1910.134. These additional requirements are necessary in order to appropriately protect workers in healthcare and associated industries. In the *Need for the ETS* (Section IV of the preamble), OSHA has addressed why existing standards in general are inadequate to address the COVID-19 hazard. In this discussion the agency focuses more specifically on how clarifications regarding respirator need and use will help address COVID-19 hazards.

Many employers are confused as to when respiratory protection is required for protection against COVID-19, leaving many unprotected healthcare and associated industry workers at high risk of becoming infected with COVID-19. This confusion has been exacerbated by two factors. First, many employers that need to provide respirators to protect their workers from COVID-19 have never needed to provide respirators to their workers in the past (e.g., many employers in the home health care or nursing home sector), or have not had to routinely provide respirators to

DRAFT

certain workers in their facilities to protect them against infectious disease hazards (e.g., the housekeeping or facilities maintenance staff in some medical facilities). Second, there have been respirator and fit testing supply shortages and a widespread misinterpretation by employers of OSHA's temporary enforcement memoranda on respiratory protection. One issue of great concern to the agency is a misunderstanding by employers about crisis capacity strategies, which are intended to serve as short term accommodation during the most dire of circumstances when the alternative would be no respiratory protection at all. Many workers report that their employers have employed crisis capacity strategies as the *de facto* daily practice, even when additional respirators were available for use. To address these issues, the ETS contains clear mandates on when respiratory protection is required for protection against COVID-19 and contains a note encouraging employers to use elastomeric respirators or PAPRs instead of filtering facepiece respirators to prevent shortages and supply chain disruption.

Most vital of HHS's initiatives to address N95 FFR shortages, the CDC began to create and issue a series of strategies to optimize supplies of disposable N95 FFRs in healthcare settings when there is limited supply (CDC, April 9, 2021). The CDC's strategies for optimizing the supply of disposable N95 FFRs offer a continuum of options for use when N95 FFR supplies are stressed, running low, or exhausted (CDC, April 9, 2021). The strategies are based on the three general strata that have been used to describe surge capacity to prioritize measures to conserve N95 FFR supplies along the continuum of care (Hick et al., June 1, 2009):

- Conventional capacity: measures consisting of engineering, administrative, and PPE controls that should already be implemented in general infection prevention and control plans in healthcare settings.

DRAFT

- Contingency capacity: measures that may be used temporarily during periods of expected N95 FFR shortages. Contingency capacity strategies should only be implemented after considering and implementing conventional capacity strategies. While current supply may meet the facility's current or anticipated utilization rate, there may be uncertainty if future supply will be adequate and therefore, contingency capacity strategies may be needed.
- Crisis capacity: strategies that are not commensurate with U.S. standards of care but may need to be considered during periods of known N95 FFR shortages. Crisis capacity strategies should only be implemented after considering and implementing conventional and contingency capacity strategies. Facilities can consider crisis capacity when the supply is not able to meet the facility's current or anticipated utilization rate.

The CDC's conventional capacity strategies for optimizing the supply of N95 FFRs, which the CDC recommends be incorporated into everyday practices, include a variety of measures, such as training on use and indications for the use of respirators, just-in-time fit testing, limiting respirators during training, qualitative fit testing, and the use of alternatives to FFRs. If not already implemented, the CDC recommends that these strategies be considered by healthcare settings in the face of a potential N95 FFR shortage before implementing contingency capacity strategies. Of note is the CDC's conventional capacity strategy recommendation to use NIOSH-approved alternatives to N95 FFRs where feasible. These include other classes of disposable FFRs, reusable elastomeric half-mask and full facepiece air purifying respirators, and reusable powered air purifying respirators (PAPRs). All of these alternatives provide equivalent or higher-level protection than N95 FFRs when properly worn. To assist employers in this effort, NIOSH maintains a searchable, online Certified Equipment List identifying all NIOSH-approved

DRAFT

respirators (NIOSH, n.d., retrieved on January 11, 2021). Since they are reusable, elastomeric respirators and PAPRs have the added advantage of being able to be disinfected, cleaned, and reused according to manufacturer's instructions. As such, they can be used by workers after the COVID-19 pandemic and during future pandemics that may again create N95 FFR shortages.

CDC's contingency capacity strategies for optimizing supplies of N95 FFRs in healthcare settings during expected shortages include the use of respirators beyond the manufacturer-designated shelf life for training and fit testing, prioritizing respirators for healthcare personnel who are using them as PPE (as opposed to using them only as source control), and the extended use of FFRs.

CDC's crisis capacity strategies for optimizing the supply of N95 FFRs in healthcare settings during known N95 FFR shortages are not commensurate with contemporary U.S. standards of care and should be implemented with caution because they place workers at increased risk of exposure to COVID-19, given the increased uncertainty and risk associated with these strategies. Crisis capacity strategies include the use of respirators beyond the manufacturer-designated shelf life for healthcare delivery, use of respirators approved under standards used in other countries that are similar to NIOSH-approved respirators, limited re-use of N95 respirators, use of additional respirators beyond the manufacturer-designated shelf-life for healthcare delivery that have not been evaluated by NIOSH, and priotizing the use of N95 respirators and well-fitting facemasks by activity type (potentially depriving some workers who need respirators in order to protect other workers at greater risk of COVID-19 exposure). The use of crisis capacity strategies is likely to increase the risk of COVID-19 exposure when compared to conventional and contingency capacity strategies. Crisis capacity strategies are only allowable because the alternative to their use is no respiratory protection, which would result in even

DRAFT

greater risk. Crisis capacity strategies are intended to be used as a temporary measure for the shortest amount of time possible and are not intended to serve as *de facto* normal operating strategies during the pandemic.

OSHA now discusses CDC's analyses and recommendations on the use of the following crisis capacity strategies as described in CDC's *Strategies for Optimizing the Supply of N95 Respirators* (April 9, 2021), as well as additional supporting CDC guidelines: use of respirators beyond the manufacturer-designated shelf life for healthcare delivery; use of respirators approved under standards used in other countries that are similar to NIOSH-approved N95 respirators; limited re-use of N95 FFRs; and prioritizing the use of N95 respirators and facemasks by activity type.

*Use of Respirators Beyond the Manufacturer-designated Shelf Life for Healthcare Delivery*

The FDA issued an Emergency Use Authorization (EUA) authorizing the use of certain NIOSH-approved respirator models in healthcare settings (FDA, March 28, 2020). This EUA includes respirator units that are past their designated shelf life. According to the CDC, many models found in U.S. stockpiles and stockpiles of healthcare facilities have been found to continue to perform in accordance with NIOSH performance standards (although fluid resistance and flammability were not assessed) (CDC, April 9, 2021). According to the CDC, consideration can be made to use N95 FFRs beyond the manufacturer-designated shelf life for care of patients with diseases for which a respirator is recommended during their care (e.g., COVID-19, tuberculosis, measles, and varicella) (CDC April 9, 2021). However, it should be emphasized that the CDC recommends that prior to using these expired respirators, consideration should be given to acquiring other NIOSH-approved respirators, including all types of FFRs, elastomeric respirators, or PAPRs, where appropriate (CDC, July 20, 2020). The CDC makes its

DRAFT

recommendation for the use of expired respirators because healthcare services are essential and must continue in the face of the COVID-19 outbreak. The CDC also recommends that users of N95s that have exceeded the manufacturer-designated shelf life be notified before their use and the importance of inspection and user seal checks should be reemphasized. In addition, the CDC does not recommend using N95s beyond the manufacturer-designated shelf life in surgical settings. For additional guidance, refer to CDC's *Considerations for Release of Stockpiled N95s Beyond the Manufacturer-Designated Shelf Life* (CDC, July 20, 2020).

*Use of Respirators Approved Under Standards Used in Other Countries that are Similar to NIOSH-approved N95 Respirators*

The FDA issued an update to the *Non-NIOSH Approved Respirator Emergency Use Authorization (EUA)* concerning non-NIOSH-approved respirators that have been approved in other countries (FDA, March 24, 2020; FDA, October 15, 2020). As described by the CDC in its *Strategies for Optimizing the Supply of N95 Respirator* (CDC, April 9, 2021), other countries approve respirators for occupational use according to country-specific standards. These products are evaluated using some methods that are similar to those used by NIOSH. According to the CDC, some methods are different but are expected to provide protection similar to NIOSH-approved FFR and elastomeric respirators. The CDC states that devices supplied by current NIOSH-approval holders producing respirators under the standards authorized in the countries listed in the EUA are expected to provide the level of protection indicated, given that a proper fit is achieved. Therefore, the CDC considers them to be suitable alternatives to provide protection during the COVID-19 pandemic when supplies are short. Per the CDC, all of the respirators listed in the EUA have protection factors of at least 10, and non-NIOSH approved products developed by manufacturers that are not NIOSH approval holders are expected to meet the

DRAFT

NIOSH performance requirements if they have been issued a certificate of approval by an authorized test laboratory indicating they conform to the relevant standards.

The CDC emphasizes that non-NIOSH-approved products developed by manufacturers who are not NIOSH approval holders should not be used when an N95 respirator is recommended (CDC, April 9, 2021). As such, in its *Factors to Consider When Planning to Purchase Respirators from Another Country* guidance, the CDC stresses that when possible NIOSH recommends the use of NIOSH-approved reusable elastomeric respirators and PAPRs as alternatives to FFRs (CDC, May 15, 2020). For additional guidance, refer to CDC's *Factors to Consider When Planning to Purchase Respirators from Another Country* (CDC, May 15, 2020).

*Limited Re-Use of N95 FFRs*

According to the CDC, re-use refers to the practice of using the same disposable N95 FFR by one healthcare worker for multiple encounters with different patients but removing it (i.e. doffing) after each encounter (CDC, April 9, 2021). This practice is often referred to as "limited reuse" because normal infection control practices generally place restrictions in place to limit the number of times the same respirator may be reused due to patient safety reasons (Fisher and Shaffer, June 27, 2014).

As described by the CDC, for pathogens for which contact transmission is not a concern, routine limited re-use of single-use disposable respirators has been practiced for decades (CDC, April 9, 2021). For example, for tuberculosis prevention, a respirator classified as disposable can be reused by the same provider as long as the respirator maintains its structural and functional integrity. The CDC recommends that if reuse must be implemented in times of shortages, healthcare personnel should be encouraged to reuse their N95 FFRs when caring for patients with tuberculosis disease first. The CDC recognizes that limited re-use of N95 FFRs when caring

DRAFT

for patients with COVID-19 infection might also become necessary in some situations; however, the CDC warns that it is unknown what the potential contribution of contact transmissions is for COVID-19, and therefore caution should be used (CDC, April 9, 2021).

Per the CDC recommendations, it is important to consult with the respirator manufacturer regarding the maximum number of donnings or uses they recommend for the N95 FFR model (CDC, April 9, 2021). In addition, if no manufacturer guidance is available, data suggest limiting the number of reuses to no more than five uses (five donnings) per device by the same healthcare worker to ensure adequate respirator performance (Bergman et al., May 1, 2012). The CDC recommends that healthcare personnel always inspect the respirator and perform a user seal check upon donning a re-used respirator. The CDC warns that N95 and other disposable FFRs should not be shared by multiple workers.

Extended use refers to the practice of wearing the same N95 respirator for repeated close contact encounters with several different patients, without removing the respirator between patient encounters. The CDC states that, during times of crisis, practicing limited re-use while also implementing extended use can be considered (CDC, April 9, 2021). The CDC warns that if limited re-use is practiced on top of extended use, caution should be used to minimize self-contamination and degradation of the respirator. Per the CDC, if no manufacturer guidance is available, a reasonable limitation should continue to be five total donnings regardless of the number of hours the respirator is worn.

The CDC notes that N95 FFRs should not be re-used when caring for patients with varicella or measles, as contact transmission poses a risk to HCP who implement this practice (CDC, April 9, 2021).

DRAFT

The CDC further advises that respirators soiled or grossly contaminated with blood, respiratory or nasal secretions, or other bodily fluids from patients should be discarded (CDC, April 9, 2021). Additionally, the CDC recommends that healthcare personnel consider using a face shield or facemask over the respirator to reduce/prevent contamination of the N95 FFR, especially during aerosol generating procedures or procedures anticipated to generate splashes and sprays. Per CDC, it is important to perform hand hygiene before and after the previously worn N95 FFR is donned or adjusted.

The CDC warns that the surfaces of a properly donned and functioning NIOSH-approved N95 FFRs will become contaminated with pathogens while filtering the inhalation air of the wearer during exposures to pathogen laden aerosols (CDC, April 9, 2021). The pathogens on the filter materials of the respirator may thus be transferred to the wearer upon contact with the respirator during activities such as adjusting the respirator, improper doffing of the respirator, or when performing a user seal check when re-donning a previously worn respirator. The CDC notes that one potentially effective strategy to mitigate the contact transfer of pathogens from the respirator to the wearer could be to issue each healthcare worker who may be exposed to patients with COVID-19 infection a minimum of five FFRs. For this strategy, each FFR will be used on a particular day and stored in a breathable paper bag until the next week. This will result in each worker requiring a minimum of five N95 FFRs if they put on, take off, care for them, and store them properly each day. This amount of time in between uses should exceed the 72 hour expected survival time for the COVID-19 virus (van Doremalen et al., March 17, 2020). If this strategy is used, the CDC warns, the total number of donnings should still not exceed five times before discarding the respirator, when no manufacturer instructions are provided to indicate otherwise.

DRAFT

*Prioritizing the use of N95 respirators and facemasks by activity type*

According to the CDC, a prioritization approach to conservation of N95 FFRs is intended to be used when N95 FFRs are so limited that routinely practiced standards of care for all healthcare personnel wearing N95 FFRs when caring for a patient with COVID-19 infection are no longer possible (CDC, April 9, 2021). The CDC states that N95 FFRs beyond their manufacture-designated shelf life, when available, are preferable to use of facemasks. The CDC advises that N95 FFRs or elastomeric respirators or PAPRs be prioritized for healthcare personnel with the highest potential exposures including being present in the room during aerosol generating procedures performed on symptomatic persons with COVID-19 infection.

In summary, the CDC offers a variety of crisis capacity strategies to be employed during known shortages of N95 FFRs. Because these strategies are not commensurate with contemporary U.S. standards of care and are associated with increased uncertainty and risk, the CDC, as well as NIOSH, recommend that prior to using these crisis capacity strategies, consideration should be given to acquiring other NIOSH-approved respirators, including other types of FFRs, elastomeric respirators, or powered air purifying respirators, for respiratory protection in healthcare settings where possible. OSHA acknowledges the potentially diminished efficacy of reused respirators or respirators past their expiration date and agrees with the CDC's and NIOSH's recommendation. Concurrently, the FDA has concluded that respirators approved by NIOSH, but not currently meeting the FDA's requirements, may be protective against the COVID-19 virus, and has provided a list of authorized emergency-use respirators for healthcare workers to assist employers in finding acceptable alternatives to N95 FFRs. OSHA agrees that whenever feasible other NIOSH-approved respirators, such as elastomeric respirators and

DRAFT

PAPRs, should be provided to healthcare and associated industry workers over employing CDC's crisis capacity strategies during known N95 FFR shortages.

OSHA notes finally that its enforcement of the Respiratory Protection standard has been complicated by the respirator and fit-testing supply shortages incurred during the pandemic. In response to these shortages, the agency issued numerous temporary enforcement guidance memoranda allowing its Compliance Safety and Health Officers (CSHOs) to exercise enforcement discretion when considering issuing citations under the Respiratory Protection standard and/or the equivalent respiratory protection provisions of other health standards during the pandemic (OSHA, n.d., Retrieved December 22, 2020). OSHA's temporary enforcement memoranda are aligned with CDC's *Strategies for Optimizing the Supply of N95 Respirators,* which recommend a variety of conventional, contingency, and crisis capacity control strategies, as mentioned above (CDC, April 9, 2021). Unfortunately, these memoranda have been widely misinterpreted by employers, resulting in additional confusion about OSHA's respiratory protection requirements during the pandemic. OSHA bases this conclusion on staff expertise and experience, as well as on reporting in news media articles (Safety + Health, April 9, 2020; Bailey and Martin, March 19, 2020). (See also *Need for the ETS* (Section IV of the preamble).) For example, employers have misinterpreted the temporary enforcement guidance memoranda as offering blanket waivers or exemptions for complying with certain provisions of the Respiratory Protection standard (e.g., annual fit-testing requirements). In addition, many employers did not understand that these memoranda allow for enforcement discretion by CSHOs only in circumstances where an employer can demonstrate that it made unsuccessful but objectively reasonable efforts to obtain and conserve supplies of FFRs and fit-testing supplies. While the memoranda were intended as guidelines for CSHOs, employer misinterpretation of these

DRAFT

memoranda has resulted in fewer protections for workers, particularly in healthcare and associated industries.

OSHA is therefore clarifying that respirators are required for the protection of workers exposed to suspected or confirmed sources of COVID-19 in healthcare settings, and in all of those cases the respirators must be used in accordance with the Respiratory Protection standard (29 CFR 1910.134). OSHA also encourages employers, where possible, to select elastomeric respirators or PAPRs instead of filtering facepiece respirators to prevent shortages and supply chain disruption. Because the crisis capacity strategy is less protective, the employer should only use crisis capacity strategies for a limited period of time and take immediate steps to purchase and use elastomeric respirators or PAPRs in order to prevent future shortages and further expose their workers to the grave danger of COVID-19.

*Conclusion*

The best available evidence demonstrates that respirator use is one means of reducing the likelihood of COVID-19 infection of the wearer when used in accordance with §1910.134. Respirators are necessary controls that provide some protection to healthcare workers, healthcare support service workers and deathcare workers when exposed to persons with known or suspected COVID-19. Respirator use also provides some protection to employees exposed during AGPs, and are a necessary control during AGPs performed on any person.

Based on the above analysis, the agency concludes that it is necessary to add respiratory protection requirements, which are tailored specifically to the COVID-19 pandemic. These requirements will assist employers in identifying when respiratory protection is required for healthcare and associated industry workers and will help address and strengthen worker protection during the pandemic. To this end, the ETS takes a prioritization approach to the

DRAFT

conservation of respirators by requiring the use of respirators only where airborne transmission is the most likely (when the healthcare section applies, and then, only when employees are exposed to persons with suspected or confirmed COVID-19, or when aerosol generating procedures are performed, or in accordance with standard and transmission-based precautions in healthcare settings, or recognized good biosafety practices in laboratories).

The increased certainty associated with the respirator requirements in the healthcare section and added flexibility of allowing employers to follow 29 CFR 1910.504 in some limited circumstances will lead to more compliance, and more compliance will lead to improved protection of workers. In addition, a note in the healthcare section of the ETS will better inform employers that they can consider selecting from other NIOSH-approved respirator options (i.e., elastomeric respirators and PAPRs) as alternatives to N95 FFRs for protection against COVID-19, as well as other respiratory infections (e.g., tuberculosis, varicella, etc.) both during the pandemic and beyond. Knowledge of alternative respiratory protection options for healthcare employers to consider will help them choose appropriate alternative respirators and help mitigate respirator supply shortages.

DRAFT

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DRAFT

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DRAFT

7. Mini Respiratory Protection Program

*Introduction*

OSHA emphasizes that when respirators are required under the ETS to protect employees against exposure to suspected or confirmed sources of COVID-19, they must be used in accordance with the Respiratory Protection standard (29 CFR 1910.134). Moreover, nothing in the ETS changes an employer's obligation to identify hazards or provide a respirator that must be used in accordance with the Respiratory Protection standard for any other workplace hazard that might require respiratory protection (e.g., silica, asbestos, airborne infectious agents such as *Mycobacterium tuberculosis*).

OSHA's Respiratory Protection standard requires employers to develop and implement a comprehensive written respiratory protection program, required worksite-specific procedures and elements that include, but are not limited to, respirator selection and use, medical evaluation, fit testing, respirator maintenance and care, and training. Establishing such a program can take time to establish and require some level of expertise that many employers do not have, particularly if they are industries that did not typically have respiratory hazards before COVID-19.

The "mini respiratory protection program" section of the ETS (29 CFR 1910.504) is designed to strengthen employee protections with a small set of provisions for the safe use of respirators designed to be easier and faster to implement than the more comprehensive respiratory protection program. The ETS is addressing an emergency health crisis, so it is critical for employers to be able to get more employee protection in place quickly. OSHA expects that this approach will facilitate additional employee choice for the additional protection provided by respirators while reducing disincentives that discourage employers from allowing respirator use when it is not required. A mini respirator program is therefore an important control to protect employees from the hazard posed by COVID-19.

DRAFT

The mini respiratory protection program section is primarily intended to be used for addressing circumstances where employees are not exposed to suspected or confirmed sources of COVID-19, but where respirator use could offer enhanced protection to employees. Examples include when a respirator could offer enhanced protection in circumstances where a less protective (in terms of filtering and fit) face covering or facemask is required under the ETS. (See 29 CFR 1910.501(f)(5), 29 CFR 1910.502(f)(4).) The decision to use a respirator in place of a face covering or facemask could be due to the higher filter efficiency and better sealing characteristics of respirators when compared to face coverings or facemasks and/or in consideration of an employer's determination during their hazard assessment of constraints on their ability to implement other ETS provisions (e.g. physical distancing and barriers).

If an employee uses a respirator in place of a face covering or facemask, then the employer must ensure that the respirator is used in accordance with the mini respiratory protection program section of the ETS as opposed to in accordance with the Respiratory Protection standard. Another example is when an employee performs an aerosol generating procedure (AGP) on a patient who is not suspected or confirmed with COVID-19. In such situations, the ETS requires the employer to provide a respirator, but only requires the employer to ensure that the respirator is used in accordance with the mini respiratory protection program section rather than in accordance with the Respiratory Protection standard (See 29 CFR 1901.502 (f)(3)(ii)(A)) because there is no exposure to a suspected or confirmed source of COVID-19. In contrast, employees performing AGPs on patients with suspected or confirmed COVID-19 must be provided with respirators that are used in accordance with the Respiratory Protection standard (See 29 CFR 1901.502 (f)(3)(i)(A).) Additionally, employers will still be obligated to provide a respirator that is used in accordance with the Respiratory Protection standard for any AGPs

DRAFT

performed on patients suspected or confirmed with an airborne disease, such as tuberculosis or measles.

In determining the need for a mini respiratory protection program section, the agency considered its experience with the existing Respiratory Protection standard. While the majority of the Respiratory Protection standard pertains to the use of respirators that are required for the protection of employees against airborne hazards, there is one provision allowing, but not requiring, employers to permit employees to wear respirators in situations where respirators are not required for protection against airborne hazards. (See 29 CFR 1910.134(c)(2).) In establishing the requirements of this provision of the Respiratory Protection standard, OSHA also establishes some general concepts to guide respirator use. These concepts include: (1) that the respirator use will not in itself create a hazard; (2) that the employer provides the respirator user with information about the safe use and limitations of respirators; and (3) that the respirator is cleaned, stored, and maintained so that its use does not present a health hazard to the user. (29 CFR 1910.134(c)(2)(i) and (ii)).

OSHA has historically imposed a different set of requirements on employers for when respirators are required to protect employees from airborne hazards as compared to when they are not required for protection against airborne hazards but are instead used voluntarily by employees. More specifically, paragraph (c)(1) of the Respiratory Protection standard requires employers to develop and implement a comprehensive written respiratory protection program with required worksite-specific procedures and elements whenever respirator use is required by the standard. As noted earlier, these elements include, but are not limited to, respirator selection and use, medical evaluation, fit testing, respirator maintenance and care, and training. In contrast, paragraph (c)(2) of the Respiratory Protection standard requires employers to

DRAFT

implement only a subset of these elements for the voluntary use of respirators, greatly reducing the obligations of employers who allow their employees to use respirators when such use is not required for employee protection. In the 1998 rulemaking, OSHA determined:

> Paragraph (c)(2) is necessary because the use of respirators may itself present a health hazard to employees who are not medically able to wear them, who do not have adequate information to use and care for respirators properly, and who do not understand the limitations of respirators. Paragraph (c)(2) is intended to allow employers flexibility to permit employees to use respirators in situations where the employees wish to do so, without imposing the burden of implementing an entire respirator program. At the same time, it will help ensure that such use does not create an additional hazard and that employees are provided with enough information to use and care for their respirators properly (63 FR 1190, January 8, 1998).

The vast majority of voluntary respirator use situations under the Respiratory Protection standard have historically involved the use of FFRs, worn merely for an employee's comfort (63 FR 1190, January 8, 1998). Examples include employees who have seasonal allergies requesting a FFR for comfort when working outdoors and employees requesting a FFR for comfort while sweeping a dusty floor (63 FR 1190, January 8, 1998). In contrast, respirator use situations under this section of the ETS will involve employers who provide a respirator or employees who want to wear a respirator, out of an abundance of caution, as enhanced protection against COVID-19. They may also opt to wear respirators other than FFRs (e.g., elastomeric respirators, PAPRs), particularly given the supply shortages of N95 FFRs experienced during the COVID-19 pandemic. Thus, the circumstances of respirator use in the ETS are not merely to accommodate individual conditions or comfort, but rather in recognition of some increased risk due to

DRAFT

asymptomatic and pre-symptomatic transmission of COVID-19 that does not rise to the level where respirators are required for to exposure to suspected or confirmed sources of COVID-19.

OSHA emphasizes that while the new set of requirements for respirator use under the ETS differ in some aspects from those specified under the Respiratory Protection standard, their intent remains the same; that is, employers who provide respirators at the request of their employees or who allow their employees to bring their own respirators into the workplace must ensure that the respirator used does not present a hazard to the health of the employee.

In the 1998 rulemaking, OSHA concluded:

> In the rare case where an employee is voluntarily using other than a filtering facepiece (dust mask) respirator (paragraph (c)(2)(ii)), the employer must implement some of the elements of a respiratory protection program, e.g., the medical evaluation component of the program and, if the respirator is to be reworn, the cleaning, maintenance, and storage components. An exception to this paragraph makes clear that, where voluntary respirator use involves only filtering facepieces (dust masks), the employer is not required to implement a written program.

Given the supply shortages of N95 FFRs experienced during the COVID-19 pandemic and the risks associated with wearing FFRs used in accordance with crisis capacity strategies, some employees may opt to wear respirators other than FFRs (e.g., elastomeric respirators, PAPRs) during the pandemic. While medical evaluation is required when employees are voluntarily wearing respirators other than FFRs under the Respiratory Protection standard, there are no requirements under the ETS to provide medical evaluations for employees wearing such respirators. The agency concludes that it would be too onerous and costly for employers to provide medical evaluations to employees wearing elastomeric respirators or PAPRs in place of

DRAFT

FFRs used in accordance with crisis capacity strategies during the short period of the ETS. However, OSHA's experience with its Respiratory Protection Standard suggests that respiratory protection can still be effective even when subject to particular safety provisions, but not subject to the full range of requirements. In place of medical evaluations, the agency has included a training requirement on how to recognize medical signs and symptoms that may limit or prevent the effective use of employer-provided respirators and what to do if the employee experiences signs and symptoms (29 CFR 1910.504 (d)(1)(v)), as well as a requirement for the discontinuation of employer-provided respirator use (see 29 CFR 1910.504(d)(4)). This requirement mandates that employees who wear employer-provided respirators must discontinue respirator use when the employer or supervisor reports medical signs or symptoms that are related to their ability to use a respirator. In addition, any employee who previously had a medical evaluation and was determined to not be medically fit to wear a respirator should not be provided with an employer-provided respirator under the ETS.

The ETS does not require employers to include any of the use requirements specified under the ETS into a written respiratory protection program. OSHA concludes that it would be too onerous for employers to incorporate these requirements into a written respiratory protection program during the short period of the ETS, particularly for those employers under the general section who have no need to have a written respiratory protection program in place for required respirator use. OSHA reemphasizes that the intent of the requirements in the mini respiratory protection program are to ensure that employees are provided with information to safely wear respirators, without imposing the burden of additional requirements for a written respiratory protection program on employers.

DRAFT

OSHA notes that unlike the voluntary use requirements specified under the Respiratory Protection standard, there are different requirements for the use of employee-provided respirators as compared to those for employer-provided respirators under the mini respiratory protection program section. This is because the agency is requiring employers to permit the use of employee-provided respirators under the healthcare section, but not requiring employers to provide respirators for use under either the general or healthcare sections, with the noted exception for AGPs in healthcare and associated industries. OSHA concludes that it is necessary to permit employees to wear their own respirators in healthcare and associated industry settings given the risk for asymptomatic and pre-symptomatic transmission and the nature of much of the work that precludes such control measures as physical distancing and barriers. However, the agency concludes that it would be too onerous to mandate as many requirements for such use as are mandated when employers are given the option of whether or not to provide employees with respirators for use.

*Requirements for Employee-Provided Respirators*

In the 1998 rulemaking, OSHA determined that complete training is not required for employees using respirators voluntarily; instead, the final rule required employers to provide the information contained in Appendix D to the Respiratory Protection standard, entitled ''Information for Employees Using Respirators When Not Required Under the Standard,'' to ensure that employees are informed of proper respirator use and the limitations of respirators (63 FR 1190-1192, January 8, 1998). Under the ETS, there is only one requirement for the use of employee-provided respirators. This requirement is for the employer to provide these employees with a specific notice, as specified under paragraph (c) of the mini respiratory protection program section. This notice is almost identical to the notice contained in Appendix D to the

DRAFT

Respiratory Protection standard, with some minor changes intended only to tailor the information to the situational needs of the COVID-19 pandemic.

*Requirements for Employer-Provided Respirators*

As noted above, under the ETS, the requirements for the use of employer-provided respirators are more expansive than the requirements for employee-provided respirators. However, OSHA notes that employers are not obligated by the ETS to provide employees with respirators that are used under most circumstances (again, noting the exception related to AGPs), so these requirements are only mandated when an employer provides employees with respirators for use. The requirements include provisions pertaining to training, user seal checks, reuse of respirators, and discontinuing use of respirators. When employers choose to provide respirators to employees, the same rationale applies as it did in the 1998 rulemaking:

> Requiring employers to undertake these minimal obligations when they allow voluntary respirator use is consistent with the fact that employers control the working conditions of employees and are therefore responsible for developing procedures designed to protect the health and safety of the employees. Employers routinely develop and enforce rules and requirements for employees to follow based on considerations of safety. For example, although an employer allows employees discretion in the types of clothing that may be worn on site, the employer would prohibit the wearing of loose clothing in areas where clothing could get caught in machinery, or prohibit the use of sleeveless shirts where there is a potential for skin contact with hazardous materials. Similarly, if an employer determines that improper or inappropriate respirator use presents a hazard to the wearer, OSHA finds that the employer must exert control over such respirator use and

DRAFT

take steps to see that respirators are safely used under an appropriate program (63 FR 1190-1191, January 8, 1998).

The training requirements for the use of employer-provided respirators expand on the basic respirator awareness notice required for the use of employee-provided respirators. They require the employer to provide training on: (a) how to inspect, put on and remove, and use a respirator; (b) the limitations and capabilities of the respirator, particularly when the respirator has not been fit tested; (c) procedures and schedules for storing, maintaining, and inspecting respirators; (d) how to perform a user seal check as described in paragraph (e) of this section; and (e) how to recognize medical signs and symptoms that may limit or prevent the effective use of respirators and what to do if the employee experiences signs and symptoms. These training requirements for respirator use are similar to the training requirements mandated under the Respiratory Protection standard for required respirator use. (See 29 CFR 1910.134(k).) OSHA concludes that more extensive training provisions are required for the use of employer-supplied respirators under the ETS because such use is likely to be based on other factors related to the risk of COVID-19, including the ability to implement other control measure (e.g., physical distancing and barriers).

The user seal check requirements mandate employers to ensure that employees conduct user seal checks and to ensure the employees correct any problems discovered during the user seal check. This is similar to the user seal check provision for required respirator use under the Respiratory Protection standard. (See 1910.134(g)(1)(iii)). OSHA concludes that ensuring that user seal checks are conducted is necessary because employees who wear respirators are not required to be fit tested under the ETS. OSHA notes that, in the 1998 rulemaking, OSHA concluded that user seal checks are important in assuring that respirators are functioning

DRAFT

properly, and that although user seal checks are not as objective a measure of facepiece leakage as a fit test, they do provide a quick and easy means of determining that a respirator is seated properly (63 FR 1239-40, January 8, 1998). Given that employees who choose to wear employer-provided respirators will likely be doing so out of an abundance of caution to protect against potential airborne transmission of SARS-CoV-2 and will not be fit tested, OSHA concludes that it is necessary for employers to train employees how to conduct a user seal check and to ensure that they are performed properly in order to improve the effectiveness of the respirator.

In the 1998 rulemaking, OSHA determined that "if the respirators being used voluntarily are reused, it is necessary to ensure that they are maintained in proper condition to ensure that the employee is not exposed to any contaminants that may be present in the facepiece, and to prevent skin irritation and dermatitis associated with the use of a respirator that has not been cleaned or disinfected" (63 FR 1190 January 8, 1998). To this end, and given the supply shortages of FFRs necessitating their reuse under certain circumstances during the COVID-19 pandemic, OSHA concludes that it is necessary to add specific requirements for the reuse of respirators used voluntarily. These requirements incorporate some CDC recommendations for the reuse of FFRs used in accordance with crisis capacity strategies (CDC, April 9, 2021).

DRAFT

**Mini Respiratory Protection Program References:**

Centers for Disease Control (CDC). (2021, April 9). *Strategies for Optimizing the Supply of N95 Respirators*. https://www.cdc.gov/coronavirus/2019-ncov/hcp/respirators-strategy/index.html. (CDC, April 9, 2021)

8. Hygiene and Cleaning

COVID-19 can also be spread through contact transmission, which occurs when a person touches another person who has COVID-19 (e.g., during a hand shake) or a surface or item contaminated with the virus (e.g., workstations, shared equipment or products) and then touches

their own eyes, nose, or mouth (CDC, October 28, 2020; CDC, April 5, 2021). Contact transmission via inanimate objects is also known as fomite transmission. While contact transmission is less common than droplet transmission, contracting COVID-19 via contact transmission remains a concern in the workplace. Contact transmission is discussed in greater detail in *Grave Danger* (Section IV of the preamble).

To protect against COVID-19 transmission, the CDC has recommended cleaning and disinfecting high touch surfaces, as well as frequent handwashing, as key prevention methods (CDC, February 25, 2021, and CDC, May 17, 2020, respectively). *Cleaning* means the removal of dirt and impurities, including germs, from surfaces using soap and water or other cleaning agents (i.e., not Environmental Protection Agency (EPA)-registered disinfectants). Cleaning alone does not kill germs, but it does minimize the risk of spreading the infection. *Disinfection* means using an EPA-registered List N disinfectant in accordance with manufacturers' instructions to kill germs on surfaces or objects. Disinfection further lowers the risk of spreading infection and the CDC recommends disinfection in indoor community settings where there has been a suspected or confirmed COVID-19 case in the previous 24 hours (CDC, April 5, 2021). Cleaning and hand hygiene are most effective in combination.

Based on the best available evidence, OSHA has determined that proper hand hygiene, cleaning, and situational disinfection of high touch surfaces and surfaces touched by someone with COVID-19, both on their own and also when complemented by other measures as part of a multi-layered strategy to minimize employee exposure to this grave COVID-19 danger. Practicing proper hand hygiene (e.g., washing hands with soap and water or using hand sanitizers containing at least 60% ethanol or 70% isopropanol), combined with routine cleaning of surfaces, minimizes the risk of contracting COVID-19 through contact with contaminated

DRAFT

surfaces, followed by touching the mouth, nose, or eyes (Honein et al., December 11, 2020). Washing hands removes germs and microbes, which can prevent workers from being infected and from contaminating surfaces they touch; thus it prevents the spread of respiratory infections such as COVID-19 and diarrheal infections. Cleaning surfaces removes harmful contaminants from surfaces, reducing the risk of COVID-19 transmission following hand contact with those surfaces. Disinfection of surfaces and equipment in indoor community settings should be done if a suspected or confirmed COVID-19 case was utilizing those areas within the past 24 hours (CDC, April 5, 2021). Hand hygiene, as well as cleaning and situational disinfection of high touch surfaces are essential practices for minimizing the risk of COVID-19 exposure in workplaces and a critical component of the ETS. Cleaning, disinfection, and hand hygiene are foundational components of standard and transmission-based precautions for infection control and prevention (Siegel et al. 2007).

Cleaning and disinfection

Respiratory secretions or droplets expelled by infected individuals can contaminate surfaces and objects (WHO, July 9, 2020). Evidence suggests that the virus that causes COVID-19 may remain viable on surfaces for hours to days (Riddell et al., October 7, 2020; van Doremalen et al., April 16, 2020; CDC, July 10, 2020), depending on the ambient environment and the type of surface (WHO, July 9, 2020). Although fomites and contaminated surfaces are not a common transmission mode of COVID-19, demonstration of surface contamination and experiences with surface contamination linked to subsequent infection transmission with other coronaviruses, have informed the development of cleaning and disinfection recommendations to mitigate the potential of fomite transmission of COVID-19 (WHO, May 14, 2020; CDC, April 5, 2021). Cleaning of visibly dirty surfaces is a best practice measure for prevention of COVID-19

DRAFT

and other viral respiratory illnesses in households and community settings. Disinfection of these surfaces may be appropriate if it is reasonable to assume that individuals with COVID-19 may have been present. Cleaning and disinfection reduces the risk of spreading infection by removing and killing germs on surfaces people frequently touch, and in areas that were occupied or visited by a person confirmed to have COVID-19 (CDC, February 25, 2021; WHO, May 14, 2020; CDC, January 5, 2021; CDC, April 5, 2021).

Scientific evidence and guidelines from the CDC and WHO support cleaning and situational disinfection of surfaces as an effective practice to prevent the transmission of infectious viruses. Human coronaviruses, including MERS coronavirus or endemic human coronaviruses (HCoV), can be efficiently inactivated by surface disinfection procedures (Kampf et al., February 6, 2020). A study of 124 Beijing households with one or more laboratory-confirmed COVID-19 positive family members demonstrated the efficacy of disinfection in preventing the transmission of COVID-19. The study found that disease transmission to family members was 77% less with use of chlorine- or ethanol-based disinfectants every day compared to use of disinfectants once in two or more days, irrespective of other protective measures taken such as mask wearing and physical distancing (Wang et al., May 11, 2020).

The World Health Organization recommends thoroughly cleaning environmental surfaces with water and detergent and applying commonly used hospital-level disinfectants, such as sodium hypochlorite (i.e., the active ingredient in chlorine bleach), for effective cleaning and disinfection (WHO, May 14, 2020). Surface disinfection with 0.1% sodium hypochlorite or 62–71% ethanol significantly reduces coronavirus infectivity on surfaces within 1 minute of exposure time (Kampf et al., February 6, 2020; CDC, July 10, 2020). The Environmental Protection Agency (EPA) has compiled List N, a list of disinfectant products that can be used

DRAFT

against the virus that causes COVID-19, including ready-to-use sprays, concentrates, and wipes (EPA, 2020). EPA includes products on List N if they have demonstrated efficacy against the COVID-19 virus, or a germ that is harder to kill than SARS-CoV-2 virus, or another human coronavirus that is similar to the SARS-CoV-2 virus (EPA, February 17, 2021).

Hand hygiene

In all settings, including settings where regular cleaning may be difficult, frequent hand washing and avoiding touching of the face should be considered the primary prevention approach to mitigate COVID-19 transmission associated with surface contamination (WHO, May 14, 2020). Hand hygiene is generally recognized as an effective intervention at preventing respiratory illnesses and infectious disease transmission (Rabie and Curtis, March 7, 2006; Haque, July 12, 2020; Rundle et al., July 22, 2020). The CDC and the WHO have determined that frequent handwashing is an essential control measure for COVID-19 prevention within the workplace, and HICPAC identifies hand hygiene as an essential element of Standard Precautions (CDC, May 17, 2020; WHO, July 9, 2020; WHO, May 14, 2020; Siegel et al., 2007).

Providing employees access to handwashing facilities, or providing them with alcohol-based hand sanitizers when hand washing facilities are not readily accessible, ensures that they are able to practice hand hygiene frequently. Such practices are consistent with CDC guidelines and studies demonstrating the effectiveness of hand hygiene, when performed correctly. To prevent virus transmission, the CDC recommends frequent hand washing with soap and water for at least 20 seconds, or using an alcohol-based hand sanitizer with at least 60% ethanol or 70% isopropanol if soap and water is not readily available (CDC, October 14, 2020; CDC, May 17, 2020). Handwashing with soap and water mechanically removes pathogens (Burton et al., January 6, 2011), and laboratory data demonstrates that hand sanitizers that contain at least 60%

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ethanol or 70% isopropanol are effective at killing the virus that causes COVID-19 (Kratzel et al., July 2020; Siddharta et al., March 15, 2017).

Experience with work settings shows that flexible hand hygiene approaches are effective to address unique scenarios in various work environments. For example, hand washing is usually emphasized over hand sanitizing, but CDC recommends the use of alcohol-based hand sanitizers as the primary method for hand hygiene in most healthcare situations (CDC, October 14, 2020). In healthcare settings, alcohol-based hand sanitizers with 60-95% alcohol effectively reduce the number of pathogens that may be present on the hands of healthcare providers, particularly after interacting with patients (CDC, May 17, 2020). In most clinical settings, unless hands are visibly soiled, an alcohol-based hand rub is preferred over soap and water due to evidence of better compliance compared to soap and water. However, CDC does recommend healthcare workers wash their hands for at least 20 seconds with soap and water when hands are visibly dirty, before eating, after using the restroom, and after caring for people with infectious diseases (CDC, May 17, 2020). Alcohol-based hand sanitizers are also important as an alternative to soap and water for workers who do not have ready access to handwashing facilities (e.g., emergency responders, construction workers, agriculture workers, etc.).

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9. Ventilation

Improving existing ventilation and ensuring optimal performance of ventilation is an effective way to reduce viral transmission in occupational populations. Work sites with existing heating, ventilation, and air conditioning (HVAC) systems can utilize improvements to, and maintenance of, high performance ventilation as part of a layered response for infectious disease control. The effectiveness of ventilation in controlling disease transmission is based on scientific research and the recommendations of well-respected occupational safety and health organizations, including government agencies.

As explained in *Grave Danger* (Section V on preamble), there is evidence of airborne COVID-19 transmission within enclosed spaces with inadequate ventilation. As a result, there is considerable support for ensuring adequate ventilation through maintenance and improvements. Federal agencies, international organizations, industry associations, and scientific researchers agree that ensuring adequate ventilation is important in reducing potential airborne transmission of COVID-19 (ASHRAE, April 14, 2020; Schoen, May 2020; WHO, May 10, 2020; AIHA, August 28, 2020; CDC, October 5, 2020; CDC, October 29, 2020; CDC, December 7, 2020; CDC, February 9, 2021; Tang et al., August 7, 2020; Morawska et al., May 27, 2020).

In one scientific brief, the CDC provides a basic overview of how ventilation can reduce the transmission of COVID-19 in indoor spaces. Once respiratory droplets are exhaled, the CDC explains, they move outward from the source and their concentration decreases through fallout

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from the air (largest droplets first, smaller later) combined with dilution of the remaining smaller droplets and particles into the growing volume of air they encounter (CDC, October 5, 2020). Without adequate ventilation, continued exhalation can lead to the amount of infectious smaller droplet and particles produced by people with COVID-19 to become concentrated enough in the air to spread the virus to other people (CDC, October 28, 2020).

Ventilation controls the transmission of COVID-19 in two ways. First, improving indoor ventilation by appropriately maximizing air exchanges and by maintaining and improving heating, ventilation, and air-conditioning (HVAC) systems can disperse and decrease the concentration of COVID-19-containing small droplets and particles suspended in the air. The lower the concentration, the less likely some of those viral particles can be inhaled into an employee's lungs; contact their eyes, nose, or mouth; or fall out of the air to accumulate on surfaces. Protective ventilation practices and interventions can reduce the airborne concentration, which reduces the overall viral dose to occupants (CDC, February 9, 2021). Improved ventilation can also significantly reduce the airborne time of respiratory droplets (Somsen et al., July 2020; CDC, February 9, 2021). As a result, the risk of transmission of COVID-19 indoors is reduced, which makes workplaces safer (Schoen, May 2020; CDC, October 29, 2020; CDC, December 7, 2020; CDC, February 9, 2021; Honein et al., December 11, 2020). Ventilation systems alone cannot completely prevent airborne transmission (EPA, 2020; CDC, December 7, 2020; CDC, February 9, 2021), but are particularly effective when implemented in conjunction with additional control measures in a layered approach, including other engineering controls and other protections required in this ETS.

Second, air filters in HVAC systems remove particles, including aerosolized particles containing COVID-19, from recirculated air streams before returning the air to workspaces.

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Increased filter efficiency is a component of the HVAC system which can be adjusted to reduce the risk of COVID-19 transmission (Schoen, May 2020; ASHRAE, April 14, 2020; CDC, October 5, 2020; CDC, December 4, 2020; CDC, December 7, 2020; Morawska et al., May 27, 2020). Minimum Efficiency Reporting Values (MERV) report a filter's ability to capture larger particles between 0.3 and 10 microns (µm). MERV ratings range from 1 to 16, and a higher rating indicates a more efficient filter. The virus that causes COVID-19 is approximately 0.125 µm in diameter; however, the virus is contained in infectious particles, droplets, and droplet nuclei (dried respiratory droplets) that are predominantly 1 µm in size and larger.

The CDC recommends increasing filtration to the highest extent possible that is compatible with the design of the HVAC system (CDC, February 9, 2021). The American Society of Heating, Refrigeration, and Air-Conditioning Engineers (ASHRAE) recommends using filters with a MERV rating of at least 13, where feasible, or the highest level compatible with the specified HVAC system, to help capture the infectious aerosols containing COVID-19 (Schoen, May 2020; ASHRAE, December 8, 2020). The use of filtration has also been supported by others, including Mousavi et al., August 26, 2020. A MERV rating of 13 is at least 85-percent efficient at capturing particles from 1 µm to 3 µm in size (Schoen, May 2020; CDC, December 4, 2020; CDC, December 7, 2020), which is the size of the particles carrying COVID-19. A MERV-14 filter is at least 90% efficient at capturing particles of this same size, and efficiencies for MERV-15 and MERV-16 filters are even greater. As such, filters with MERV ratings of 13 or greater are much more efficient at capturing particles of this size than a MERV 8 filter, which is typically used in non-healthcare commercial settings (CDC, December 7, 2020; CDC, February 9, 2021).

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The ability of HVAC systems to reduce the risk of exposure depends on many factors, including design features, operation and maintenance practices, and the quality and quantity of outdoor air supplied to the space. The CDC has emphasized that building owners and operators should ensure that ventilation systems are functioning properly and providing acceptable levels of indoor air quality for the occupancy level of the given space. Consultation with an HVAC professional will help ensure that improvements to ventilation systems are implemented in accordance with the capacity and design of the HVAC system, according to state and local building codes and guidelines, and to avoid imbalances that could negatively alter other indoor air quality parameters (e.g., temperature, humidity, moisture) (EPA, 2020; CDC, December 7, 2020; CDC, February 9, 2021).

The CDC has also recommended increasing airflow (CDC, December 7, 2020; CDC, February 9, 2021) to occupied spaces, if possible. One way to achieve this is by opening windows and doors (Howard-Reed et al., February 2002; CDC, February 9, 2021), where feasible and as weather conditions permit. However, decisions to open windows and doors should be done after evaluating other safety and health risks for occupants, such as risk of falling or breathing outdoor environmental contaminants (e.g., carbon monoxide, molds, and pollens) (CDC, October 29, 2020; CDC, December 4, 2020; CDC, December 7, 2020; CDC, February 9, 2021). In order for this type of ventilation to serve as an effective COVID-19 control, the air flow must be directed so that contaminated air is not funneled through workspaces toward another person.

Based on the best available evidence, the agency concludes that implementation of improved ventilation and maintaining HVAC system performance is an effective and necessary approach to reduce incidence of COVID-19 both on its own and also when complemented by

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other measures as part of a multi-layered strategy to minimize employee exposure to the grave COVID-19 danger.

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10. Health Screening and Medical Management

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As discussed in more detail in *Grave Danger* (Section IV of the preamble), COVID-19 is a disease that is primarily transmitted from person to person through respiratory droplets that are produced when someone breaths, talks, sneezes, or coughs, and the droplets contact the eyes, nose, or mouth of another person. It can also be transmitted by someone touching a contaminated surface and then touching their eyes, nose, or mouth. Consequently, to effectively reduce the transmission of COVID-19 in the workplace, it is necessary to have a medical management program that identifies and removes infected or likely infected employees from the workplace, and notifies employees about possible exposures to COVID-19 so they can take appropriate steps to further reduce the spread.

Screening

Regular health screening for possible indications of COVID-19 is a first step in detecting employees who might be COVID-19-positive so those employees can seek medical care or testing, or inform the employer if they have certain symptoms. While pre-symptomatic and asymptomatic infections and the non-specificity of COVID-19 symptoms make it difficult to quantify the accuracy of symptom screening in predicting COVID-19, health screening is a strategy supported by the CDC and the American College of Occupational and Environmental Medicine (ACOEM). ACOEM recommends that employers implement a medical surveillance program that includes educating and training employees on how to recognize when they may have COVID-19, in order to prevent employees with infections from entering the workplace (ACOEM, August 19, 2020).

The CDC recommends that employers conduct screening at the worksite, or train employees to be aware of and recognize the signs and symptoms of COVID-19 and to follow CDC recommendations to self-screen for symptoms before coming to work (CDC, March 8,

DRAFT

2021a). Screening for employee symptoms, particularly when combined with their recent activities (e.g., the likelihood they have had a recent exposure to COVID-19), can help determine if the employee is suspected to have COVID-19 or should be tested. Testing can be useful in guiding the treatment that employees receive for their illness as well as triggering isolation to prevent exposure to others (NASEM, October 9, 2020). The FDA (March 11, 2021) has issued a number of emergency use authorizations for COVID-19 tests that detect infections with the SARS-CoV-2 virus. CDC recommends prompt COVID-19 testing of anyone who has had a known exposure to someone with COVID-19, has had a possible exposure to someone with COVID-19, or has symptoms of COVID-19, as a strategy to reduce SARS-CoV-2 transmission (Honein et al., 2020). Based on medical advice and information provided by testing, employees can learn if they are suspected or confirmed to have COVID-19. The earlier the employee learns that he or she is infected, the more likely that workplace exposures can be avoided.

As explained below, it is necessary that employees who are suspected or confirmed to have COVID-19 be removed from the workplace to prevent transmission of the virus that causes COVID-19 to other employees. However, because COVID-19 symptoms are non-specific and common with other infectious and non-infectious conditions, not all individuals experiencing these symptoms will necessarily have COVID-19. Thus, Struyf et al. (2021) concluded that using a single sign or symptom of COVID-19 will result in low diagnostic accuracy and that combinations of symptoms increase specificity while decreasing sensitivity (explained in further detail below); however the authors also noted that studies are lacking on diagnostic accuracy of combinations of signs and symptoms.

The success of a screening strategy in identifying whether an employee has COVID-19 is based on two factors: sensitivity and specificity for identifying COVID-19. Sensitivity refers to

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the ability of the symptom screening strategy to correctly identify persons who have COVID-19. Specificity refers to the ability of the symptom screening strategy to correctly identify persons who do not have COVID-19. As an example, a systematic review and meta-analysis by Pang et al. (2020) determined a sensitivity of 0.48 and specificity of 0.93 for smell disorders in identifying COVID-19. This means that under the scenarios in which the studies were conducted, screening for smell disorders would correctly identify around 48% of individuals who have COVID-19 (sensitivity), and would correctly identify 93% of individuals who do not have COVID-19 (specificity).

A number of studies have been conducted to determine common symptoms associated with COVID-19, along with their sensitivity and specificity. In addition to the Pang et al. (2020) study, there have been several other studies strongly linking smell and taste disorders as a symptom indicative of COVID-19. In a review of 18 studies of COVID-19 patients, Printza and Constantidis (2020) reported that loss of either smell or smell and taste was reported in most studies, and that that symptom is more prevalent in COVID-19 patients than in patients suffering from other respiratory infections. The report also found that the loss of smell was more prevalent among patients with a less severe case of COVID-19 disease. Four systematic reviews, three of which included meta-analyses, reported that for smell or taste disorders, sensitivity ranged from 0.41 to 0.65 and specificity ranged from 0.90 to 0.93 (Pang et al., 2020; Printza and Constantidis, 2020; Kim et al., 2021; Struyf et al., 2021).

A systematic review found that while loss of taste or smell is the most specific symptom of COVID-19, the most commonly reported symptoms of COVID-19 were fever, cough, fatigue, shortness of breath, and sputum production (Alimohamadi et al., 2020). In another review of a convenience sample (i.e., a non-randomly selected sample based on availability, opportunity, or

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convenience) of COVID-19 patients in the United States, 96% of patients reported having a fever, a cough, or shortness of breath (Burke et al., 2020). The review also found that 68% of hospitalized patients experienced all three of those symptoms, but only 31% of non-hospitalized patients reported all three symptoms. A systematic review by Kim et al. (2021) determined sensitivity and specificity, respectively, for fever (0.6, 0.55), cough (0.59, 0.39), and difficulty breathing (0.18, 0.84).

Although not intended to identify individuals who could potentially have COVID-19, and the diagnostic accuracy of the approach is not known, the surveillance definition used by the Council of State and Territorial Epidemiologists (CSTE) provides insight on an approach to using symptoms to identify possible cases of COVID-19 in the absence of a more likely determination by a healthcare provider. The CSTE surveillance definition for COVID-19 includes: (1) at least two of the following symptoms: fever (measured or subjective), chills, rigors (i.e., shivering), myalgia (i.e., muscle aches), headache, sore throat, nausea or vomiting, diarrhea, fatigue, congestion or runny nose; or (2) any one of the following symptoms: cough, shortness of breath, difficulty breathing, new olfactory (i.e., smell) disorder, new taste disorder; or (3) severe respiratory illness with a least one of the following: clinical or radiographic evidence of pneumonia, acute respiratory distress syndrome (ARDS) (CSTE, 2020).

Given the non-specificity of COVID-19 symptoms, consultation with a licensed healthcare provider can provide more insight on the likelihood that an employee with certain symptoms has COVID-19. A licensed healthcare provider can elicit key clinical information, such as timing, frequency, intensity, and other factors in diagnosing the patient, after considering different medical explanations. A licensed healthcare provider can also elicit additional clinical information (e.g., pre-existing medical conditions), elicit epidemiologic information (e.g.,

DRAFT

exposure to COVID-19, travel history, rates of community transmission), and order laboratory testing to assist with the diagnosis of COVID-19 and differentiation from other medical conditions.

In general, the presence of COVID-19 symptoms can alert employees that they may have COVID-19, which will allow them to take appropriate next steps. Thus, by monitoring for COVID-19 symptoms through regular health screening, employees can better address their personal health and take the steps necessary to avoid potentially infecting other people by seeking medical attention and getting tested for COVID-19 as appropriate; informing their employer if they are suspected or confirmed to have COVID-19; informing their employer of certain concerning symptoms; and remaining away from the workplace where appropriate. Therefore, health screening is an effective strategy for preventing the transmission of COVID-19 in the workplace.

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Employee Notification to Employer of COVID-19 Illness or Symptoms

Employers can reduce workplace exposures by preventing employees who are, or could be, COVID-19 positive from entering the workplace and transmitting the disease to others. But to do so employers must be aware that an employee is suspected or confirmed to have COVID-19 or is symptomatic. The *Summary and Explanation* section of this preamble includes more discussion of the precise criteria and rationale for when an employee is required to notify an employer that they are suspected or confirmed to have COVID-19 or are experiencing certain types of symptoms. It is critical that employees make their employers aware promptly after the employee is suspected or confirmed to have COVID-19 through test, medical diagnosis, or the specific symptoms of concern discussed in the *Summary and Explanation* section. With this information the employer can act to help prevent the spread of the virus in the workplace.

Employer Notification to Employees of COVID-19 Exposure in the Workplace

Notifying employees of a possible exposure to someone confirmed to have COVID-19 is an important and effective intervention to reduce transmission. Given the methods of transmission of the virus that causes COVID-19, employees possibly exposed—and thereby needing to be notified—include any employee who was in close contact with the individual with COVID-19, or any employee who worked in the same physical space around the same time as the individual with COVID-19 and consequently may have had contact with that individual or touched a contaminated surface. As the CDC has recognized, notification is important because it allows for an exchange of information with the person exposed to someone with COVID-19 and helps ensure that person can pursue quarantine, timely testing, medical evaluation, and other necessary support services (CDC, June 5, 2020). Notification also acts as a complement to an employer's regular health screening program by informing employees who may have been exposed to COVID-19 in the workplace, so that they can appropriately assess and monitor their health and report any symptoms that may develop to their employer. It is also important for employers to notify other employers whose employees may have had close contact or been in the same area as those infected individuals so those employers can notify their employees.

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The impact that notification of possible COVID-19 exposures can have in reducing COVID-19 transmission was demonstrated in a study by Kucharski et al. (2020), which found that when location-specific contact tracing and notification was used to make decisions on isolation and home quarantine, transmission of COVID-19 was reduced by 64% when contact tracing was performed manually and 47% when performed by an app. However, the authors found that while notification is effective in helping to decrease the spread of COVID-19 by

making individuals aware of potential infections, it is not a standalone measure. Notification must be used in a layered approach in order to create an effective infection control plan.

Medical Removal From the Workplace

Employers can substantially reduce disease transmission in the workplace by removing employees who are suspected or confirmed to have COVID-19 by a licensed healthcare provider, or who have developed certain symptoms or combinations of symptoms associated with COVID-19. Employers can also reduce the risk of COVID-19 in the workplace by removing employees who are at risk of developing COVID-19 because they were recently exposed to someone with COVID-19 in the workplace. According to the CDC, a major mitigation effort for COVID-19 is "to reduce the rate at which someone infected comes in contact with someone not infected . . . ." (CDC, February 16, 2021).

The ETS focuses on removing employees from the workplace, rather than specifying requirements for quarantine or isolation that are typically outside the control of the employer because they would occur away from the workplace, but the concept of separating infected or potentially infected individuals from others is the same. Both the CDC and ACOEM endorse the use of isolation and quarantine as measures needed to reduce this rate of contact and consequently slow the spread of COVID-19. Isolation ensures that persons known or suspected to be infected with the virus stay away from all healthy individuals. Isolating contagious, or potentially contagious, employees from their co-workers can prevent further spread at the workplace and safeguard the health of other employees. Quarantine is used to keep persons at risk of developing COVID-19 away from all other people until it can be determined whether the individual is infected following an exposure to someone with suspected or confirmed COVID-19 (Honein et al., 2020).

DRAFT

The first two categories of employees who should be removed from the workplace are those employees who are suspected to be or are confirmed COVID-19 positive based on a COVID-19 test or diagnosis by a healthcare provider and those employees who develop certain COVID-19 symptoms.[13] Removal of these two categories of employees is consistent with isolation guidance from the CDC (February 11, 2021). Employers also prevent further transmission of COVID-19 in the workplace by providing employees a place to isolate from other workers until they can go home if they arrive with, or develop, COVID-19 symptoms at work (CDC, February 16, 2021; CDC, March 8, 2021a). ACOEM (August 19, 2020) also recommends that symptomatic employees who could be ill stay home to protect healthy workers. Several studies have focused on the impact of isolating persons with COVID-19 from others during their likely known infectious period, and those studies show that isolation is a strategy that reduces the transmission of infections. For example, Kucharski et al. (2020) found that transmission of SARS-CoV-2 would decrease by 29% with self-isolation within the household, which would extend to 37% if the entire household quarantined. Similarly, Wells et al. (2021) found that isolation of individuals at symptom onset would decrease the reproductive rate (R0) of COVID-19 from an R0 of 2.5 to an R0 of 1.6. However, the study authors noted that when assuming low levels of asymptomatic transmission the R0 never fell below one, meaning there is a need for isolation to be used in concert with a more robust and layered infection control program as is required by other provisions in the ETS.

The third category of employees who should be removed from the workplace to further reduce disease transmission are those who are at risk of developing COVID-19 because they

[13] Evidence on the sensitivity and specificity of certain symptom triggers is discussed above. The *Summary and Explanation* section of this preamble includes more discussion of the symptoms that trigger removal from the workplace and the rationale for selection of those symptoms.

DRAFT

have had recent close contact in the workplace with someone who is COVID-19 positive, but the employee who was exposed has not yet developed symptoms or been confirmed positive (CDC, March 12, 2021). The need for removal of these employees is based on quarantine guidance from CDC (December 2, 2020) and is consistent with CDC recommendations for quarantine as a means of reducing workplace transmission (CDC, February 16, 2021). Such removal is important because infected individuals are capable of transmitting the virus before they start experiencing symptoms and are aware that they are ill, and many (estimated to be 17% in one analysis) may never experience symptoms at all (Byambasuren et al., 2020). Therefore, ensuring that exposed employees are removed from work until it is highly unlikely that they have developed COVID-19 is critical for preventing the transmission of infections by employees who could be unknowingly infected. CDC defines exposure through close contact as being within 6 feet of an infected person for a cumulative total of at least 15 minutes over a 24-hour period starting at 2 days before illness onset (or 2 days before samples are collected for testing in asymptomatic patients) and until the infected person meets the criteria for ending isolation (CDC, December 3, 2020a).

However, CDC does not recommend quarantine following close contact with someone who is suspected or confirmed to have COVID-19, if the person who had close contact meets all of the following criteria: (1) they have been fully vaccinated for COVID-19; (2) it has been at least 2 weeks since the full vaccination was completed; and (3) they do not develop any symptoms (CDC, March 8, 2021b; March 12, 2021). CDC also has analyzed accumulating evidence indicating that persons who have recovered from laboratory confirmed COVID-19 and remain symptom-free may not have to quarantine again if exposed within three months of the illness. CDC (February 13, 2021) concluded that although the evidence does not definitively

DRAFT

demonstrate the absence of reinfection within a three month period, the benefits of avoiding unnecessary quarantine likely outweigh the risks of reinfection as long as other precautions such as physical distancing, face coverings, and hygiene continue to be implemented.

CDC's recommendation was based on a review of more than 40 studies examining evidence of re-infection in recovered individuals (complete reference list included in CDC, February 13, 2021). While many studies demonstrated that reinfection can occur at least 90 days after infection (e.g., Colson et al., 2020; Van Elslande et al., 2021), other studies suggest re-infection is possible as early as 45 days after infection (e.g., Abu-Raddad et al., 2020; Larson et al., 2020; Tillet et. al., 2020). Although antibodies to the virus that causes COVID-19 have not been definitively correlated with protection from reinfection and it is not clear what level of antibodies would be required for protection, increasing numbers of studies are suggesting that the majority of recovered patients develop antibodies specific for the virus that causes COVID-19 (e.g., Deeks et al., 2020; Gudbjartsson et al., 2020). Antibody responses have been reported to last for six months or more in some studies (e.g., Choe et al., 2021; Dan et al., 2021), but other studies suggested lower levels of antibodies or detection of antibodies for shorter periods of time (e.g., Ibarrondo et al., 2020; Seow et al., 2020). In addition to the production of antibodies, immunity can be achieved through virus-specific T- and B-cells (e.g., Kaneko et al. 2020), and some studies show that T- and B-cell immunity can last for 6 months or more (e.g., Dan et al., 2021; Hartley et al., 2020). Some studies suggest that T- and B-cell responses could be higher in symptomatic versus asymptomatic adults (e.g., Zuo et al., 2021). Results from animal challenge studies (e.g., Chandrashekar et al., 2020; Deng et al., 2020), and seropositive adults in outbreak settings (Abu-Raddad et al., 2020; Lumley et al., 2021) provide additional evidence that initial infection might protect against reinfection.

DRAFT

In addition to the uncertainty noted above, CDC notes that risk of reinfection may be increased in the future, with the circulation of variants (e.g., CDC, February 13, 2021; Nonaka et al., 2021; Harrington et al., 2021; Zucman et al., 2021). Because of the uncertainty regarding reinfection and increased possibility of reinfection following exposure to variants, it is important that employees be removed from the workplace if they develop symptoms after close contact with someone who has COVID-19, even if the employee is fully vaccinated or was confirmed to have COVID-19 in the previous three months. In addition, that uncertainty highlights the need for the layered protections in the standard, such as physical distancing, face coverings, and hygiene.

Medical Removal Protection Benefits

Notification and removal will be most effective if the employees responsible for reporting do not face potential financial hardships for accurate reporting of symptoms and illnesses. As noted above, employers must know that an employee is suspected or confirmed to have COVID-19 or has certain symptoms of COVID-19 before they can remove those employees from the workplace. But removing employees from the workplace based on their own reports is likely to prove an effective control for COVID-19 only if the employees are not afraid they will be penalized for making those reports. OSHA's experience demonstrates that employees will self-report at a sufficient level to make removal program effective only when removed employees do not face a significant financial penalty – such as lost income during the removal period – and when employees may return to work after their removal period without any adverse action or deprivation of rights or benefits because of the removal. Because the employer will often have no other way to learn whether an employee is suspected or confirmed to have COVID-19, or has certain symptoms of COVID-19, medical removal protections are necessary to ensure that

DRAFT

employees are not disincentivized to report suspected or confirmed COVID-19 or symptoms of COVID-19. Because infectious employees pose a direct hazard to their co-workers, removing barriers to reporting symptoms or confirmed diagnoses protects not only the reporting employee but also every other employee who would otherwise be exposed to infection.

OSHA's experience shows that the threat of lost earnings, benefits, and/or seniority protection provides a significant disincentive for employees to participate in workplace medical screening and reporting programs (*see United Steelworkers of America v. Marshall*, 647 F.2d 1189, 1237 (D.C. Cir. 1981) (recognizing the importance of removing financial disincentives for workers exposed to lead)). In the lead rulemaking, OSHA adopted a medical removal protection benefits provision in part due to evidence that employees were using chelating agents to achieve a rapid, short-term reduction in blood lead levels because they were desperate to avoid economic loss, despite the possible hazard to their health from the use of chelating agents (43 FR 54354, 54446 (November, 21, 1978)). OSHA's standards for cotton dust and lead contain testimony from numerous employees indicating that workers would be reluctant to report symptoms and participate in medical surveillance if they fear economic consequences (43 FR at 54442-5443; 50 FR at 51154-51155). A major reason that OSHA included medical removal protection benefits in the formaldehyde standard is because the standard does not have a medical examination trigger, such as an action level, but instead relies on annual medical questionnaires and employee reports of signs and symptoms. Thus, the approach is completely dependent on employee cooperation (57 FR at 22293). Literature reviews have similarly reported that lack of compensation is one reason why employees might go into work while sick (Heymann et al., 2020; Kniffen et al., 2021). Based on this evidence, OSHA concludes that protection of benefits for removed employees is necessary to maximize employee reporting of suspected or confirmed COVID-19

DRAFT

and symptoms associated with COVID-19. This in turn maximizes protection for all employees at the workplace.

Return to Work

After employees have been removed from the workplace as required by this standard, the employer must ensure that they do not return to the workplace until there is no longer a risk of disease transmission. Scientific evidence is available to determine the appropriate duration of isolation for COVID-19, which can be used to determine the appropriate duration of removal from the workplace. As general guidance, CDC recommends isolating symptomatic people with COVID-19 for at least 10 to 20 days after symptom onset, dependent on factors such as the severity of infection and health of the immune system. In most cases, the CDC states that a person can end isolation when (i) 10 days have passed since symptom onset; (ii) fever has been resolved (without fever-reducing medications) for at least 24 hours; and (iii) other symptoms (except loss of taste and smell) have improved. In cases of severe illness, the decision to end isolation may require consultation with an infection control expert. For persons who are confirmed positive but never develop symptoms, CDC recommends ending isolation at 10 days after the first positive test (CDC, February 13, 2021). These recommendations are based on scientific evidence reviewed by CDC which suggest that levels of viral RNA in upper respiratory tract samples begin decreasing after the onset of symptoms (CDC, February 13, 2021; CDC, unpublished data, 2020, as cited in CDC, February 13, 2021; Midgley et al., 2020; Young et al., 2020; Zou et al., 2020; Wölfel et al., 2020; van Kampen et al., 2021). Levels of replication-competent viruses (i.e., viruses that are able to infect cells and produce more infectious viral particles) also decrease over time; with only two possible exceptions, no replication-competent virus was detected after 10 days of symptom onset in individuals with mild-to-moderate disease

DRAFT

(CDC, unpublished data, 2020, as cited in CDC, February 13, 2021; Wölfel et al., 2020; Arons et al., 2020; Bullard et al., 2020; Liu et al., 2020a; Lu et al., 2020; personal communication with Young et al., 2020, as cited in CDC, February 13, 2021; Korea CDC, May 19, 2020; Quicke et al., 2020). In a study of persons with severe disease (possibly complicated in some individuals by an immunocompromised status), the median duration of shedding infectious virus was 8 days after onset of symptoms, and the probability of shedding virus after 15 days was estimated at 5% or less (van Kampen et al., 2021). In severely immunocompromised patients, "sub-genomic virus RNA" or replication competent virus was detected beyond 20 days and as much as 143 days after a positive virus test (e.g., Avanzato et al., 2020; Choi et al., 2020). A large contact-tracing study found no evidence of infections in individuals who had contact with infectious individuals in a household or hospital when exposure occurred at least 6 days after illness onset (Cheng et al., 2020). Accordingly, these studies support the CDC's recommended isolation guidance (CDC, August 10, 2020; CDC, December 3, 2020b; CDC, February 18, 2021). However, as noted, CDC's recommendations for isolation are only broad guidance; the appropriate duration for any given individual may differ depending on factors such as disease severity or the health of the employee's immune system.

As a general rule, CDC does not recommend a testing strategy as a means for determining when to end isolation, with the possible exception of severely immunocompromised persons (CDC, February 13, 2021). This is because tests to detect viral genetic material may yield positive results well after a person is no longer infectious. With the exception of two individuals, studies have demonstrated that although some individuals were observed to persistently shed virus (for up to 12 weeks), replication-competent virus has not been recovered at three weeks past illness (Korea CDC, May 19, 2020; CDC, February 13, 2021; Li et al., 2020;

DRAFT

Xiao et al, 2020; Liu et al., 2020a; Quicke et al. 2020). In addition, a study of 285 persons with persistent virus shedding, including 126 who experienced recurrent symptoms, found no evidence that any of the 790 contacts were infected from exposures to the people with persistent virus shedding (Korea CDC, May 19, 2020; CDC, February 13, 2021).

On the other hand, testing conducted after onset of sensitive symptoms associated with COVID-19 can identify individuals who are not infected. Peak virus shedding has been reported to occur just before and as symptoms are developing (Beeching et al., 2020; He et al., 2020). Testing for COVID-19 soon after the onset of symptoms has been estimated to result in a low false negative rate of 10%, based on the reported Polymerase Chain Reaction test sensitivity (Grassley et al., 2020).

Return-to-work criteria for employees who are removed from the workplace because they are at risk of developing COVID-19 after exposure to someone with COVID-19 in the workplace, but have not yet developed symptoms or tested positive themselves, are linked to the CDC's quarantine guidance. Based on available scientific evidence, the CDC generally recommends a 14-day quarantine period for individuals who have been exposed to a confirmed case of COVID-19 and are therefore at risk of developing COVID-19 (CDC, December 2, 2020). The 14-day quarantine period is based on the conclusion that the upper bound of the incubation period (the period between the point of infection and symptom onset) for COVID-19 is 14 days, and that there is a possibility that an unknowingly infected person can transmit the disease if quarantine is discontinued before 14 days (CDC, December 2, 2020). The scientific community agrees that a 14-day quarantine period is ideal. Linton et al. (2020) recommended a quarantine period of at least 14 days, based on a mean incubation period of 5 days, with a range of 2–14 days, in patients from and outside of Wuhan, China. Lauer et al. (2020) concluded that the CDC

DRAFT

recommendation to monitor for symptoms for 14 days is supported by the evidence, including their study of patients outside the Hubei province that reported a mean incubation period of 5.1 days and symptom development within 11.5 days in 97.5% of those who develop symptoms.

Although a 14-day quarantine is ideal and generally recommended, the CDC has recognized that a shorter quarantine period may be less burdensome and result in increased compliance. Therefore, the CDC reviewed emerging scientific evidence to provide shorter quarantine options that employers can consider if allowed by local public health authorities (Oran and Topol, 2020; Johansson et al., 2020; Kucirka et al., 2020; Clifford et al., 2020; Quilty et al. 2021; Wells et al., 2021; Khader et al., 2020, as cited in CDC, December 2, 2020; Liu et al. 2020b; Ng et al. 2021; Grijalva et al., 2020). One of those options is testing for the virus at five days after exposure and ending quarantine at seven days after exposure if results are negative. Importantly, this option is only appropriate for individuals who do not develop symptoms over the quarantine period (as such individuals should instead be managed according to the CDC's isolation strategies). Based on the evidence reviewed, CDC concluded that ending quarantine after a negative test and seven days with no symptoms would result in a residual transmission risk of about 5%, with an upper limit of about 12% (CDC, December 2, 2020).

DRAFT

Conclusion

As demonstrated above, the best available evidence strongly supports OSHA's conclusion that implementation of a comprehensive medical management program which includes health screening; notifications of potential exposures; removing employees who are COVID-19 positive, suspected to be positive, have certain symptoms, or have been exposed to a person with COVID-19 from the workplace until there is no longer a risk of disease transmission; and protection of removed employees' compensation, rights, and benefits are

necessary measures to reduce incidence of COVID-19 exposure in the workplace. Because the virus that causes COVID-19 is spread through exposure to infected individuals or surfaces contaminated by infected individuals, quickly identifying and removing employees from the workplace who have developed, likely developed, or are at heightened risk of developing COVID-19 will allow employers to significantly reduce the spread of COVID-19 in the workplace. The prompt identification and removal of these employees can prevent transmission of the virus to others in the workplace. In addition, medical removal protection provisions that ensure compensation and protection of rights and benefits during removal will encourage employees to report diagnoses of suspected or confirmed-positive COVID-19 and symptoms. However, as noted above, some employees with COVID-19 will not have symptoms, and testing to allow employees to return to work after exposures to COVID-19 or experiencing symptoms associated with COVID-19 will likely result in some false negatives. Therefore, a medical management program should be complemented by other measures as part of a multi-layered strategy to minimize employee exposure to the grave danger of COVID-19.

DRAFT

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11. Vaccination

Vaccines are an important tool to reduce the transmission of COVID-19 in the workplace. A vaccine serves two critical functions: first, it can reduce the likelihood that a vaccinated person will develop COVID-19 after exposure to SARS-CoV-2; and second, it can lessen the symptoms and effects in cases where the vaccinated person does contract COVID-19 (CDC, November 24, 2020). Vaccination also serves an important role in reducing health disparities in employees of certain demographics, who may be especially vulnerable to severe health effects or death from COVID-19 (Dooling et al., January 1, 2021). Vaccines are not a standalone measure and serve as one of many layers of protection in a workplace COVID-19 infection-prevention program.

OSHA has long recognized the importance of vaccinating employees against preventable illnesses to which they may be exposed on the job. The Bloodborne Pathogens standard, for example, requires the hepatitis B vaccine be made available to any employees with occupational exposure to blood and other potentially infectious materials, in order to reduce the risk of

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hepatitis B infection and subsequent illness and death (56 FR 64004, 64152 (Dec. 6, 1991)). A number of professional health organizations have similarly long recognized the importance of vaccinating employees to prevent illness. This is particularly true in healthcare industries, where employees are more regularly at risk of occupational exposure to transmissible diseases. For example, the Advisory Committee on Immunization Practices (ACIP), which reviews evidence of risk and vaccine effectiveness, recommends vaccinating healthcare employees for numerous diseases, including influenza, another viral disease spread through droplet transmission (Shefer et al., November 25, 2011). Similarly, both HICPAC and the American Hospital Association have encouraged and endorsed vaccination programs or policies for healthcare workers. The CDC, the WHO, and the National Academies of Science, among others, have all acknowledged that broad vaccination of all people for COVID-19, in combination with other public health measures, is a critical tool that can be used to address the pandemic (CDC, December 3, 2020; WHO, January 8, 2021; NAS, 2020).

Any vaccines offered to employees must be proven to be safe and effective. Fortunately, over the course of the pandemic, there have been extensive efforts to develop COVID-19 vaccines. As discussed in greater detail in *Grave Danger* (Section IV of the preamble), there are presently three COVID-19 vaccines authorized for emergency use by the FDA in the United States: the Pfizer-BioNTech vaccine, the Moderna vaccine, and the Janssen Biotech, Inc. Johnson and Johnson vaccine, each recommended for use by ACIP in persons at least 16 years of age for the Pfizer-BioNTech vaccines or 18 years of age for the Moderna and Johnson and Johnson vaccines (Oliver et al., December 18, 2020; Oliver et al., January 1, 2021; FDA, December 11, 2020; FDA, December 18, 2020; FDA, February 26, 2021). In determining whether to grant emergency use authorization (EUA) for a new COVID-19 vaccine, the FDA

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considers the totality of scientific evidence available to determine if the vaccine is reasonably believed to be effective (i.e., an efficacy of at least 50%) in preventing serious or life-threatening disease and that the benefits of vaccine outweigh the risk (FDA, December 11, 2020; FDA, December 18, 2020; FDA, February 26, 2021). The product manufacturer must also demonstrate quality and consistency in manufacturing. Accordingly, any COVID-19 vaccine that receives an EUA from the FDA—including the Pfizer-BioNTech vaccine, Moderna vaccine, the Johnson and Johnson vaccine, and any future vaccine that receives such an authorization after the issuance of this ETS—has been shown to be sufficiently safe and effective.

All three vaccines that have been authorized to date, including the Pfizer-BioNTech, Moderna, and Johnson & Johnson (Janssen) vaccines, have been found to be highly effective for the appropriate ages (Oliver et al., December 18, 2020; Oliver et al., January 1, 2021; Polack et al., December 31, 2020; Moderna, December 17, 2020; Pfizer-BioNTech, December 10, 2020; FDA, February 26, 2021). The vaccines were also found to be effective in preventing disease that is severe or requires hospitalization. The evidence available at this time, however, does not yet establish that the vaccines are effective at preventing asymptomatic COVID-19 development. All three authorized vaccines have met the authorization standard for safety, with the majority of adverse effects observed to be mild or moderate in severity and transient, including: fatigue; headache; chills; muscle pain; joint pain; lymphadenopathy (swelling or enlargement of lymph nodes) on the same side as the injection; and injection site pain, redness, and swelling (CDC, December 13, 2020; CDC, December 20, 2020; CDC, January 6, 2021; Oliver et al., December 18, 2020; Oliver et al., January 1, 2021; Polack et al., December 31, 2020; Moderna, December 17, 2020; Pfizer-BioNTech, December 10, 2020; FDA, February 26, 2021).

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Further, OSHA believes the vaccine will be more effective at preventing the transmission of COVID-19 if more employees have access to it. Access can be increased by employers paying for all time and costs associated with receiving the vaccine (if any); a readily accessible vaccine will be an additional layer of protection in a workplace infection prevention program. OSHA has previously recognized the importance of employer payment for vaccine costs as facilitating the effective implementation of vaccines as a control. During the Bloodborne Pathogens rulemaking, in response to comments from several stakeholders including the National Institute for Occupational Safety and Health and various healthcare providers, OSHA incorporated a requirement for employers to provide vaccination at no cost after receiving comments that covering the costs of vaccination (if any) is important for ensuring successful vaccination programs (56 FR 64004, 64513 (December 6, 1991)). Additional explanation of the importance of removing cost barriers to safety measures is discussed in *Summary and Explanation* (Section VIII of the preamble).

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12. Training

The CDC has determined that training is a necessary component of a comprehensive control plan for COVID-19. The WHO has also determined that training is an important control strategy for COVID-19 (WHO, May 10, 2020). When providing guidance for businesses and employers, the CDC has said that employees need to be educated on steps they can take to protect themselves from potential COVID-19 exposures at work. Employers informing employees of the hazards to which employees may be exposed while working is a cornerstone of occupational health and safety (OSHA, 2017). Employees play a particularly important role in

reducing exposures because appropriate application of work practices and controls limit exposure levels. Employees therefore need to be informed of the grave danger of COVID-19, as well as the workplace measures included in their employers' COVID-19 plans because those measures are necessary to reduce risk and provide protection to employees. Employees must know what protective measures are being utilized and be trained in their use so that those measures can be effectively implemented.

Training has been shown to be an effective tool to reduce injury and illness (Burke et al., 2006), but training is even more critical when the workplace hazard includes the potential transmission of the potentially deadly SARS-CoV-2 virus from one employee to another: one improperly trained employee could increase risk for that employee and for all of that employee's contacts, including coworkers. Therefore, training is an essential component of a layered approach to minimizing the risk of contracting COVID-19 in the workplace.

Training and education provide employees and managers an increased understanding of existing safety and health programs. A thorough understanding of these programs is necessary so employees can more effectively contribute to their development and implementation. Training provides employers, managers, supervisors, and employees with the knowledge and skills needed to do their work safely and to avoid creating hazards that could place themselves or others at risk, as well as awareness and understanding of workplace hazards and how to identify, report, and control them. Specialized training can address unique hazards.

Because OSHA has long recognized the importance of training in ensuring employee safety and health, many OSHA standards require employers to train employees (e.g., the Bloodborne Pathogen Standard at 29 CFR 1910.1030(g)(2)). When required as a part of OSHA standards, such as is required by this ETS, training helps to ensure that employees are

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able to conduct work in a safe and healthful manner (OSHA, April 28, 2010). Training is essential to ensure that both employers and employees understand the sources of potential exposure to COVID-19 and control measures to reduce exposure to the hazard.

Employee comprehension is critical to ensuring that training is an effective control. If training information is not presented in a way that all employees understand, the training will not be effective. Employers must thus consider language, literacy, and social and cultural appropriateness when designing and implementing training programs for employees (O'Connor et al., 2014). Additionally, if employers do not offer training to employees in a convenient manner, employees may be less likely to participate in the training. Therefore, to be effective, training must be offered during scheduled work times and at no cost to the employee. This will ensure that all employees will have the time and financial resources to receive training. This is also consistent with other OSHA standards. For example, the Bloodborne Pathogen Standard requires training be provided at no cost and during working hours (1910.1030(g)(2)(i)) and in a manner employees understand (1910.1030(g)(2)(vi)).

Research dating back to the 1980s has found "overwhelming evidence" of the effectiveness of training programs on employee knowledge (NIOSH, 1998), as well as employee behaviors (NIOSH, January 2010). With enhanced knowledge of safety and health hazards and controls, employees can implement safer work practices. This can result in reductions in orkplace-related illnesses (Burke et al., February 2006).

The CDC has stated that information on workplace policies should be communicated clearly, frequently, and via multiple messages (CDC, December 4, 2020). Training and education on safe work practices and controls should be used to raise awareness among employees. Emphasizing the effectiveness of these workplace controls helps to counteract misinformation.

DRAFT

Additional training, such as on PPE and infection control policies and procedures, should be given to employees in those workplaces where there is a high risk of exposure to COVID-19 (WHO, May 10, 2020).

Scientific research and case studies have further reinforced the importance of training in responding to the COVID-19 pandemic. Researchers found that a COVID-19 outbreak was effectively contained as a result of prompt implementation of infection control measures, including early in-person education of employees on the signs, symptoms, and transmission of COVID-19 (Hale and Dayot, August 13, 2020). Knowledge of PPE was markedly improved following training on PPE for healthcare employees in China during the COVID-19 pandemic (Tan et al., June, 2020).

Training has been widely recognized as a key component of occupational safety and health. Even though the body of scientific evidence on the importance of training during the COVID-19 pandemic is limited given its ongoing nature, the evidence that does exist only further emphasizes the important role of training in protecting the health and safety of employees. As such, OSHA has concluded that training is necessary to ensure proper implementation of the employer's COVID-19 plan and all other control measures, and that such training will reduce incidence of COVID-19 illness both on its own and when complemented by other measures as part of a multi-layered strategy to minimize employee exposure to the grave COVID-19 danger.

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13. Unique to Healthcare and Associated Industries

Certain aspects of COVID-19 in healthcare and associated industry settings require infection controls interventions specific to those workplaces. As noted in *Grave Danger* (Section IV of this preamble), several studies showed outbreaks, high percentages of infections, and high attack rates (number of individuals who are infected in comparison to the total number

DRAFT

at risk) for employees in healthcare and associated industries. Therefore, these settings need additional controls to ensure employee health and safety, including: patient screening and management; Standard and Transmission-Based Precautions/recognized good biosafety practices; personal protective equipment (PPE); and aerosol-generating procedures on persons with suspected or confirmed COVID-19.

*Patient screening and management*

Limited contact with potentially infectious persons is a cornerstone of COVID-19 pandemic management. For example, screening and triage of everyone entering a healthcare setting is an essential means of identifying those individuals who have symptoms that could indicate infection with the SARS-CoV-2 virus (CDC, February 10, 2021; CDC, February 23, 2021). Persons with such symptoms can then be triaged appropriately to minimize exposure risk to employees. CDC guidance provides a number of approaches for screening and triage, including screening at entry, separate triage areas for patients desiring evaluation for COVID-19 concerns, and electronic pre-screening prior to arrival (CDC, February 10, 2021; CDC, February 23, 2021). Once identified, potentially infected individuals can then be isolated for evaluation, testing and treatment. This triage increases the likelihood of implementation of the appropriate level of personal protective equipment for employees and other protections required for exposure to potentially infectious patients. Patient segregation in healthcare settings also reduces nosocomial (healthcare-acquired) infections for employees. Inpatients continue to require regular re-evaluation for COVID-19 symptoms.[14]

DRAFT

[14] Limiting and monitoring points of entry to the setting will also help limit contact with potentially infectious persons. For further discussion, see the *Need for Specific Provisions* for Physical Distancing.

Symptoms-based screening is a standard component of infection control. This approach was recommended during the 2003 SARS epidemic (caused by SARS-CoV-1, a different strain of SARS) and is routinely recommended for airborne infections such as M. tuberculosis and measles, and as a general practice in infection control programs (Siegel et al., 2007). Because SARS-CoV-2 can be transmitted by individuals who are infected but do not have symptoms (asymptomatic and presymptomatic transmission), symptom-based screening will not identify all infectious individuals (Viswanathan et al., September 15, 2020). Asymptomatic and presymptomatic transmission in the COVID-19 pandemic makes the multiple layers of protection required by the ETS critical for workers. However, persons with symptoms early in their SARS-CoV-2 infection are among the most infectious (Cevik et al., November 19, 2020). Therefore, symptom-based screening will identify some of the highest risk individuals for SARS-CoV-2 transmission and thereby reduce the risk to workers.

*Standard and Transmission-Based Precautions/ Recognized Good Biosafety Practices*

Standard and transmission-based precautions are well-accepted as important to controlling disease transmission (HICPAC, December 27, 2018; CDC, January 7, 2021). Additionally, recognized good biosafety practices need to be properly implemented to protect workers in biomedical laboratories. It should be noted that during times of significant transmission, such as during this pandemic, additional protections are needed and supplement the basic level of recommended precautions and practices in these guidelines. For instance, wearing at least a facemask regardless of interaction with known or suspected infectious patients is needed during the pandemic (CDC, February 10, 2021; CDC, February 23, 2021).

Standard Precautions refers to infection prevention practices, implemented in healthcare and associated industry settings, where the presence of an infectious agent is assumed (i.e.,

DRAFT

without the suspicion or confirmation of exposure). The use of Standard Precautions thus relies on the assumption that all patients, patient samples, potentially contaminated materials (e.g., patient laundry, medical waste), and human remains in healthcare and other applicable settings (e.g., mortuaries, medical waste facilities, medical equipment reprocessing facilities, laundries) are potentially infected or colonized with an infectious agent(s). For example, Standard Precautions would include appropriate hand hygiene and some use of personal protective equipment as well as practices to ensure respiratory hygiene, sharps safety, safe injection practices, and sterilization and disinfection of equipment and surfaces (CDC, February 10, 2021; CDC, February 23, 2021).

Transmission-Based Precautions add an additional layer of protection to Standard Precautions. Transmission-Based Precautions refers to those good infection control practices, used in tandem with Standard Precautions that are based on the way an infectious agent(s) may be transmitted. These precautions are needed, for example, when treating a patient where it is suspected or confirmed that the patient may be infected or colonized with agents that are infectious through specific routes of exposure (Siegel et al., 2007). For example, hand washing and safe handling of sharps (needles, etc.) are routine standard precautions. An infectious agent capable of airborne transmission through aerosols would require patient care in an airborne infection isolation room (AIIR), if available, under Transmission-Based Precautions.

The critical need for implementing Standard and Transmission-Based Precautions in healthcare and associated settings is evident in the Healthcare Infection Control Practices Advisory Committee's (HICPAC's) 2017 Core Infection Prevention and Control Practices for

DRAFT

Safe Healthcare Delivery in All Settings.[15] The core practices included in that document include Standard and Transmission-Based Precautions, which, HICPAC recommended, need to be implemented in all settings where healthcare is delivered.

That Standard and Transmission-Based Precautions are a long standing and essential element of infection control in healthcare and related industries is also evidenced by the CDC's 2007 Guideline for Isolation Precautions: Preventing Transmission of Infectious Agents in Healthcare Settings, which incorporate Standard and Transmission-Based Precautions into their recommendations. This 2007 Guideline updated 1996 guidelines, which introduced the concept of Standard Precautions and also noted the existence of infection control recommendations dating back to 1970 (Siegel et al., 2007).

Both Standard and Transmission-Based Precautions are recommended by the CDC for healthcare personnel during the COVID-19 pandemic (CDC, February 10, 2021; CDC, February 23, 2021). The CDC considers healthcare personnel (HCP) to include all paid and unpaid persons serving in healthcare settings who have the potential for direct or indirect exposure to patients or infectious materials, including body substances (e.g., blood, tissue, and specific body fluids); contaminated medical supplies, devices, and equipment; contaminated environmental surfaces; or contaminated air. HCP include, but are not limited to, emergency medical service personnel, nurses, nursing assistants, home healthcare personnel, physicians, technicians, therapists, phlebotomists, pharmacists, students and trainees, contractual staff not employed by the

DRAFT

[15] HICPAC is a federal advisory committee that provides guidance to the CDC and the Secretary of the Department of Health and Human Services (HHS) regarding the practice of infection control. In March 2013, CDC charged HICPAC with a review of existing CDC guidelines to identify all recommendations that warrant inclusion as core practices. In response, a HICPAC workgroup was formed that contained representatives from the following stakeholder organizations: America's Essential Hospitals, the Association for Professionals in Infection Control and Epidemiology (APIC), the Council of State and Territorial Epidemiologists (CSTE), the Public Health Agency of Canada (PHAC), the Society for Healthcare Epidemiology of America (SHEA), and the Society of Hospital Medicine (SHM) (HICPAC, March 15, 2017). This process resulted in HICPAC's Core Infection Prevention and Control Practices for Safe Healthcare Delivery in All Settings.

healthcare facility, and persons not directly involved in patient care, but who could be exposed to infectious agents that can be transmitted in the healthcare setting (e.g., clerical, dietary, environmental services, laundry, security, engineering and facilities management, administrative, billing, and volunteer personnel).

The CDC also has recommendations for protection of workers in industries associated with healthcare. For example, Standard Precautions are to be followed during embalming, which include the use of additional PPE if splashing is expected (CDC, November 10, 2020). Standard precautions with additional Transmission-Based precautions for aerosol generating procedures are also recommended for postmortem specimen collection (CDC, December 2, 2020). According to the CDC's *Interim Infection Prevention and Control Recommendations for Healthcare Personnel During the Coronavirus Disease 2019 (COVID-19) Pandemic*, management of laundry, food service utensils, and medical waste should also be performed in accordance with routine procedures (CDC, February 10, 2021; CDC, February 23, 2021). The WHO also has also issued guidelines for SARS-CoV-2 infection control in healthcare and associated industries (e.g., death care) (WHO, September 4, 2020; WHO, June 29, 2020).

Recognized good biosafety practices in settings where biomedical laboratory operations are conducted are also well established and essential aspects of infection control. A fundamental objective of any biosafety program is the containment of potentially harmful biological agents. The most important element of containment is strict adherence to standard microbiological practices and techniques. For example, a CDC panel recommends such standard biosafety precautions as the performance of appropriate hand hygiene, restrictions on eating, drinking and smoking, prohibitions against mouth pipetting, policies for the safe handling of sharps, and minimization of aerosol-generating events (Miller et al., January 6, 2012). Standard laboratory

DRAFT

practices are not sufficient to control the hazards associated with certain agents or laboratory procedures. In these circumstances, special practices are needed for handling an infectious agent(s) in accordance with the specified biosafety level (BSL) for that specific infectious agent(s). Increasing BSL levels involves more worker training, higher levels of containment of samples and other sources of pathogens, specially-designed air handling systems, additional worker PPE, and other stricter controls. While the guidelines recommend standard practices only at BSL-1, special practices are recommended for BSL-2 through BSL-4 (WHO, 2004). The CDC has issued FAQs for biosafety in laboratory settings during the COVID-19 pandemic (CDC, January 26, 2020). The FAQs recommend that, while working with specimens suspected or confirmed with COVID-19, laboratories perform a site-specific and activity-specific protocol-driven risk assessment to identify and mitigate risks and determine if enhanced biosafety precautions are warranted based on situational needs, such as high testing volumes and the likelihood of generating infectious droplets and aerosols (CDC, February 25, 2021). The FAQs also point the public to additional information contained in the World Health Organization's *Interim Laboratory biosafety guidance related to the coronavirus disease (COVID-19)* (WHO, January 28, 2021). Those guidelines provide that, although respiratory protection is generally not a part of the core requirements, in this particular context, a local risk assessment should be conducted to determine whether the use of respiratory protection is needed, especially when procedures that may create aerosols and droplets will be performed outside a biological safety cabinet, for example, centrifugation, handling leaking samples and procedures that can cause splashes (e.g. loading and unloading of sealed centrifuge cups, grinding, blending, vigorous shaking or mixing, sonic disruption, opening of containers of infectious materials whose internal pressure may be different from the ambient pressure).

DRAFT

The work of the College of American Pathologists (CAP) illustrates the importance of taking core precautionary measures in healthcare and associated industries during the pandemic. CAP has provided recommendations for staff protection during the COVID-19 pandemic. For example, CAP has provided COVID-19 specific recommended precautions for cytopathology staff who evaluate fresh biological specimens, such as specimens resulting from bronchoscopy (College of American Pathologists, January 29, 2021). As another example, CAP has provided COVID-19 specific autopsy recommendations which include biosafety considerations such as performing autopsies on COVID-19 positive cases in an airborne infection isolation room (College of American Pathologists, February 2, 2020).[16]

*Personal Protective Equipment*

This section focuses on the use of facemasks and face shields. Facemasks are the baseline requirement in healthcare settings because of the potential for splashes, splatters, and sprays of body fluids (e.g. blood) that are not reasonably expected to be present in non-healthcare settings. Facemasks are designed and regulated through various FDA processes to protect the person wearing them from potentially infectious splashes and droplets (e.g., respiratory secretions during medical procedures or blood). However, respirator use is also included in the healthcare and related industries section of the emergency temporary standard (29 CFR 1910.502). More information on the use of respirators during the pandemic is in the *Need for Specific Provisions* for Respirators analysis.

DRAFT

[16] CAP is known for its peer-based Laboratory Accreditation Program. The Centers for Medicare and Medicaid Services (CMS) allows a CAP inspection in lieu of a CMS inspection. CAP inspections have a similar status with a number of other leading healthcare and biomedical laboratory authorities including the Joint Commission, United Network for Organ Sharing, the National Marrow Donor Program, the Foundation for the Accreditation of Cellular Therapies, and many state agencies (College of American Pathologists, February 1, 2021). CAP has worked with the CMS to implement virtual laboratory inspections allowing labs to remain in compliance with Clinical Laboratory Improvement Amendments regulations (College of American Pathologists, February 1, 2021a).

Facemasks are a key aspect of infection control for infectious agents that are transmitted by the respiratory route. OSHA considers a facemask to be an FDA-cleared or authorized surgical, medical procedure, dental, or isolation mask. Facemasks function as a barrier to protect employees from hazards such as splashes or large droplets of blood or bodily fluids (Siegel et al., 2007).

Facemasks are loose-fitting, disposable devices that create a physical barrier between the mouth and nose of the wearer and contaminants in the immediate environment. Facemasks reduce the amount of infectious droplets that reach the wearer's mouth and nose. They are also used as source control (by patients, workers, visitors, and others). Facemasks provide added protection for sprays of infectious materials such as blood or bodily fluids. Facemasks have routinely been used in the operating room to prevent provider saliva and respiratory secretions from contaminating the surgical field and infecting patients. However, facemasks do not filter out very small airborne particles and do not provide complete protection even from larger materials since the mask seal is not tight (FDA, December 7, 2020).

Not all devices that resemble facemasks are FDA-cleared or authorized. To receive FDA clearance, manufacturers are required to submit an FDA premarket notification (also known as a 510(k) notification) for new products. Data in the 510(k) submission must show that the facemask is substantially equivalent to a facemask already on the market in terms of safety and effectiveness. Facemasks are tested for fluid resistance, filtration efficiency (particulate filtration efficiency and bacterial filtration efficiency), differential pressure, flammability and biocompatibility (FDA, July 14, 2004).[17]

DRAFT

[17] Medical devices are subject to premarket review through risk-based classification under the Federal Food, Drug, and Cosmetic Act. Premarket approval (PMA) applies to the highest-risk, Class III devices, and 510(k) notification applies to most Class II and some Class I devices. Under the 510(k) notification pathway, FDA determines whether

The protective effect of facemasks for workers in healthcare and associated industries is demonstrated by two studies conducted in connection with the 2003 SARS epidemic. First, in a study of 32 nurses who entered critical care unit rooms of infected patients (eight of whom developed SARS infections), it was found that infection risk was 77% less for those who consistently wore a surgical mask or N95 respirator (Loeb et al., February, 2004). The study was not powerful enough to precisely note the impact of only wearing a surgical mask, but the authors noted that consistent use of one could reduce infection risk by approximately 50 %.

Second, in a study of 254 staff in five Hong Kong hospitals with documented exposures to SARS patients, only two of the 13 staff who became infected reported wearing masks (noted to be "paper masks") (Seto et al., May 1, 2003). In contrast, none of the 51 workers who wore surgical masks became infected. This difference was statistically significant. The risk of becoming infected was 13 times higher in those who did not wear any respiratory protection (paper or surgical masks or N95 respirators) compared to those who did (95% CI (3, 60)).

Research from the current SARS-CoV-2 pandemic also provides evidence of the protection afforded by facemasks. First, a universal surgical masking requirement for all healthcare workers and patients was implemented in Spring 2020 in the Mass General Brigham health care system, which is the largest in Massachusetts (Wang et al., July 14, 2020). Based on daily infection rates among healthcare workers, the authors found that universal masking was associated with a significantly lower rate of SARS-CoV-2 positivity. Although the authors noted that other interventions, such as restricting visitors, were also put in place, they concluded that

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the device is substantially equivalent to a lawfully marketed predicate device. Medical device manufacturers are required to submit a 510(k) notification if they intend to introduce a device into commercial distribution for the first time or reintroduce a device that will be significantly changed or modified to the extent that its safety or effectiveness could be affected. Such change or modification could relate to the design, material, chemical composition, energy source, manufacturing process, or intended use. For more information, see https://www.fda.gov/medical-devices/device-advice-comprehensive-regulatory-assistance/how-study-and-market-your-device and https://www.fda.gov/medical-devices/device-approvals-denials-and-clearances/510k-clearances.

their results supported universal masking as part of a multi-pronged infection reduction strategy in health care settings.

Second, a systematic review and meta-analysis evaluated research on healthcare workers exposed to SARS-Cov-2, as well as the SARS and Middle East respiratory syndrome (MERS) viruses (Chu et al., June 1, 2020). Six studies compared the odds of infection in those who wore surgical or similar facemasks compared to those who did not wear any facemask; four of six were in healthcare workers and all six were from the 2003 SARS epidemic. Participants who wore surgical or similar facemasks had only a third of the infection risk of those who did not wear any facemask.

Third, a review of respiratory protection for healthcare workers during pandemics noted that surgical mask material has been shown to protect against more than 95% of viral aerosols under laboratory conditions (Garcia-Godoy et al., May 5, 2020). The authors also reviewed research showing that surgical masks reduced aerosolized influenza exposure by an average of six-fold, depending on mask design.[18]

A number of studies suggest that facemasks provide better protection than face coverings for workers in healthcare and associated industries because facemasks function as a barrier to protect employees from hazards such as splashes or large droplets of blood or bodily fluids. The first randomized trial of cloth face coverings compared rates of clinical respiratory illness, influenza-like illness and laboratory confirmed respiratory virus infections in 1,607 healthcare workers in 14 hospitals in Vietnam (MacIntyre et al., March 26, 2015). Infection risks were statistically higher in the cloth face covering group compared to the facemask group: the risk of influenza-like illness was 6.6 times higher, and the risk of laboratory-confirmed respiratory virus

[18] For a discussion of the efficacy of respirators over facemasks for protection against aerosolized particles, please see the respirator discussion in the *Need for Specific Provisions* section.

DRAFT

infection was 1.7 times higher, in those who wore cloth face coverings compared to those who wore facemasks. Furthermore, a review of respiratory protection for healthcare workers during pandemics showed greater protection from surgical masks compared to face coverings (Garcia-Godoy et al., May 5, 2020). Given the health outcomes related to COVID-19 and the exposure characteristics found in healthcare and associated industry settings (e.g., splashes or large droplets of blood or bodily fluids), cloth face coverings are not appropriate for workers in these settings.

Thus, research clearly indicates that facemasks are essential personal protective equipment for workers in healthcare and associated industries. OSHA has previously established that facemasks are essential PPE under both the PPE standard (29 CFR 1910.132) and more specifically, the Bloodborne Pathogens standard (29 CFR 1910.1030). More details are included in *Need for Specific Provisions* for Face Coverings, Facemasks and Face Shields.

Face shields are also routinely used to protect the mucous membranes of the eyes, nose and mouth during procedures and activities that could generate splashes or sprays of blood, body fluids, secretions and excretions. Face shields may also be used in combination with facemasks to protect employees from liquid infectious materials. The FDA has issued an emergency use authorization for face shields during the COVID-19 pandemic (FDA, April 13, 2020). More information on the use of face shields during the pandemic is the *Needs for Specific Provisions* for Face Coverings and Facemasks analysis.

Gloves are the most common type of personal protective equipment used in healthcare and associated industries. A major principle of Standard Precautions is that all blood and body fluids, whether from a patient, patient sample, or infectious material, may contain transmissible infectious agents (Siegel et al., 2007). Therefore, gloves are required for certain examinations

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and all procedures. These include everything from venipuncture to removing medical waste to intubation. Similarly, gowns are necessary for any activities in which splashes or clothing contamination is possible. This applies as part of Standard Precautions as well as for care of patients on Contact Precautions where unintentional contact with contaminated environmental surfaces must be avoided (Siegel et al., 2007).

Goggles (or face shields, as discussed above) may be used with facemasks to protect mucous membranes (eyes, nose and mouth) in situations where, for example, sprays of blood or body fluids are possible. CDC recommends that healthcare workers wear eye protection during patient care encounters to ensure eyes are protected from infectious bodily fluids (CDC, February 23, 2021).

*Aerosol-generating procedures on persons with suspected or confirmed COVID-19*

As explained in more detail in *Grave Danger* (Section IV of the preamble), aerosol-generating procedures are well known to be high risk activities for exposure to respiratory infections. Workers in a wide range of settings, such as emergency responders, healthcare providers, lab technicians, and mortuary workers, are at risk during aerosol-generating procedures. For the purposes of the ETS, only the following procedures are considered aerosol generating procedures: open suctioning of airways, sputum induction, cardiopulmonary resuscitation, endotracheal intubation and extubation, non-invasive ventilation (e.g., BiPAP, CPAP), bronchoscopy, manual ventilation, medical/surgical/postmortem procedures using oscillating bone saws, and dental procedures involving ultrasonic scalers, high-speed dental handpieces, air/water syringes, air polishing, and air abrasion. For further information on why these procedures are considered AGPs under the ETS, please see the discussion of aerosol-generating procedures in Section VIII, Summary and Explanation.

DRAFT

The CDC provides extensive guidance for performance of aerosol-generating procedures (CDC, February 23, 2021). First, exposure should be limited where possible. The CDC recommends that the use of procedures or techniques that might produce infectious aerosols should be minimized when feasible, as should the number of people in the room.

CAP has also recognized the risks involved in conducting aerosol generation procedures by recommending limiting the use of aerosol generating tools, such as oscillating bone saws, during autopsies on COVID-19 positive cases (College of American Pathologists, February 2, 2020). Post-mortem procedures using oscillating bone saws have specifically been noted as a COVID-19 related exposure concern (Nolte et al., December 14, 2020). The following controls are therefore recommended for autopsies involving the use of oscillating bone saws: isolation rooms, limiting the number of people in the room who are exposed, negative pressure ventilation, adequate air exchange, double door access, and use of respirators.

As noted in *Grave Danger* (Section IV of the preamble), it is well-accepted that COVID-19 may spread through airborne transmission during aerosol generating procedures. Therefore, where these procedures must be performed, there are two important controls for these situations; ventilation (for example, in the form of air infection isolation rooms (AIIR), if available) and respiratory protection. Both of these controls are required for aerosol generating procedures in the healthcare section of the ETS (29 CFR 1910.502). For more information on the use of respirators during aerosol generating procedures, please see *Needs for Specific Provisions* (Section V of this preamble) on Respirators.

It is well established that insufficient ventilation increases the risk of airborne disease transmission; indeed, this is the foundation for the World Health Organization recommendations on ventilation in healthcare settings (Atkinson et al., 2009). When air is stagnant or poorly

DRAFT

ventilated, aerosols may increase in concentration and increase exposure. Both a lack of ventilation and inadequate ventilation are associated with increased infection rates of airborne diseases. Increasing ventilation rates has been shown to decrease transmission risk of airborne disease. Ventilation is able to direct airflow away from uninfected individuals, which reduces risk of transmission.

The American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) is the authoritative organization for ventilation standards in the US. The U.S. Army Corps of Engineers (USACE) has been tasked by the US Federal Emergency Management Agency with the design and construction of alternative care sites during surges in the COVID-19 pandemic. USACE requested that ASHRAE provide engineering guidance for ventilation within alternative care sites. The resulting joint ASHRAE/USACE document makes recommendations for removal of aerosols generated by patients during AGPs and other patient care activities in alternative care sites (ASHRAE and USACE. November 20, 2020). Additionally, ASHRAE provides specific guidance on source control and AIIRs related to aerosol-generating procedures during the COVID-19 pandemic (ASHRAE, January 30, 2021).

Airborne infection isolation rooms (AIIR) are specifically designed to control the spread of aerosols and prevent airborne transmission of disease (Sehulster and Chinn, June 6, 2003). An AIIR has negative pressure in comparison to accessible areas outside the room, which causes air to flow into (rather than out of) the room from the room's access points when they are open (e.g., an open door). When the access points (e.g., the door) are closed and ventilation is adequate, contaminated air cannot escape at all into the rest of the facility. Air exhaust can be delivered directly outdoors or passed through a special high efficiency (HEPA) filter. In this way, AIIRs minimize potentially contaminated air flow outward into the rest of the facility.

DRAFT

Because of the risk of airborne transmission, the CDC recommends the use of AIIRs when aerosol generating procedures are performed on patients with suspected or confirmed COVID-19. However, increased protection for workers performing aerosol-generating procedures is not a new recommendation solely for the COVID-19 pandemic. The CDC and WHO both routinely recommend higher levels of personal protective equipment for workers performing these procedures on patients with other respiratory infections (CDC, October 30, 2018). The CDC recommendations for aerosol-generating procedures performed on influenza patients specify use of AIIRs when feasible. The recommendations also specify that the use of portable HEPA filtration units to further reduce the concentration of contaminants in the air should be considered. Similarly, the World Health Organization recommends more protective respirators for aerosol-generating procedures (WHO, April, 2008). Finally, the National Institute for Occupational Safety and Health (NIOSH) has developed a ventilated headboard that can be used to reduce employee exposure to patient-generated aerosols containing respiratory pathogens (NIOSH, May 26, 2020).

*Conclusion for Need for Specific Provisions Unique to Healthcare and Associated Industries*

As shown above and in the *Need for Specific Provisions* for Respirators analysis, the best available evidence strongly supports OSHA's conclusion that healthcare and associated industry employees need several interventions specific to settings where healthcare services and healthcare support services are provided, contaminated materials and human remains are handled, and biomedical laboratory operations are conducted. The implementation of patient screening and management reduces opportunities for contact with potentially infectious persons.

The implementation of Standard and Transmission-Based Precautions/Recognized Good Biosafety Practices is in accord with an established and effective infection control model for the

DRAFT

protection of workers in healthcare and associated industries. Providing and ensuring the use of the personal protective equipment required by the healthcare section of the ETS is necessary and appropriate given the health outcomes related to COVID-19 and the exposure characteristics found in healthcare and associated industry settings. Finally, the need for respirators, adequate ventilation (including AIIRs), and limitation of exposure during aerosol-generating procedures is well-established. A COVID-19 plan that includes these controls in a multi-layered strategy is essential to minimizing the risks of employee exposure to the grave COVID-19 danger.

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## VI. Feasibility

### A. Technological Feasibility

This section presents an overview of the technological feasibility assessment for OSHA's Emergency Temporary Standard (ETS) for COVID-19. The ETS has five sections: General (29 CFR 1910.501); Healthcare (29 CFR 1910.502); Mini Respiratory Protection Program (29 CFR 1910.504); Severability (29 CFR 1910.505); and Incorporation by Reference (29 CFR 1910.506). The general section applies to all employers and places of employment except places of employment covered by the healthcare section (and two other limited exceptions), and the healthcare section applies only to the places of employment of healthcare workers and workers in related industries (e.g., biomedical laboratories, funeral homes, laundries that handle contaminated materials from healthcare settings, medical waste facilities, medical reprocessing facilities). The mini respiratory protection program section supplements the general and healthcare sections to provide additional protection to workers in appropriate cases. These three sections of the ETS will be discussed below. It is not necessary to discuss the severability or incorporation by reference sections, as those sections do not by their own terms impose any requirements that raise issues of technological feasibility.

Technological feasibility has been interpreted broadly to mean "capable of being done" (*Am. Textile Mfrs. Inst. v. Donovan*, 452 U.S. 490, 509-510 (1981)). A standard is technologically feasible if the protective measures it requires already exist, can be brought into existence with available technology, or can be created with technology that can reasonably be

DRAFT

expected to be developed, i.e., technology that "looms on today's horizon" (*United Steelworkers of Am., AFL-CIO-CLC v. Marshall*, 647 F.2d 1189, 1272 (D.C. Cir. 1980) (*Lead I*); *Amer. Iron & Steel Inst. v. OSHA*, 939 F.2d 975, 980 (D.C. Cir. 1991) (*Lead II*); *American Iron and Steel Inst. v. OSHA*, 577 F.2d 825 (3rd Cir. 1978)). Courts have also interpreted technological feasibility to mean that a typical firm in each affected industry or application group will reasonably be able to implement the requirements of the standard in most operations most of the time (see *Public Citizen v. OSHA*, 557 F.3d 165 (3rd Cir. 2009); *Lead I*, 647 F.2d at 1272; *Lead II*, 939 F.2d at 990). OSHA's assessment focuses on the four controls required by the ETS that stakeholders may believe raise issues of technological feasibility: COVID-19 plans; physical distancing; physical barriers; and ventilation.[19] As discussed below, OSHA's finding of technological feasibility is supported by a large number of COVID-19 transmission prevention plans and best practice documents it reviewed, as well as physical distancing scenarios and a job matrix it developed, across industry sectors.

In analyzing the evidence, OSHA observed that groups of employees across a wide range of industry sectors have similar job roles, responsibilities, and tasks, and employers across these industry sectors therefore face similar challenges with respect to protecting employees from the COVID-19 hazard. To this end, as will be explained further, OSHA's assessment of the feasibility of implementing controls such as physical distancing and physical barriers for individual industry sectors applies equally to other sectors to the extent employees in different sectors have similar jobs or engage in similar work processes.

DRAFT

[19] As will be discussed later in this assessment, there are no technological feasibility barriers related to compliance with other requirements in the ETS (e.g., face coverings, facemasks, and respirators, cleaning and disinfection, health screening and medical management, employee notification).

While OSHA focuses on certain types of evidence in specific parts of the analysis, much of the evidence supports other discrete findings made by OSHA. Thus, for example, while OSHA focuses on its review of plans and best practice documents in establishing the feasibility of developing and implementing a COVID-19 plan, that evidence also supports the feasibility of implementing physical distancing and physical barriers.

In addition, this analysis discusses only a few examples of the plans and best practice documents it reviewed, does not recount every element of the plans and best practice documents that it reviewed, and does not recount all details of the scenarios and job matrix it developed. OSHA based its technological feasibility assessment on all the evidence in the docket, and not just the select portions discussed here. The discussion below is merely illustrative of the full complement of evidence reviewed to demonstrate that employers have implemented the controls required by the ETS across a wide variety of industries.

Finally, OSHA's finding of technological feasibility should not be read to indicate that individual plans or best practice documents OSHA reviewed are ETS-compliant, that lack of inclusion of a control in a plan or document indicates the control is infeasible, that the use of a barrier by employers in a given situation indicates that physical distancing was not feasible in that situation, or that a particular control used (e.g., a plastic sheet or curtain used as a physical barrier) is compliant with the ETS's requirements. The plans and best practice documents are intended to show two things: (1) that developing plans to address COVID-19 in various workplaces is both common and feasible in a wide variety of industries, and (2) that the controls required by the ETS have been implemented and are feasible. The specifics of the plans may vary, but the ETS COVID-19 plan requirements are written as performance requirements that

DRAFT

provide sufficient flexibility to ensure that it is feasible for employers to develop and implement such a plan, including appropriate controls, for any given workplace.

*The ETS's Approach to Employee Protection*

The ETS generally includes provisions that are based on and in accordance with applicable CDC and other well-established guidelines for good infection control practices and recognized good biosafety practices relevant to the exposures encountered by employees during their job tasks. For example, the healthcare section of the ETS requires that in settings where healthcare services, healthcare support services, or mortuary services are provided, the employer must develop and implement policies and procedures to adhere to Standard and Transmission-Based Precautions, and that in settings where biomedical laboratory operations are conducted, the employer must develop and implement policies and procedures to adhere to recognized good biosafety practices. As discussed in detail in the Need for Specific Provisions section of the Preamble, these requirements are consistent with well-established CDC and other guidelines that are routinely followed by employers subject to the healthcare section. As another example, the general section requires the use of face coverings or facemasks, which, the CDC recognizes, are effective in helping control spread of the virus that causes COVID-19 (CDC, February 16, 2021a). That the ETS is based on CDC and other guidelines or practices that are well established and have been routinely followed by many employers both before and during the pandemic is compelling evidence supporting OSHA's finding of technological feasibility.

Moreover, as described in more detail in the Need for Specific Provisions section of the Preamble, COVID-19 transmission control practices work best when used together, overlapping their protective impact. To this end, the COVID-19 ETS provides a multilayered approach in which a combination of control measures must be implemented to minimize the risks of exposure

DRAFT

to COVID-19. Thus, to effectively reduce the risk, employers must ensure that they follow all feasible requirements of the ETS and not just some of them. As discussed in the Need for Specific Provisions section, the OSHA regulatory text reflects a multilayered strategy by requiring employers to implement multiple mitigation strategies with several layers of controls to lower the risks of exposure and reduce the spread of disease. Utilizing overlapping controls in a layered approach better ensures that no inherent weakness in any one approach results in an infection incident. OSHA emphasizes that the infection control practices required by the ETS work best when used together, layering their protective impact (Garner et al.,, 1996; Rusnak et al., September 2004; CDC, 2012; WHO, 2016). For example, in addition to requiring employers to ensure that employees engage in physical distancing, wear face coverings, and follow healthy hand hygiene practices, employers must ensure the use of physical barriers at fixed work locations where physical distancing is not feasible and ensure adequate building ventilation. No one measure can prevent transmission by itself, but several layers combined can significantly reduce the overall risk of COVID-19 transmission (e.g., a face covering alone will not be enough to prevent the spread of COVID-19 without physical distancing and other controls (Akhtar et al., December 22, 2020)).

Implementing multiple mitigation strategies is even more necessary to reduce the risk, because it will not be feasible to apply every control in every workplace situation. Thus, the ETS employs strategies to ensure that employees will be protected even when a particular control is not feasible. As discussed below, OSHA concludes that this multilayered approach to employee protection is feasible based on its review of employer plans, best practice documents, scenarios, and a job matrix that show these precautions are already in place or can be readily implemented by typical firms in affected industry sectors.

DRAFT

OSHA emphasizes, finally, that although the ETS takes a multilayered approach to employee protection, it also establishes how and when controls must be used. For example, physical barriers are required only where physical distancing is not feasible because, as OSHA discusses in depth in *Need for Specific Provisions* (Section VI of the preamble), physical barriers work by preventing droplets from traveling from the source (i.e., an infected person) to an employee, and are particularly critical when physical distancing of 6 feet is not feasible because most COVID-19 transmission occurs via respiratory droplets that are spread from an infected individual during close (within 6 feet) person-to-person interactions.

*COVID-19 Plans (General and Healthcare Sections)*

Paragraph (c) of the general section and paragraph (c) of the healthcare section of the ETS requires the employer to develop and implement a COVID-19 plan that includes policies and procedures to minimize the risk of transmission of COVID-19, as reflected in paragraphs (d) through (k) of the general section and (d) through (n) in the healthcare section.

Table 1 summarizes these requirements.

**Table 1: Provisions in General and Healthcare ETS**

| Provision | General | Healthcare |
|---|---|---|
| Physical distancing | (d) | (h) |
| Physical barriers | (e) | (i) |
| Face coverings | (f) | -- |
| Cleaning and Disinfection | (g) | (j) |
| Ventilation | (h) | (k) |
| Health screening and medical management | (i) | (l) |
| Vaccination | (j) | (m) |
| Training | (k) | (n) |

DRAFT

| | | |
|---|---|---|
| Patient screening and management | -- | (d) |
| Standard and Transmission-Based Precautions | -- | (e) |
| Personal protective equipment (including facemasks and respirators) | -- | (f) |
| Aerosol-generating healthcare or postmortem procedures on a person with suspected or confirmed COVID-19 | -- | (g) |

OSHA conducted a search for existing COVID-19 plans and best practices developed by employers, trade associations, and other organizations and posted on their publicly available websites. OSHA's search revealed extensive development by employers across all affected industries of plans and best practice documents that address COVID-19 hazards using the multilayered approach and controls required by the ETS.

Specifically, OSHA found and reviewed 418 plans from employers representing 92 separate 3-digit North American Industry Classification System (NAICS) codes, and 286 best practice documents from trade associations and other organizations covering 46 3-digit NAICS codes (ERG, February 9, 2021). The number of plans and best practices OSHA reviewed are listed in Table 2 grouped by 2-digit NAICS code. A breakdown by 3-digit NAICS codes with the name of the company or organization, a description of the contents, and a link to the plan can be found at (ERG, February 9, 2021).

**Table 2: COVID-19 Plans and Best Practices by 2-Digit NAICS**

| 2-Digit NAICS | Industry | Companies | Trade Associations and Other Organizations |
|---|---|---|---|
| 11 | Agriculture, Forestry, Fishing and Hunting | 17 | 11 |

DRAFT

| | | | |
|---|---|---|---|
| 21 | Mining, Quarrying, and Oil and Gas Extraction | 12 | 8 |
| 22 | Utilities | 5 | 6 |
| 23 | Construction | 17 | 14 |
| 31-33 | Manufacturing | 88 | 16 |
| 42 | Wholesale Trade | 9 | 2 |
| 44-45 | Retail Trade | 62 | 5 |
| 48-49 | Transportation and Warehousing | 47 | 26 |
| 51 | Information | 19 | 12 |
| 52 | Finance and Insurance | 14 | 5 |
| 53 | Real Estate and Rental and Leasing | 8 | 2 |
| 54 | Professional, Scientific, and Technical Services | 6 | 8 |
| 55 | Management of Companies and Enterprises | 1 | 0 |
| 56 | Administrative and Support and Waste Management and Remediation Services | 12 | 21 |
| 61 | Educational Services | 12 | 34 |
| 62 | Health Care and Social Assistance | 24 | 53 |
| 71 | Arts, Entertainment, and Recreation | 16 | 15 |
| 72 | Accommodation and Food Services | 10 | 25 |
| 81 | Other Services (except Public Administration) | 29 | 12 |
| 99 | State & Local Government | 10 | 11 |
| Total | | 418 | 286 |

DRAFT

OSHA's review of existing plans and best practice documents found that almost all of the plans and best practices required maintaining physical distancing, use of face coverings, and cleaning and disinfection procedures, as well as the use of physical barriers where distancing was not feasible. All plans and best practices also emphasized the need for employee training. Ensuring adequate ventilation and upgrading filtration was mentioned in some plans and best practices, as were procedures for health screening and medical management and worker notification.

Based on its review, OSHA concludes that it is feasible for employers in typical firms in both healthcare and all other sectors to comply with the requirements in the ETS for a COVID-19 plan. Below, OSHA highlights the elements of a few of the plans and best practice documents it reviewed. In each case, OSHA presumes that an organization believes that the particular approaches contained in the organization's own documents are technologically feasible.

The National Association of Manufacturers (NAM), a trade organization that represents a broad spectrum of 14,000 employers that employ over 12.8 million people in the US, has developed best practices for minimizing the risk from COVID-19 for employees as well as customers. These best practices can be, and have been, used by NAM's member companies to develop their individual plans (NAM, May 2020). As NAM states in the best practices, "[t]he following is a collection of emerging strategies and new operational practices that many leading manufacturing organizations of all sizes are considering and/or implementing to guide their workplaces and employees safely through the pandemic." Many of the NAM best practices represent an overlapping controls strategy. For example, NAM states that companies are working to station employees at least six feet apart and one way that this has been achieved is by slowing

DRAFT

down production lines, and when physical distancing is not feasible, employers have installed physical barriers, such as plexiglass or vinyl, along with requiring face coverings. NAM also states that companies have taken a combination of approaches for cleaning and disinfection, such as cleaning work stations before and after each shift, disinfecting tools after each use, and performing a deeper cleaning of the entire work area either nightly or weekly. NAM also discusses health screening and medical management. According to NAM, some companies have implemented self-certification questionnaires to employees and/or visitors that are critical for ongoing operation before they can enter the site. For example, in these questionnaires, employees may certify that they have not displayed symptoms, been in recent contact with someone that has tested positive for COVID-19, or traveled to COVID-19 "hot spots." NAM also discusses caring for an employee who begins to feel ill at work, conducting contact tracing while protecting the employee's identity, and conducting facility-related protocols to protect other employees.

The National Restaurant Association, which represents more than 500,000 restaurant businesses and is the largest foodservice trade association in the world, also issued a set of best practices. Similar to the NAM best practices and other plans and best practice documents that were reviewed, these best practices overlap with many of the controls that are set forth in the ETS. Also similar to the NAM and other best practice documents, the National Restaurant Association membership can use this guidance to develop their individual plans. For example, the National Restaurant Association document promotes rearranging tables, using technology for contactless payment, moving to a reservation-only model, having separate entrance and exit points, posting signs and floor markers, limiting the number of employees that are in break rooms simultaneously, and other controls to maintain physical distance. While some of the

DRAFT

suggested practices to promote physical distancing are intended for customer protection, they may be applicable for employers' plans as well (i.e., to protect workers) (NRA, May 22, 2020).

The National Restaurant Association also recommends installing physical barriers at cash registers, bars, host stands, and other areas where physical distancing may not be feasible. In addition, the National Restaurant Association recommends the use of face coverings and increased cleaning and disinfection. While cleaning and disinfection is already common in the foodservices industry, the National Restaurant Association recommends increasing the frequency of cleaning and sanitizing of surfaces. It also recommends closing off areas where a potentially contagious person has been for 24 hours and then cleaning, sanitizing, and disinfecting the areas. The National Restaurant Association recommends ensuring that ventilation systems are working properly and increasing the circulation of outdoor air as much as possible. It states that pre-work screenings should be in place to identify employees with symptoms of COVID-19 or employees that have had an exposure to COVID-19, and employers should follow CDC guidance to determine when an employee can return to work. Finally, the National Restaurant Association states that employees should be safely trained on all of these best practices in a way that incorporates physical distancing and face coverings (NRA, May 22, 2020).

The General Building Contractors Association (GBCA) also issued a set of best practices. These best practices promote physical distancing by replacing in-person meetings with phone or online meetings, taking breaks in shifts, reducing the size of all-hands meetings, allowing non-essential personnel to work from home, adjusting shift schedules, discouraging hand shaking, and taking the stairs, instead of hoists or elevators, if the destination is five flights or less (GBCA, 2021). GBCA states that employers should provide employees with face coverings and direct them to wear them. GBCA also requires face coverings when working within 6 feet of

DRAFT

another employee. GBCA recommends installing hand washing stations for frequent hand washing, but states that hand sanitizer should be provided when hand washing facilities are not readily available. GBCA states that disinfection wipes should be available to wipe down surfaces, and employees performing cleaning should be issued the proper PPE. GBCA states that employees should follow CDC guidelines for protecting themselves, and that employees should not report to work if they are sick or experiencing symptoms of COVID-19. GBCA states that a Pandemic Safety Officer should be identified for implementing all recommended protocols. GBCA has a "COVID-19 Awareness Training & Certification" course available through their website for these Pandemic Safety Officers.

The Center to Protect Workers' Rights (CPWR), on behalf of the Center for Construction Research and Training and NIOSH National Occupational Research Agenda (NORA) Construction Sector Council's COVID-19 Work Group, conducted a survey of construction companies about their use of ventilation, leading the Work Group to develop guidance for the construction industry containing tips to increase ventilation at indoor construction sites without operating HVAC systems. The survey findings showed the COVID-19 related ventilation and exposure control challenges facing the construction industry and also that many construction employers are already implementing best practices to meet those challenges (CPWR, December 2020).

OSHA reviewed a company plan from the commercial construction industry (Shawmut Inc., 2021). This plan implements several strategies for physical distancing, such as limiting hoist/elevator occupancy, limiting gatherings to five people, traveling to work separately, minimizing crew sizes by staggering shifts, holding meetings outside, and limiting jobsite employees to only essential personnel. In addition, the plan states that physical barriers and

DRAFT

temporary partitions are required to define work zones, and that, when employees cannot maintain physical distance, a "close proximity work permit" must be completed and face coverings must be worn. The plan requires that all projects have access to hand washing stations that are at least 6 feet apart, and that when soap and water are not available, hand sanitizer is an acceptable alternative, and also requires that each project must establish formal procedures for increased cleaning and disinfection of common areas and other frequently touched surfaces. It also details the types of cleaners that should be used and the types of PPE that should be worn during this process. The plan also requires that all meetings and breaks are to be taken outside or in open-air space, and that screening and testing take place in a dedicated area prior to each shift. Screening, according to the plan, includes a self-certifying screening questionnaire that is filled out by scanning a project QR code with a smart phone outside of the project site. Finally, the plan provides for the workforce to be trained on protection from COVID-19 over several weeks, and for periodic toolbox talks to provide updates and ongoing education related to COVID-19.

OSHA has determined that developing a COVID-19 plan, as required by the ETS, is feasible based on the evidence that employers representing a wide range of NAICS codes have developed plans that address many of the requirements of the ETS. Additionally, many national trade associations, small business associations (SCORE, May 8, 2020), and other organizations, also representing a wide range of NAICS codes, have developed best practices to aid in the development of these plans (ERG, February 9, 2021). As discussed in the Summary and Explanation (section [VIII]), the plan must address the hazards identified per the hazard assessment required by paragraph (c)(4) of the ETS and do regular inspections to ensure ongoing effectiveness of the plan and update as needed.

*Physical Distancing and Physical Barriers (General and Healthcare sections)*

DRAFT

Physical Distancing: Paragraph (d) in the general section of the ETS and paragraph (h) in healthcare section of the ETS require the employer to ensure that each employee is separated from all other people by at least 6 feet unless the employer can demonstrate that such physical distancing is not feasible for a specific activity, and that, when the employer establishes it is not feasible for an employee to maintain a distance of at least 6 feet from all other people, the employer must ensure that the employee is as far apart from all other people as feasible.

Physical Barriers: Paragraph (e) of the general section of the ETS requires that at each fixed work location where an employee is not separated from all other people by at least 6 feet of distance, the employer must install cleanable solid barriers, except where the employer can demonstrate it is not feasible. Paragraph (i) of the healthcare section of the ETS has a similar requirement for non-patient care areas.

*Physical distancing scenarios*

*Introduction*

OSHA developed 23 "physical distancing" scenarios for a variety of workplaces covering a wide range of situations to describe the controls that have been put in place to maintain not only physical distancing but also physical barriers, as well as other controls required by the ETS as part of a multilayered strategy to reduce or eliminate the transmission of SARS-CoV-2. As OSHA discusses in more depth below, these scenarios are based primarily on COVID-19 plans developed by employers across affected industries.

OSHA uses these scenarios (and by extension the plans on which they are based) to support its feasibility determination regarding the physical distancing and physical barrier requirements of the ETS, and also to show that other controls required by the ETS are being or can be implemented by typical employers across affected industries.

DRAFT

OSHA also uses these scenarios to explore ways to mitigate the remaining risk of exposure when it is infeasible to comply with the requirements for physical distancing. While this portion of the analysis falls outside the pure examination of the technological feasibility of the required controls, it is intended to demonstrate the steps that employers are expected to take to reduce exposure risk. Some of the plans that OSHA consulted in developing these scenarios include examples of controls that would not meet the requirements of the ETS, but OSHA has attempted to incorporate some of these examples into the scenarios while noting that some of the controls may only be used when the other controls are infeasible.

Thus, for example, some scenarios describe the use of both physical distancing and physical barriers by employers, while other scenarios describe the use of face shields by employers as a means of source control. OSHA's description of the scenarios below should not be read to mean that OSHA sanctions the use of physical barriers in lieu of physical distancing, when physical distancing is feasible, or that the use of face shields provides source control protection that is in lieu of facemasks or face coverings. For an in depth discussion on the rationale underlying OSHA's rulemaking decisions, please see *Need for Specific Provisions* (Section 5 of the preamble).

As another example, some scenarios describe face coverings or facemasks, ventilation, and other controls required by the ETS as additional controls when physical distancing is not feasible. But these controls are not alternatives to physical distancing under the ETS. Again, physical distancing (or physical barriers, when physical distancing is not feasible) must be implemented alongside these controls under the ETS as part of a multilayered approach to infection control.

DRAFT

Finally, OSHA emphasizes that physical distancing is feasible for the vast majority of situations employers may face in their daily job duties. There are a select number of situations where physical distancing is not feasible, and for these situations, employers must implement physical barriers if feasible. And, again, in all cases, employers must implement the other controls required by the standard (e.g., face coverings, facemasks, and respirators, cleaning and disinfection, health screening and medical management, employee notification).

*Methodology*

The physical distancing scenarios OSHA developed include examples of policies and procedures implemented to maintain physical distancing, physical barriers, and other controls based on a review of industry-specific guidance and existing pandemic plans and other sources (ERG, February 25, 2021). The scenarios identify groups of workers who face similar work situations with regard to physical proximity (within 6 feet) of another person (e.g., co-workers, visitors, members of the public), and for whom the same or similar precautions to limit physical proximity can be implemented.

To develop these scenarios, OSHA's contractor—a safety and health subject matter expert—compiled and reviewed COVID-19 plans containing transmission controls which were implemented by individual companies or recommended by various industry organizations and associations. This information was supplemented where needed with additional internet searches, for instance, from news articles, industry surveys, or articles in industry publications that demonstrate how companies in different industries have been implementing physical distancing. The contractor also relied on its professional expert judgment (ERG, February 25, 2021).

The 23 scenarios OSHA developed are listed in Table 3.

**Table 3: Physical distancing scenarios and corresponding 3-digit NAICS codes:**

DRAFT

| Industry | Covered 3-digit NAICS Codes |
|---|---|
| Agriculture | 111, 112, 115 |
| Air Transport | 481 |
| Construction | 236 – 238 |
| Education | 611 |
| Emergency Medical Services | 621 |
| Hair and Nail Salons | 812 |
| Home healthcare, personal care, and companion service providers | 621, 624 |
| Hotels and Accommodations | 721 |
| Long-term Care | 623 |
| In-home Services and facility visits | 238, 561, 624, 811, 924, 925 |
| Manufacturing | 311 – 316, 321 – 327, 331 – 337, 339 |
| Marine Terminals and Longshoring | 488 |
| Offices | 531, 533, 541, 551, 561, and others |
| Onshore, upstream oil and gas sites | 211, 213 |
| Law Enforcement, security guards, and protective services | 922, 441 – 448, 451 – 453, 561 |
| Postmortem Care | 812, 621 |
| Food Services and Drinking places | 772 |
| Retail sales, banks, entertainment venues, and libraries | 441 – 448, 451 – 453, 519, 522, 711 – 713 |
| Shared Housing (i.e., workers that support the operation of shared housing facilities (e.g., housekeeping, maintenance)) | 111 – 113, 211, 213, 611, 624, 721, 922 |
| Shipyards | 336 |
| Transportation | 482, 485 |
| Veterinarians | 541 |
| Waste Management and wastewater management | 562, 221, 924 |

DRAFT

While physical distancing can be maintained in most operations, there are select situations for each scenario developed where physical distancing cannot be achieved at all times without extensive alterations to structures, which OSHA is not mandating. In these situations, other measures still need to be used to reduce the risk. To this end, the scenarios referenced in Table 3 include precautions and controls that can still be implemented even though physical distancing cannot be maintained. These additional controls are a part of a multilayered approach that includes the use of physical barriers, face coverings, ventilation, and other controls required by the ETS (ERG, February 9, 2021; ERG, February 25, 2021).

In reviewing the record, OSHA found that, while exposure to COVID-19 can occur from contact with co-workers or the public as part of workers' job duties in a wide range of industries, many of the processes and controls used to minimize risk are the same or similar across the individual scenario groupings. To this end, OSHA identified 95 unique job categories across the industry sectors with many categories present across multiple NAICS codes. These job categories were cross-referenced with the 23 scenarios developed to develop a job matrix spreadsheet (February 25, 2021). This job matrix spreadsheet was used to identify job categories facing similar situations regarding the ability to maintain physical distance with coworkers and/or members of the public. OSHA expects that for these situations, employers can implement the same or similar precautions, for not only limiting physical proximity, but also for the other multilayered controls required by the ETS. Workers with public-facing job duties such as receptionists, secretaries, and security guards share many of the same or similar exposure control challenges, and employers of these job categories over a wide variety of industry sectors have implemented similar multilayered controls such as physical distancing, the installation of barriers, requirements for face-coverings, and hand hygiene, among others, as discussed below

DRAFT

(February 25, 2021). OSHA concludes, based on the job matrix that evidence of feasibility for one scenario also establishes feasibility for other scenarios to the extent job categories cut across scenarios.

Below, OSHA highlights some of the elements of a few of the scenarios and portions of the job matrix on which it relied. In the discussion below, OSHA will first describe some of the types of jobs workers conduct in most workplaces in the scenarios discussed (or across scenarios to the extent this is supported by the job matrix), and identify some of the unique work processes that are already conducted in a physically distanced manner or that can be easily modified to avoid or reduce physical proximity for each scenario discussed (or, as applicable, across scenarios). OSHA then describes some of the discrete activities where physical contact with others (i.e., the public or other workers) may be necessary or unavoidable, along with the precautions and controls that can still feasibly be implemented for the scenarios (or, as applicable, across scenarios) as part of a multilayered approach to protection, such as face coverings, ventilation, and the use of physical barriers.

In this respect, OSHA's analysis emphasizes the use of physical barriers across a wide variety of affected industry sectors. Physical barriers are required as part of the multi-layered approach to infection control that is at the heart of the ETS. As discussed more fully in the Need for Specific Provisions section of the Preamble, physical barriers, when properly installed, are effective at intercepting respiratory droplets and minimizing the risk of exposure to COVID-19, especially in areas where employees cannot maintain a minimum of 6 feet of distance from coworkers, customers, and members of the general public.

The ETS does not specify the type of material that must be used for physical barriers, but the material must be impermeable to infectious droplets that are transmitted when an infected

DRAFT

individual is sneezing, coughing, breathing, talking, or yelling. The effective design and implementation of physical barriers will differ among workplaces based on job tasks, work processes, and even potential users. Physical barriers must be designed, constructed, and installed to prevent droplets from reaching employees when they are in their normal sitting or standing location relative to the workstation. For example, under the provision, plastic sheeting can qualify as a physical barrier only in situations where it is fixed in place and blocks face-to-face pathways of air between the users on either side while those workers are performing all of their assigned tasks. OSHA found that some employers in poultry processing facilities who have installed flexible plastic sheeting as barriers between employees on the processing line have secured the sheeting in a rigid frame constructed from metal or plastic tubing and securely fastened the barrier surface between employees on the line. OSHA found that other employers hung plastic sheeting from the ceiling in between work stations and tied the bottom edge to the ground securely to prevent flapping while employees work. In addition, workstation partitions and other physical barriers have been installed in a variety of work settings (e.g. offices, retail sales, banks, entertainment venues, and libraries, hotels and accommodations, hair and nail salons, food services and drinking places, education, and air transport) and have been constructed out of plexiglass or other solid clear plastic or acrylic material and designed to be placed onto the ground or work surfaces such as retail counters or office desks, and securely fastened in a fixed position as a barrier to protect employees.

Examples of physical barriers across a wide variety of workplaces is discussed in the scenarios below. OSHA's expert contractor also provided example photos of physical barriers which meet the design and installation criteria of the ETS (ERG, February 25, 2021). Further considerations for the design and implementation of physical barriers to properly block face-to-face pathways of

DRAFT

breathing zones, including whether plastic sheeting, films, curtains, and other non-rigid materials are acceptable materials, as well as installation, are discussed in the summary and explanation of Physical Barriers.

Employers subject to the ETS share a common challenge: finding ways to limit physical proximity (of less than 6 feet) between each worker and other workers, as well as customers, visitors, and other non-employees in the workplace. In the limited situations where physical distancing is not feasible, employers often face similar challenges and employ similar solutions in designing and installing physical barriers to help protect their employees, even though the types of products or services they offer or the work they do vary. For example, employers often install physical barriers with a pass-through space at the bottom for objects and merchandise. A barrier is thus an effective tool in helping to protect a hostess in a restaurant, a security guard at a check point, a receptionist in an office, a cashier in a retail establishment, and any other public facing employee. Employers across all industries have also installed barriers between urinals and sinks in restrooms both as separations between persons using the facility and as a splash guard (ERG, February 9, 2021; ERG, February 25, 2021).

As the assessment below makes clear, OSHA has found no feasibility issues with the implementation of physical distancing or physical barriers in typical operations across affected industries.

*General Office Settings*

General office settings are common across a number of industry sectors. While many office spaces were closed at the start of the COVID-19 pandemic, some are beginning to reopen with new safety measures in place. OSHA developed a physical distance scenario for offices by identifying industry sectors where office worksites are common, including those listed in Table 3

DRAFT

above. OSHA found that employers have successfully implemented a variety of physical distancing measures (measures to keep people 6 feet apart) by incorporating administrative and engineering controls for the various job categories that work in offices such as supervisors and managerial staff, administrative and clerical staff, receptionists, and cleaners and janitorial staff.

Administrative and clerical workers are a common job category within office worksites across a wide variety of industries. In addition to the offices scenario, administrative and clerical workers were identified in a number of other physical distancing scenarios including: education; law enforcement, security guards, and protective services; postmortem care; long term care; and shipyards (although OSHA believes administrative and clerical workers likely work within most scenarios, given that administrative and clerical work is usually necessary regardless of industry sector). Administrative and clerical duties are used in different types of administrative and office support roles and include tasks such as office communications, data sorting, and filing documents. Usually, clerical duties are performed by office clerks, secretaries and administrative assistants.

A number of strategies for maintaining physical distancing as part of a multilayered approach have been implemented for administrative and clerical staff, including establishing remote work and virtual service policies, altering the work environment to limit the number of chairs and workstations, relocating workers to locations that ensure proper physical distancing, and arranging visitor seating areas to be at least 6 feet away from employees' desks. Meetings can be conducted virtually or conference table and chairs can be relocated to areas of the office where physical distancing can be ensured. Employers may also establish occupancy limits for certain rooms (e.g., bathrooms, breakrooms, elevators, lunchrooms, and changing areas), stagger breaks to limit the number of workers on break at the same time, and use signs and markings to

DRAFT

communicate occupancy limits and to remind workers to keep 6 feet apart. Shared equipment, such as copiers or printers, can also be located more than 6 feet apart so that different employees can use that equipment at the same time without having to be close to each other.

OSHA notes that supervisors and managers across a variety of industries have many of the same types of exposures as administrative and clerical staff. They commonly work in communal office areas, engage in collaborative group work, and hold office meetings in conference rooms. Moreover, as supervisors and managers, they implement the physical distancing strategies described above for the facilities where they work, and not just to apply to administrative and clerical staff.

While receptionists are a common job category within office worksites, they are also employed in a variety of industry sectors. Receptionists were identified in four additional physical distancing scenarios including: education; hair and nail salons; retail sales, banks, entertainment venues, and libraries; and veterinarians (although, like administrative and clerical staff, receptionists likely work in most scenarios). Receptionists are public facing employees and their jobs include tasks which routinely put them in contact with the public, such as greeting and directing visitors appropriately, responding to inquiries, billing and scheduling, and maintaining security and telecommunications systems.

OSHA identified a number of physical distancing strategies that have been commonly used to increase physical distancing for receptionists. When telework is not possible, employers have eliminated reception seating areas, closed lobbies, and required clients and visitors to phone or text ahead for entry into the workplace. In addition, signs and floor marks indicating 6-foot spaces where lines can form in reception areas have been found to help maintain physical distance between visitors and receptionists. When limiting access to reception areas is difficult,

DRAFT

employers have reduced occupancy by only allowing seating at every other chair in waiting areas. Touchless or remote payment and scheduling options have been successfully used to limit face-to-face interactions with customer clients.

Cleaners and janitorial staff is another common job category identified within office worksites, as well as other scenarios including: education; home healthcare, personal care and companion service providers; hotels and accommodations; and shared housing (although, like the two job categories discussed above, cleaners and janitorial staff likely work in most scenarios). Cleaners and janitorial staff perform tasks such as sweeping and mopping floors, removing trash, cleaning surfaces, moving furniture and lifting bulk material for cleaning or maintenance, and other disinfecting and sanitation tasks.

In general, cleaners and janitorial staff already take precautions for protection from the hazards encountered during routine job tasks, which supports OSHA's finding that compliance with the requirements of the ETS for this job category prevents no feasibility barriers. In addition, OSHA's review found that physical distancing for these jobs can be feasibly maintained by scheduling arrival times to prevent cleaning and waste removal tasks when other workers are in the office. During cleaning and maintenance, access to the area can also be roped off to ensure that cleaners and janitorial workers can maintain physical distance from other employees.

As discussed above there are many options of potential controls to provide physical distancing for supervisors and managers, receptionists, administrative and clerical workers, cleaning and janitorial staff, and other office workers who work in office settings. However, there may be limited instances where employees might be unable to physically distance all of the time. As part of a multilayered approach to transmission control, physical barriers have been

DRAFT

installed in office settings across all industry sectors. For example, workers in office settings (staff and managers) often spend the majority of the day at their desks or other fixed work stations. For these situations, employers have installed plexiglass barriers or partitions between workstations and between public facing staff and visitors, customers, clients, and other non-employees. When it is not feasible for employees to be properly distanced from each other, barriers must also be installed between the employees.

*Law Enforcement, Security Guards, and Protective Services*

A physical distance scenario developed for law enforcement, security guards, and protective services identified a number of industry sectors where job categories within the scenario are common (including industry sectors within other scenarios in Table 3). OSHA found that law enforcement—including police officers, correctional facility staff, and security guards—have successfully implemented a variety of physical distancing controls to maintain 6 feet of physical distance from other people. These three categories of law enforcement have similar roles and responsibilities, and all potentially interact closely with people at various times (e.g., apprehending a subject).

Police officers protect lives and property, and gather facts and evidence of possible crimes. Common physical distancing controls include suspending or reducing in-service training and avoiding the grouping of officers together in enclosed areas. Also common is the use of virtual or remote roll calls and shift changes to avoid clustering of officers and support staff. OSHA also found that physical distance could be achieved while transporting detainees by limiting the number of inmates or detainees transported in a van or bus, staggering seats where necessary, and closing off seats near the driver and guards. Restricting or, in some cases, eliminating public access to police facilities is also a feasible solution to maintain physical

DRAFT

distance. While it is inevitable that many police officers will need to be within six feet of other people during the course of their duties, every effort should be made to shorten the duration of those contacts. For example, after securing a suspect, the suspect can be placed into a secure space behind a barrier, or into a space where the police officer may retreat behind a barrier, as quickly as possible. Police employers should provide their officers with disposable face coverings so that when possible, they can encourage the suspect to wear a face covering.

Correctional facility staff enforce rules and keep order within jails or prisons, supervise activities of inmates, inspect facilities to ensure that they meet security and safety standards, search inmates for contraband items and file reports on inmate conduct. Correctional facilities have implemented a variety of physical distancing strategies in response to COVID-19. For example, employers have implemented requirements to affix tape to mark a safe distance in front of public-facing staff (e.g., a receptionist) to remind visitors who are standing in line to maintain appropriate distance. In addition, to maintain physical distancing, employers limit the number of inmates (or other detainees) transported in a van or bus, stagger seats where necessary, and close off seats near the driver and guards. Correctional facility employers also suspended or reduced in-person visitation and detainee activities and replaced them with virtual visitations and activities, and restricted or minimized detainee movement in the facility to the extent feasible.

Security guards were identified as a job category in multiple scenarios including: education; food services and drinking places; retail sales; banks, entertainment venues, and libraries; and shared housing (although security guards are also likely employed in all or most scenarios). Common physical distancing controls include staggering work shifts and limiting or ending in-person meetings. The use of walk-through metal detectors instead of hand-held wands and electronic mobile credentials to avoid the need for security officers to physically check

DRAFT

individuals have also been implemented (if wands are used, the person being wanded should face away from the security guard). Electronic mobile credentials can also be centrally managed from a remote location, limiting the need for personnel to visit badging offices. Employers have utilized signs, floor markings, and ropes to mark a 6-foot distance around security guard stations to remind people who are standing in line to maintain appropriate distance from the security officer and other people in line.

As part of a multilayered approach to transmission control, employers have also installed physical barriers to protect these workers when they are at fixed work stations. For example, law enforcement employees, such as correctional officers and police officers, are frequently within 6 feet of a subject to complete processing. But employers have installed physical barriers to provide protection from COVID-19. Physical barriers in patrol vehicles between the front officer compartments and rear subject areas have also been installed. Across industry sectors, employees working in security checkpoints are commonly unable to maintain physical distance from non-employees who need to be checked-in or are waiting in line (for example, during identification screenings at a bar or in a federal office building). In such circumstances, the installation of barriers helps protect security personal interacting with the public.

DRAFT

*Transportation*

OSHA developed a physical distancing scenario for transportation and identified applicable industry sectors within the scenario. The transportation scenario covers a number of job categories including, for example, school and public bus drivers, and ticket attendants. The nature of the transportation sector often limits the ability to accommodate physical distancing measures, increasing the risk of physical proximity (within 6 feet). However, OSHA found that organizations and companies have implemented creative physical distancing measures

to keep workers and passengers safe. For example, limiting occupancy on transit vehicles, while increasing the number of routes and increasing the number of vehicles in service, are strategies that have been implemented to promote physical distancing between passengers and transit employees. OSHA found that where transit vehicles had a designated operator's compartment, like on a subway train, ensuring operators utilize designated cabin doors, remain within the compartment, and utilize intercoms to communicate with passengers were commonly implemented strategies. In addition, the use of signage to indicate rules regarding passenger seat spacing from employees, creating a one-way flow for entry into and exit from the vehicle, requiring rear-door boarding (when possible), and restricting entry at extra doors closest to the operator are all feasible strategies that are used by employers for maintaining physical distance. Where possible, ticket takers can also use virtual ticket taking or scanning, such as at a kiosk.

As part of a multilayered approach to transmission control in this sector, physical barriers have been installed in vehicles such as public transportation, school buses, paratransit, taxis, and rideshare vehicles, to protect employees from passengers and other non-employees. For example, employers have installed operator shields made of plexiglass or plastic in the front of buses, thus providing a protective shield that creates a barrier between the bus operator and their riders (both when they get on and off the vehicle and when they are seated). Many employers of ride-share drivers have installed plastic curtains, sheeting, or barriers between the passenger and driver compartments, and prohibit passengers from riding in areas in close proximity to the vehicle operator. Employers have also installed plexiglass enclosures around kiosks to protect ticket distributors and other employees within from others. Employers have also required that passengers and employees wear face coverings as part of a multilayered approach to infection control.

DRAFT

*Hair and Nail Salons*

The hair and nail salon industry includes barbershops, beauty salons, hair salons, and nail salons. Hair and nail salon job categories include barbers, hairstylists and hairdressers, shampooers, hair colorists, nail technicians (manicurists, pedicurists), cosmetologists, and technicians-in-training who perform supporting tasks as they obtain and work toward becoming a licensed stylist.

Tasks in this sector may include laundry, cutting hair, giving manicures or pedicures, shampooing, cleaning and disinfecting tools and work areas, and administrative tasks such as scheduling, answering phones, and handling payments. A number of these tasks inherently preclude physical distancing. However, employers in this industry have broadly implemented a variety of controls to maximize physical distance between employees, customers, and the general public in their operations to the extent possible. (Many of the controls designed to maintain 6 feet of distance among clients also protect workers.)

In salon treatment areas (e.g., salon chairs, shampoo stations, manicure/pedicure stations), for example, employers have limited the use of salon chairs to ensure 6 feet of space can be maintained and ensured that salon technicians use their own tools and equipment rather than moving within 6 feet of a co-worker to borrow or use shared tools or equipment such as shaving foam dispensers, extra aprons, or other such materials. OSHA also found that many companies were limiting services to one service at a time or making some services unavailable to reduce the number of people in the facility at any one time. Increasing the overall number of hours the business is open has also been used to reduce occupancy and ensure physical distancing. Adopting an appointment-only service policy, eliminating walk-ins, and establishing

DRAFT

contactless scheduling and payment systems have also been used to ensure that limited occupancy is maintained.

Physical proximity cannot be avoided during some hair and nail salon job tasks. Hair services (shampoo/condition, cut, style) and nail services (manicure/pedicure) are job tasks performed by stylists, barbers, and cosmetologists, where physical proximity with the public or other workers is necessary or unavoidable to conduct the work. For hair and nail salons, the 6-foot physical distance guideline is not feasible because the technician is working directly on a client's head, hands, or feet. As with other industries with public-facing employees, OSHA found that employers have installed physical barriers at fixed workstations in hair and nail salons, such as at cash registers or reception desks, as a means of protecting employees from others (e.g., customers and other non-employees) where online or remote payment processing is not feasible. A number of employee jobs, such as salon technicians, barbers, hairstylists and hairdressers, shampooers, hair colorists, nail technicians, and cosmetologists, necessarily involve tasks where physical proximity (within 6 feet) with customers is unavoidable. As part of a multilayered approach to transmission controls in hair and nail salons, physical barriers have been installed for these workers. To this end, employers have commonly installed barriers between workers and clients with ample space cut out to allow the workers to provide a manicure or pedicure. In addition, physical barriers have been installed between workstations where workers provide services to clients (for example, between salon chairs, salon shampoo basins, and hair coloring and treatment stations to protect employees from exposure to other customers that employee is not directly serving, as well as other employees).

Finally, common controls that have been implemented to protect workers as part of a multilayered approach to infection control include requiring workers to wear a face shield and

DRAFT

face covering, as well as gloves. Employers have also established a "before and after service" protocol in which all clients are not only required to wear a face covering, but also must wash their hands or use alcohol-based hand sanitizer that contains at least 60% ethanol or 70% isopropyl alcohol before work is done, and in which workers wash their hands and sanitize their tools between each client.

*Educational services*

Preschools, Kindergarten to grade 12 (K-12) schools, and colleges and universities have implemented a variety of distancing controls to limit physical proximity (within 6 feet of another person) for most job categories and tasks. A wide variety of job categories exist in the education sector including administrators, teachers, school nurses and other student health services, social workers and mental health professionals, support staff (e.g., security guards and food preparation staff), lab technicians, researchers, librarians, and athletic staff. OSHA found that a wide variety of physical distancing control options have been implemented as a part of overlapping controls in the educational service sector. For example, in most places, classroom instruction has moved online (i.e., remote learning), and where in-classroom instruction still occurs, employers have adjusted school schedules and implemented protocols to accommodate physical distancing (e.g., staggering school start times or alternating in-person instructional days with distance-learning days). There are also many options for school staff to maintain distance from others, including administrative controls and use of in-class technology for digital drop boxes or a designated drop-off area for physical materials. Schools have also provided staff services (e.g., guidance counseling) virtually or by appointment only to limit occupancy of offices and waiting areas.

Physical proximity cannot be avoided for some educational services, such as when preschool and childcare providers care for young children (e.g., diapering, feeding, holding of

DRAFT

infants) or during the clinical evaluation of sick students. For these operations, physical barriers have been installed in schools and educational setting as part of an overlapping suite of controls to protect teachers and other employees from COVID-19. Barriers have been installed between staff (e.g., administrative, clerical, guidance staff) and other staff, as well as the parents, students, and other non-employees with whom they must interact. Barriers have also been installed in those situations where it may not be practical for a teacher to maintain physical distance from a student, for example, when reviewing a student's work one-on-one, working with a student on motor skills (e.g., holding a pencil), or collaborating in a shared elective space (e.g., art, family and consumer sciences, vocational classes) to assess progress, teach special techniques in art or science, or repair lab equipment. In these circumstances, plexiglass dividers can be positioned between teachers and students to provide a physical barrier when students are sitting at their desks.

Finally, educational facilities have successfully implemented a number of controls as part of a multilayered approach to infection control, including requiring all workers and students to wash their hands or use an alcohol-based hand sanitizer that contains at least 60% ethanol or 70% isopropyl alcohol before and after direct contact with each other, and requiring the cleaning and disinfection of surfaces throughout the facility after each use, if feasible, or on a regular schedule. OSHA has found that controls to improve ventilation (e.g., opening windows and utilizing portable air cleaners with a HEPA filter), and moving as much direct instruction outdoors, have been implemented to protect educational service workers.

*Manufacturing*

Manufacturing industries employ a variety of workers including administrative, clerical, and management staff; production, assembly, and processing line workers; technical and

DRAFT

maintenance personnel; warehouse workers; and loading dock workers. OSHA found that many strategies for maintaining physical distancing among employees have been implemented in manufacturing workplaces. A survey of its members conducted by the Manufacturers Alliance for Productivity and Innovation (MAPI), published May 1, 2020, found that 89 percent of respondents had implemented physical distancing at their facilities at that time (and others have likely done so since). Similarly, a survey of the food and beverage manufacturing industry found that between 83 and 89 percent of respondents were promoting physical distancing in surveys conducted in March and April 2020 (Clear Seas Research, April 22, 2020).

Across all types of manufacturing settings, many of the processes used to achieve compliance with the ETS's physical distancing requirements are the same or very similar. Broadly, these include reducing the number of workers on site in each shift, adding additional shifts, staggering shifts to reduce the number of employees working at the same time, increasing the time between shifts, and using mobile or web based timekeeping in place of physical time clocks. OSHA found that employers at a wide range of manufacturing business also modified their clock in/clock out procedures, installed additional time clocks, and utilized mobile or online time-keeping programs to prevent congregating near time clocks and security entry/exit gates.

At loading docks, manufacturing employers have implemented a range of physical distancing controls such as restricting dock activities (e.g., loading and offloading, sorting and segregation, routine inspection and count) to the employers' own shipping/receiving workers, and requesting that truck drivers stay in their trucks and do not enter the building unless there is an urgent need (e.g., to use a restroom). In this manner, truck drivers need not spend unnecessary time on the dock, where they can come within physical proximity to shipping/receiving workers.

DRAFT

In warehouse settings across manufacturing sectors, employers have implemented a number of measures to maintain physical distancing between employees. For example, employers have increased the use of lifting devices such as hoists to limit the need to have multiple workers lifting heavy or awkward items, as well as the use of mobile workstations and mobile handheld computers to allow workers to operate freely within the warehouse while maintaining proper physical distancing.

Strategies for maintaining physical distance during the fabrication and assembly of products include modifying the alignment of workstations so that workers are at least 6 feet apart and are not facing each other, staging the delivery of parts and raw materials to workstations at designated drop off areas to maintain physical distancing between the worker delivering the materials and assembly line workers, and using production transfer aids (e.g., shelves, push boards, flow racks, or modular carts) to allow for increased physical distance between workers. For processes that involve multiple simultaneous operations on the same manufactured unit (e.g., a team working on the driver's side of a car and a team working on the passenger side), tasks may be performed serially instead of concurrently, so that no worker comes within 6 feet of another. In food processing operations, reducing line speeds allows for fewer workers, who can be spaced farther apart on processing lines. Other measures include prioritizing production of products that allow for more spacing between workers and allowing one worker additional time for cleaning or other operations that are traditionally done by two workers.

As discussed above, many employers can alter work practices to promote physical distancing. However, some employees that engage in manufacturing work on production lines, in warehouses, and on loading docks, may sometimes need to work in physical proximity to each other during the production, processing, packaging, sorting, storing, and shipping of products.

DRAFT

Employers have installed physical barriers between manufacturing workers across the manufacturing sector as part of an overlapping approach to protect employees from COVID-19.

In some processing and assembly lines, workstations (e.g., on conveyor belts and assembly lines) cannot be realigned or moved, making it infeasible to maintain 6 feet of distance between workers. In these cases, companies have installed barriers to protect employees. A MAPI member survey published December 11, 2020, found that 80 percent of companies were using plexiglass dividers as barriers (MAPI, December 11, 2020). Moreover, a CDC survey of meat and poultry processing facilities conducted in April–May of 2020 found that 62 percent had installed physical barriers (Waltenburg et al, July 7, 2020).

Depending on the location and configuration of equipment, and the tasks employees are performing, manufacturing facilities have used different forms of physical barriers. Manufacturers have constructed physical barriers out of rigid plexiglass, metal plates, or plastic film on a rigid framework with a fixed position, and erected barriers between the right and left sides of employees. Where a rigid physical barrier is not feasible, manufacturing facilities have hung plastic sheeting between the sides of the employees. This can be an effective barrier if the plastic sheeting is of sufficient quality to be capable of cleaning and if the plastic sheeting is properly secured to prevent it from moving out of its intended position. Plastic sheeting or curtains have also been secured in a fixed position and hung above conveyor belts in front of employees facing each other, with a gap left for the employees' hands and the product to pass underneath, to block face-to-face transmission pathways.

*In-Home Services and Facility Visits*

Many workers visit and perform work in private residences or in facilities that are not controlled by their employers. In-home repair workers typically perform their job duties at a

DRAFT

customer's home, commonly within an enclosed space. While it is not typical that these workers need to have physical proximity (within 6 feet) to residents, there may be times when this might happen.

In-home and facility services are a major component of a wide range of industries included in Table 3 (Physical distancing scenarios and corresponding 3-digit NAICS codes), above. Examples of in-home and facility service jobs include social workers and public health workers providing non-medical support services, house cleaners and janitorial staff, and facility inspection services (e.g., home inspectors, insurance inspectors, and other health inspectors). In-home and facility service jobs also include trade workers, repair and maintenance workers, installers, service technicians, IT technicians, and vendors who visit residences and facilities to install, maintain, and fix appliances, mechanical equipment, and communication systems, or replenish supplies (e.g., vending machines, office supplies, office pantry items).

Many physical distancing controls have been successfully used by employers that provide in-home services and conduct facility visits, including requiring pre-visit customer and client COVID-19 screening, utilizing contactless payment methods, sending necessary paperwork ahead of time, using contactless options for documentation, utilizing virtual services such as video chats where possible, and making arrangements to meet for services outside when possible. OSHA found that many employers have implemented policies to provide pre-visit instructions regarding their procedures to ensure physical distancing. These procedures include instructions for all people within the household (except for the direct customer if needed) to go to another room, or at a minimum, maintain at least 6 feet of distance from visiting workers, and ask customers to also keep their pets at least 6 feet away from the employee providing the in-home service (e.g. plumbers, electricians, appliance repair workers). OSHA also found employer

DRAFT

procedures implemented to instruct workers making repairs or installing new equipment to mark a perimeter (using colored tape or some other visual) to demarcate a work area for themselves that will serve as a physical reminder for customers to maintain a safe distance.

While these basic controls have been implemented by a wide range of in-home and facility service providers, there are nonetheless some tasks where workers performing in-home services and facility visits cannot always avoid physical proximity with customers and clients (e.g., when virtual services or contactless payment and documentation are not possible). In addition, while employers have taken steps to provide employees with the necessary equipment to safely allow tasks to be completed by one person, some services cannot be completed by a solo worker, and in these instances, co-workers may not be able to maintain 6 feet of distance from one another to install or service a piece of equipment. For situations such as these, feasible control measures to reduce the risk of transmission include assigning workers to "bubbles" or cohorts to reduce the number of other individuals with whom a worker comes in physical proximity.

Finally, as part of a multilayered approach to infection control, employers have required employees, visiting workers, and customers to wear face coverings, as this standard contemplates. They have also required workers to wash their hands or use hand sanitizer thoroughly after being in physical proximity with customers or co-workers.

*Retail sales, banks, entertainment venues, and libraries*

Retail establishments (e.g., grocery stores, pharmacies, gas stations, auto repair centers, clothing stores, hardware stores), banks, gyms, libraries, and entertainment venues (e.g., museums, theaters, sports arenas, and casinos) include a wide range of job categories that require contact with other employees as well as the general public. Examples of jobs that require

DRAFT

interfacing with the public include cashiers and baggers, circulation desk and front desk attendants, bank tellers, ticket-takers, workers who help customers with transactions such as purchasing products or tickets, floor workers, sales associates, customer service representatives, personal fitness trainers, ushers, and others who work directly with customers to assist customers and answer questions, as well as managers and supervisors who interact with customers and work closely with workers. Other examples include pharmacists who must be available for customer consultations, and in some cases, to administer vaccines. In addition, employees may perform curbside pick-up assistance and delivery staff may be asked to bring products out to a customer's car or drive to a customer's residence and drop products off at their doorstep.

Common physical distancing controls that have been implemented to protect workers in public interfacing positions fall into three broad categories, which aim to: 1) reduce or space out the number of customers entering an establishment; 2) promote contactless payment, transactions, and admissions; and 3) maintain appropriate physical distance between workers and customers inside establishments. Employers in the gaming industry also limit building occupancy.

While these basic controls have been implemented in a wide range of establishments, there are nonetheless some tasks for which physical distancing may not be possible, such as: handling some in-person purchases, transactions, and admissions; providing customer service where physical proximity is necessary such as garment fitting; or interacting with customers and co-workers who encroach into their space. To address these situations, employers in this industry sector have installed physical barriers to protect workers that interact directly with the public. Workers in these settings often need to be in physical proximity to visitors, customers, and other non-employees who enter the worksite (e.g., stores and other venues). Employees

DRAFT

across these sectors often have to handle in-person purchases, transactions, and admissions. For example, cashiers, bank tellers, and ticket takers may need to be within 6 feet of a customer when contactless transactions (e.g., payments) are not possible, and, to address this, employers have installed plexiglass barriers between cashiers and customers at checkout stations. Also, employers in the gaming industry have installed physical barriers to protect card dealers or others operating gaming tables, who may have a hard time maintaining 6 feet of physical distance from their customers in some circumstances. Some businesses (e.g., casinos, theaters) conduct temperature checks on guests and team members before allowing them on the premises. The person performing these checks must be within 6 feet of the people they are checking and employers have constructed plexiglass barriers with slots for the employee to reach through and take temperatures.

Finally, similar to in-home services, as part of a multilayered approach to infection control, employers in this industry sector have required both employees and customers to wear face coverings, as contemplated by this standard. They have also instructed workers to wash their hands or use hand sanitizer thoroughly after being in proximity to customers or co-workers.

*Food Services and Drinking Places*

OSHA developed a physical distancing scenario for the food services and drinking places sector. OSHA identified a wide variety of job categories employed in this sector, including managers and supervisors, hosts/hostesses, servers, bartenders, cooks, and dishwashers. Many of the controls designed to maintain physical distancing between customers also help to protect workers during their interactions with customers. Organizations such as the National Restaurant Association and the American Industrial Hygiene Association provide examples of physical distancing controls that have been implemented across all areas of these establishments including

DRAFT

reception/waiting, dining, bars, takeout, restrooms, kitchens, and breakrooms. Posting signs reminding workers and guests about physical distancing, adopting a reservations only policy, and enforcing limited occupancy in the restaurant have all been implemented to maintain physical distancing. Employers have also redesigned seating arrangements to ensure that there is at least 6 feet between tables to enable wait staff to maintain as much physical distancing from each other and diners as possible. Encouraging online ordering, payments, and curbside pick-up or delivery options can also help ensure customers and employees maintain physical distance. Even for dine-in customers, there can be online ordering and self-serve pick up windows, as well as electronic/online payment options, that can help employees and customers maintain physical distance.

The nature of food service and drinking operations entails that physical distancing between coworkers and customers cannot always be achieved. For example, the reception/host/bar staff may need to be within 6 feet of customers to lead guests to a table, serve them or process payment. In these situations, food services and drinking places have implemented physical barriers to protect workers from customers (e.g., bartenders, servers, hosts and hostesses, cooks, and bussing staff). Plexiglass barriers and sneeze/splash guards have been installed at host and hostess stands, bars, and pick up counters. In kitchens, food prep areas, and dish washing and bussing areas of establishments, employers have installed physical barriers between work stations to protect workers. Where security personnel must be in close proximity to guests to perform checks such as ID age verification, employers have installed physical barriers to protect those security personnel. Barriers between booths will primarily separate diners in adjoining booths, but they can also reduce exposure for employees busing adjoining tables.

DRAFT

As part of a multilayered approach to infection control, employers have also implemented requirements for not only employees, but also customers entering the establishment, to wear face coverings, as contemplated by this standard. Servers waiting on diners who have removed their face coverings to eat or drink can face increased risk because of the lack of source control from a contagious diner. To address these situations, employers have directed servers to minimize the amount of time spent in close proximity to customers when their face coverings are off, thereby maintaining a 6-foot distance for as long as feasibly possible (while sharing information and taking orders, etc.). Finally, where it is not possible to reconfigure workstations, kitchen staff may not be able to maintain 6 feet of physical distance from one another, but employers have utilized controls such as staggering employee work schedules and increasing the frequency of surface cleaning and disinfection.

*Emergency Medical Services*

OSHA developed a physical distancing scenario for Emergency Medical Service (EMS) organizations. EMS workers cover a number of job categories including emergency medical technicians (EMTs), paramedics, and cross-trained firefighters serving in the capacity of paramedics or EMTs.

OSHA identified a number of common physical distancing controls implemented by EMS providers, which limit the number of onsite workers within physical proximity of patients and others, and also limit crowd size during emergency response. First, to limit the number of EMS workers that respond to a call to those absolutely necessary, EMS employers have implemented polices to coordinate with the emergency response operator (e.g., the 911 operator/dispatcher) on how many EMS responders are needed. Also, employers have implemented policies to ensure that the emergency response operator coordinates with law

DRAFT

enforcement to disburse or move unnecessary people before the ambulance arrives. Additionally, employers have instituted work practices where one EMS worker conducts the initial patient evaluation and performs medical treatment, remaining in radio communication with the other EMS worker, who will enter to assist only if necessary. EMS employers have also instituted policies to limit the number of workers in the ambulance to those who are medically necessary and to encourage family members to follow the ambulance in their own vehicle rather than riding in the ambulance.

EMS workers cannot always avoid proximity to coworkers or patients during some operations including, for example, engaging in emergency medical care, transporting patients in ambulances, and transferring patients to health care facilities. When EMS workers respond to an emergency, they are involved in evaluating and treating the patient onsite before transporting the patient as necessary. EMS workers may need to work as a team of two in order to perform some tasks (e.g., while performing cardiopulmonary resuscitation (CPR) and using a bag valve mask also known as an Ambu bag). In addition, arriving EMS workers could be within 6 feet of people at the site, including family members and the general public who may have gathered.

Employers of emergency medical services (EMS) workers have installed physical barriers to protect their workers in at least some of these situations. For example, physical barriers are often installed between the workstations of emergency response operators, who assist in coordinating the response to emergency situations (e.g., for the EMS system or the public health system, and in 911 call centers or healthcare facilities). Employers have also installed physical barriers between the treatment compartment of ambulances and the driver's compartment to protect drivers and other workers who need not be exposed to patients.

DRAFT

OSHA also identified a number of strategies that have been used by EMS providers as part of a multilayered approach to infection control. Employers have implemented policies for requiring employees to wear appropriate respiratory protection and other PPE, placing a face shield on the patient when possible, and requiring family members to wear face coverings or leave the area while EMS workers respond to emergencies in patient homes. In addition, employers have instituted protocols for moving a patient with confirmed or suspected of COVID-19 outside or in a more ventilated area for treatment, where medically possible (note that the ETS requires healthcare workers to wear respirators when treating a patient who is confirmed or suspected to have COVID-19 as well as when they are exposed to aerosol generating procedures).

In some situations, EMS workers might need to ride in the cab within 6 feet of each other as well as the patient being transported. In these situations, overlapping controls, such as requiring all EMS workers in the patient compartment to wear appropriate PPE and to wash their hands or use an alcohol-based hand sanitizer that contains at least 60% ethanol or 70% isopropyl alcohol, have been implemented. Moreover, as stated, where feasible, physical barriers can be constructed to isolate the driver's cab from the rear patient care area. In addition, patients riding in the rear compartment can wear a face covering and face shield, when possible, or at least a face shield when a face covering is not possible. Employers have also established procedures to open outside air vents in the cab and turn on the rear exhaust ventilation fans to the highest setting to create a pressure gradient toward the patient area.

It is also common that EMS operations must quickly return an ambulance to service after responding to an emergency involving, or transporting patients who are, COVID-19 positive. In such circumstances, multiple EMS workers must often concurrently participate in cleaning and

DRAFT

disinfection of the patient area in the ambulance. In these situations, employers have used outdoor cleaning areas or indoor exhaust ventilation, in addition to following widely established polices requiring PPE and face coverings.

*Long-term Care*

Long-term care employers operate nursing homes, retirement communities, assisted living facilities, and intermediate and continuing care facilities. There are a wide range of job titles for workers in this industry including healthcare providers (e.g., physicians, nurses, nurses' assistants, orderlies, physical, occupational, and speech therapists, home health aides, personal care aides, and psychiatric aides), as well as support staff (e.g., facility administration, reception, engineering and maintenance, housekeeping, laundry, food service, transportation, pharmacy, and security).

OSHA identified a number of physical distancing strategies that have been implemented in various areas of long-term care facilities such as reception areas, waiting rooms, dining rooms, and common areas. These strategies include: restricting the number of visitors; limiting access to the residential area to essential workers (i.e., maintenance workers performing non-critical tasks and staff performing billing services would not be granted access); increasing the number of meal services; limiting the number of residents in the dining area at one time; and providing room service.

Although physical distancing can be feasibly maintained most of the time, there are some situations where workers in long-term care facilities cannot always avoid physical proximity with residents or co-workers. Long-term care employers have installed physical barriers to protect employees in many of these situations. For example, resident care and front desk staff may need to be within 6 feet of visitors during visitor check-in or when providing information or

DRAFT

assistance, and administrative staff may have a central counter for information and resources for residents. In these situations, employers have installed physical barriers between workstations and visitor or resident areas. Food servers and aides may need to be within 6 feet of a resident when serving food, servicing or clearing buffet food lines, and when providing assistance. In these situations as well, employers have installed physical barriers between employees and residents.

Healthcare providers may also need to provide care or therapy in resident rooms or other care/therapy areas. As part of a multilayered approach to infection control, some employers have required workers caring for residents to wear a gown, safety glasses, gloves, a surgical mask (for situations with no aerosol-generating procedures), and an N95 respirator (for situations where aerosol-generating activities or procedures are likely or when providing care to residents with suspected or confirmed COVID-19). Also, in accordance with American Health Care Association/National Center for Assisted Living (AHCA/NCAL) recommendations, employers have, to the extent possible, reduced the frequency of routine procedures, such as taking vital signs and weights, and have also required residents to wear a face covering when staff enter their rooms or when receiving care/therapy from a healthcare provider, unless they are medically unable to do so. Many employers have also implemented cohorting procedures for staff and patients (i.e., assigning staff to specific residents and only those residents) while minimizing staff working across units (AHCA and NCAL, April 21, 2020).

DRAFT

*Postmortem Services*

OSHA developed a physical distancing scenario for postmortem care organizations. Job titles include: funeral home directors and workers who arrange and coordinate visitations and funerals and transport deceased bodies from healthcare facilities and residences to funeral

homes; cemetery staff who prepare gravesites and maintain cemetery grounds; mortuary technicians, including embalmers and crematorium technicians, who prepare bodies postmortem for public viewing, burial, or cremation; medical examiners, forensic pathologists, and autopsy technicians who examine bodies postmortem; and administrative and clerical staff.

The postmortem care industry has implemented a variety of physical distancing controls to prevent physical proximity (within 6 feet) of other people in most operations. Physical distancing controls for these job categories are meant to keep workers and, in some cases guests, at least 6 feet apart. These strategies include posting reminders of the need to maintain at least 6 feet of physical distance from other staff and guests, where possible, training workers on proper physical distancing relative to other workers and guests, and establishing work schedules (e.g., alternating days, extra shifts) that reduce the total number of workers in a facility at any given time. In addition, many employers require workers to limit the number of staff in the prep/exam room at any given time to the minimum number necessary to safely embalm, prepare, or examine the decedent.

In the postmortem services industry, employers have also installed physical barriers to protect their employees from other people (e.g., other staff and visitors) at reception counters, in consultation rooms, and in offices, for example.

*Construction*

OSHA developed a physical distancing scenario for construction jobsites, which generally have a broad range of job titles onsite at any one time. These include project engineers or supervisors, heavy equipment operators, trade workers, laborers, and miscellaneous support. Several areas at construction jobsites have been identified where physical distancing controls have been implemented. For example, break rooms can be reconfigured or moved outside where

DRAFT

possible, and break times can be staggered in combination with floor markings and occupancy limits. Meeting rooms can also be reconfigured with floor markers, or meetings can be moved to a virtual platform.

Office areas or project trailers are a common area for gathering on a jobsite. Physical distancing can be achieved in these areas by rearranging work stations, using floor markers, prohibiting unauthorized employees or contractors from entering, allowing administrative personnel to work remotely, moving meetings outdoors, and temporarily discontinuing or adjusting methods for clocking in or out.

Often the largest areas with the most employees in this scenario are new building and outdoor construction project sites. Some examples of ways to physically distance in these areas are staggering shifts, limiting access to only personnel that are essential for project continuity, limiting the occupancy of common areas, implementing controls on where and how to maintain physical distance (e.g., floor markings), using lifting equipment to reduce the need for multi-person lifts, ensuring that shelters used to keep workers warm or cool have ample space and proper ventilation, and limiting elevator or hoist occupancy.

For heavy mobile equipment, employers can ensure employees maintain physical distancing by not allowing passengers in the equipment and requiring the use of hand signals or radios for communicating. For the renovation of occupied buildings or residences, physical distancing can be achieved by scheduling work when the building or residence has low or no occupancy, sealing or segregating construction areas, with separate entry and exit points, limiting worker occupancy, using lifting equipment to reduce the need for multi-person lifts, conducting client and site inspections virtually, and arranging for contactless payments.

DRAFT

Finally, travelling to and from work sites can affect all employees. While physical distancing can be achieved by driving separately, there are occasions where it is not feasible for everyone to do so. For example, workers sometimes take employer-provided buses or vans to work, and, in such cases, physically distancing can still often be achieved by limiting the number of passengers, having the driver exit the bus or van during loading and unloading, and blocking off seats as needed.

Although physical distancing is often possible, by the nature of construction work, there are some tasks where physical distancing may not be feasible at all times, such as lifting heavy or awkward materials when a lifting device cannot be used. However, even if physical distancing is not feasible, employers can continue to engage in a multilayered approach to infection control by requiring employees to wear face coverings, as required by the ETS, minimizing the time of physical proximity, improving ventilation by opening a window if possible, conducting a job hazard analysis to identify other possible controls, and, if feasible, providing supplemental ventilation.

As with other scenarios, health screening personnel need to be in physical proximity to employees during temperature checks. In these circumstances, employers in the construction industry have installed physical barriers to protect their employees. In addition, as part of a multilayered approach to infection control, screening personnel can use touchless digital thermometers and wear face coverings, full face shields, and gloves, and employees that are being screened can wear face coverings.

Workers may not always be able to maintain six feet of distance from tool room attendants when picking up or returning tools. In such situations, employers have installed physical barriers with openings to accommodate tool checkout while still protecting the tool-

DRAFT

room attendant. Moreover, as part of a multilayered approach to infection control, all employees must still wear face coverings.

Similarly, residential and commercial construction sites have trailers and similar spaces, with supervisors and project managers coming and going to coordinate the construction project and interact with workers, contractors, and clients, and these spaces may not be large enough to accommodate physical distancing. In such cases, where physical distancing cannot be achieved by other means such as schedule changes or video conferencing, employers have installed plexiglass barriers or shields between workstations. Employers have also required all personnel to wear face coverings and used portable air cleaners with High-Efficiency Particulate Air (HEPA) filters to supplement trailer ventilation as part of a multilayered approach to infection control.

In addition, barriers such as sheeting or plexiglass can be used between workers. To this end, employers laying water mains and other utilities at commercial and residential construction sites have installed mobile plexiglass barriers that can be adjusted in height and angle between various employees, such as pipe fitters, excavators, welders, and electricians, working within 6 feet of each other for extended periods of time.

*Marine terminals and Longshoring*

OSHA developed a physical distancing scenario for marine terminals and longshoring organizations. Marine terminals include docks, berths, wharves, and structures for loading and delivery of waterborne shipments (or passengers), as well as the associated cargo handling equipment and storage facilities. Longshoring workers conduct activities and operate equipment to transfer cargo between ships and shore.

DRAFT

While physical distance can be maintained most of the time in these sectors, employees cannot always avoid proximity to coworkers during some marine terminal and longshoring operations (e.g., when docking assistants, stevedores, and longshore workers need to interface with ship vessel crew members). In such situations, marine terminals and longshoring employers have installed physical barriers to protect their employees. For example, like in the construction industry, to protect workers in trailers, where employees come and go throughout the day, employers have installed physical barriers between workstations, in addition to implementing other controls such as conducting virtual meetings instead of meeting in person.

A number of control strategies have also been implemented by employers as part of a multilayered approach to infection control, such as requiring all employees to wear face coverings, establishing a policy for non-employee face coverings, and exchanging COVID-19 status and worker protection procedures and policies with vessel crew. Controls like this have also been implemented in indoor administrative and operations offices and common areas such as break rooms and trailers.

*Shipyards*

Shipyard employers manufacture, repair, maintain, and/or dismantle ships, boats, and vessels of all types. Employees in this industry have a wide range of jobs such as operations managers who oversee day-to-day operations at a shipyard, operating engineers (e.g., crane operators, dry dock operators), and trade and skilled production workers like pipefitters, electricians, steel workers, welders, fabricators, and plumbers. Shipyard workers work above and below the waterline, inside and outside docked vessels, or on vessels in dry dock. They also work in workshops on shore. In addition, these job sites have miscellaneous support staff including office workers, security guards, and administrative and clerical workers.

DRAFT

Shipyard employers have implemented a variety of physical distancing controls in many of their operations. For example, shipyard employers have required workers to wear electronic sensors that alert them when they are closer than 6 feet to another worker, and have used signage to remind workers to maintain physical distance at choke points where workers are forced to stand together (e.g., gangways, ladders, passageways, hoists and elevators, entrance and exit points, break areas). Also, like in other industries, shipyard employers have modified clock-in/clock-out procedures to prevent congregating near time clocks, rearranged workstations so that workers can stay at least 6 feet apart, staggered shifts to reduce the number of workers at the project site at one time, and limited the number of visitors and non-employees who may be admitted to the worksite. Shipyard employers have also altered work rules so that shift turnovers involve as few people as possible, used video calling rather than meeting in person, and implemented controls, such as marking 6-foot increments, to help workers maintain physical distance in common areas like break areas and tool rooms.

There are several reasons why, in certain situations, employees performing shipyard work may not be able to maintain 6 feet of distance at all times. For example, the constraints of vessel layout means that shipboard work often occurs in small, enclosed spaces. In addition, due to the exacting standards for vessel construction, quality inspectors may need to observe certain operations. Moreover, some hazardous activities performed on vessels require a safety observer (e.g., hot work such as welding or work in confined spaces where a hazardous atmosphere could occur). OSHA found that shipyard employers have nonetheless successfully implemented a variety of overlapping controls to prevent transmission of COVID-19 among employees.

For example, many employees have job functions that require them to be seated indoors at a computer terminal for shipyard operations work such as coordinating the loading and

DRAFT

offloading of ships, often for extended periods of time. Project offices and similar spaces may not be large enough to accommodate physical distancing, especially if project engineers and supervisors come and go throughout the day to coordinate with workers, clients, subcontractors, or other project stakeholders. In these situations, employers have installed barriers between workstations. In addition, some employers have limited occupancy in the trailer and required face coverings (along with other controls) as part of a multilayered approach to employee protection.

Additionally, workers may not be able to maintain physical distancing if multiple workers are needed to complete tasks in small or enclosed spaces. Employers have nonetheless instituted overlapping controls such as requiring face coverings, modifying the worksite to minimize the number of workers and the amount of time workers spend in the area to the extent possible, and scheduling additional time to complete work when adjacent tasks can be performed sequentially or with fewer people. Employers have also utilized portable exhaust ventilation systems or portable air cleaners with HEPA filters when possible to help clean the air when employees must work in physical proximity to co-workers.

Employers have also installed physical barriers to protect workers in situations where physical distancing is not feasible. For example, workers may not always be able to maintain 6 feet of distance from tool room attendants when picking up, returning, or having tools serviced. In these situations, employers have installed barriers between tool room attendants and workers. Also, as noted above, in many shipyards, employers have installed barriers between the workstations of employees who work at fixed computer terminals for a full shift in trailers or other temporary offices, or in operations command centers, while other administrative and managerial employees come and go to monitor shipyard operations.

DRAFT

*Agriculture*

Agricultural operations employ farmworkers, equipment operators, supervisors, and other workers who may need to work in physical proximity to each other. This sector includes both crop production (workers who plant, cultivate, and harvest vegetables, fruits, nuts, horticultural specialties, and field crops) and animal production (workers who attend to live farm, ranch, or open range animals).

Many agricultural operations occur outdoors in large fields and are already conducted in a physically distanced manner, or require relatively little modification, such as herd work or operating heavy equipment (such as tractors and combines), and OSHA has not identified feasibility barriers to the implementation of physical distancing controls with respect to these operations. OSHA identified a number of controls that have been implemented to help workers avoid physical proximity (working within 6 feet of another person) in cases where physical distancing might be more difficult. For example, during planting and harvesting, workers in adjacent rows of crops could come within 6 feet of one other, but some employers have adjusted their work processes to ensure the placement of workers within and between rows can be staggered and have also established requirements for employee face coverings. For inspection, sorting, and produce packing, changes to product flow can allow for fewer workers on the line, and tables and other equipment can be arranged so that workers are 6 feet apart and not facing each other. The size or weight of bins or items being lifted can also be reduced so they can be lifted by one worker. Pass-off points can be established where one worker carries something to one point and then leaves before another worker picks it up.

Agricultural operations can at times involve employees working in indoor enclosed spaces, such as greenhouses or storage areas where they may come within 6 feet of each other. In

DRAFT

these situations, OSHA found that some employers have installed barriers between employee work stations, and some have also implemented requirements for face coverings. They have also implemented other controls such as providing mechanical ventilation for work spaces.

*Summary of feasibility challenges for distancing and physical barriers*

While OSHA strongly emphasizes the use of physical distancing and physical barriers, it recognizes that there are a few situations where employers have found that it is not feasible to implement either or both. In manufacturing settings, for example, there are times when physical distancing is not feasible because equipment cannot be reconfigured and employees must move across spaces where barriers cannot be erected. In construction industries, tasks sometimes require at least two people, who cannot maintain physical distance from each other during the task, and the equipment or work prevents physical barriers from being erected. Similarly, for some drilling tasks in the upstream oil and gas industry, multiple employees are needed to safely complete some tasks, where physical distancing is not possible and physical barriers cannot be used because they could impede employee movement on the drilling platform and interfere with moving equipment across and around the platform. Physical distancing and physical barriers may also not be feasible during the conduct of Emergency Medical Services (EMS), to the extent it would not be possible to be physically distanced or use a physical barrier while treating a patient in the back of an ambulance, for example. Physical barriers may also be infeasible where they obstruct an emergency egress path or interfere with a facilities fire safety systems (e.g., fire alarm notification devices, fire sprinklers, fire pull stations).

OSHA emphasizes a multilayered approach for employers to protect their workers: physical distancing and, if necessary, physical barriers must be used in conjunction with other controls, such as face coverings, hand hygiene, and ventilation, and not as the sole means of

DRAFT

control. When confronting the rare situations where both physical distancing and physical barriers are not feasible, employers can still implement the remaining layers of overlapping controls, including face coverings, hand hygiene, and ventilation, required by the standard to reduce the risk of COVID-19 transmission.

Based on the evidence that physical distancing and physical barriers are already being implemented across a broad range of industries, OSHA concludes that it is feasible to implement the ETS's physical distancing and physical barrier requirements. In the few cases where physical distancing and physical barriers are both not feasible, work can be conducted to maintain as much distance as possible, and the additional controls such as face coverings, ventilation, and hygiene required by the ETS will still provide some measure of protection.

*Ventilation (General Section and Healthcare Section)*

Ventilation systems are another necessary part of a multilayered strategy to control transmission of COVID-19 (CDC, February 9, 2021). As will be discussed in more detail below, the ability of heating, ventilation, and air conditioning (HVAC) systems to reduce the risk of exposure depends on many factors, including design features, operation and maintenance practices, and the quality and quantity of outdoor air supplied to the space. Paragraph (h) of the general section and paragraph (k) of the healthcare section require employers who own or control buildings or structures with existing heating, ventilation, and air conditioning (HVAC) systems to ensure that: (1) each HVAC system is used in accordance with the HVAC manufacturer's instructions and its design-specifications; (2) either the amount of outside air supplied to the HVAC system is maximized to the extent appropriate and compatible with the system's capabilities (general section), or the amount of outside air circulated through its HVAC system and the number of air changes per hour (ACHs) are maximized to the extent appropriate

DRAFT

(healthcare section); (3) all air filters are rated Minimum Efficiency Reporting Value (MERV) 13 or higher, if compatible with the HVAC system (or, alternatively, rated at the highest compatible filtering efficiency); (4) all air filters are maintained and replaced as necessary; and (5) all outside air intake ports are clean, maintained, and cleared of any debris that may affect the function and performance of the HVAC system. The healthcare section also requires that where the employer has an existing airborne infection isolation room (AIIR), the employer must maintain and operate it in accordance with its design and construction criteria.

In the remainder of this section, OSHA discusses how employers can comply with these requirements and then draws its conclusion on technological feasibility.

*Using HVAC systems in accordance with manufacturer's instructions and design-specifications (general section and healthcare section)*

To meet the ETS's requirements, employers must verify that the system is functioning as designed. Because each building and its existing HVAC systems will be different, the employer might need to consult a professional engineer or HVAC specialist to determine the best way to maximize the system's ventilation and air filtration capabilities for each specific room in the building and thereby ensure the system is operating according to design specifications.

The American Society of Heating, Refrigeration and Air Conditioning Engineers (ASHRAE) Standard 180-2018 Standard Practice for Inspection and Maintenance of Commercial Building HVAC Systems provides guidance on preventive maintenance for HVAC systems, including checklists that employers can use to verify the system is operating as designed (ASHRAE, June 11, 2018). Additional guidance can be found in CDC's Interim Guidance for Businesses and Employers Responding to Coronavirus Disease 2019 (COVID-19) (CDC, March 1, 2021), and the ASHRAE Guidance for Re-Opening Buildings (ASHRAE,

DRAFT

October 5, 2020). Guidance for schools can be found in CDC's guidance for improving ventilation and increasing filtration in schools, the ASHRAE guidelines for schools and universities, and the ASHRAE guidance for the re-opening of schools (CDC, February 26, 2021; ASHRAE, July 22 , 2020; ASHRAE, August 20 , 2020).

Healthcare settings have additional HVAC design parameters for meeting specifications for directional airflow and relative pressure differentials. For example, according to ASHRAE's Standard 170 Ventilation of Health Care Facilities, ventilation systems that provide air movement from clean areas (e.g., nursing stations) to potentially contaminated areas (e.g., patient airborne infection isolation rooms) are recommended for preventing airborne transmission. Thus, the air pressure of the room or space would be maintained at a negative pressure relative to the hallways and surrounding spaces. This means that when the door is opened, potentially contaminated air or other dangerous particles from inside the room will not flow outside into non-contaminated areas. (ASHRAE, 2017). Normally functioning existing isolation rooms should already be able serve this function because Joint Commission accreditation and Center for Medicare and Medicaid Services (CMS) regulations have requirements for negative pressure airborne infection isolation rooms design.

Additionally, in laboratories in which live viruses are handled, HVAC systems are designed to even stricter parameters. CDC, in Biosafety and Microbiological and Biomedical Laboratories (BMBL) (CDC, 2009), recommends ventilation systems to ensure directional airflow, air treatment systems to decontaminate or remove agents from exhaust air, controlled access zones, airlocks at laboratory entrances, and separate buildings or modules to isolate the laboratory. The ASHRAE Laboratory Design Guide also contains design parameters for laboratories, including specific ventilation recommendations. Moreover, CDC guidelines

DRAFT

recommend additional precautions, depending on the level of containment needed, such as the use of either a certified Class II Biological Safety Cabinet (BSC) when working with samples or materials for diagnostic testing for COVID-19 or additional precautions to provide a barrier between the specimen and personnel. Also under these guidelines, the isolation in cell culture and initial characterization of viral agents recovered in cultures of SARS-CoV-2 specimens requires a Biosafety Level 3 (BSL-3) laboratory (CDC, 2009).[20]

*Using AIIRS in accordance with design and construction criteria (healthcare section)*

AIIRs are designed to prevent the transmission of airborne transmissible agents to areas outside a patient's room. These rooms have a high air exchange rate and are under negative air pressure, meaning that the room air has a slight negative pressure compared to the surrounding rooms. The high air exchange rate (at least 12 air changes per hour (ACH)) helps change the room air frequently and reduces (but does not eliminate) buildup of airborne disease agents, such as the virus that causes COVID-19. The negative air pressure differential (0.01 inch of water [2.5 Pa]) helps reduce the chance that the remaining airborne virus will exit the room door and contaminate air in adjacent hallways. An anteroom is a beneficial room feature that helps further isolate the AIIR from the adjacent hallway. When the AIIR has an anteroom, the AIIR's air pressure should be negative to the anteroom, while the anteroom air pressure should be negative

DRAFT

[20] BMBL contains four BSLs. BSL-1 is suitable for work involving well-characterized agents not known to consistently cause disease in immunocompetent adult humans, and that present minimal potential hazard to laboratory personnel and the environment. BSL-2 is recommended where work is done with the broad spectrum of indigenous moderate-risk agents that are present in the community and associated with human disease of varying severity. BSL-3 is recommended for work that is done with indigenous or exotic agents with a potential for respiratory transmission, and which may cause serious and potentially lethal infection. BSL-4 is recommended for work with dangerous and exotic agents that pose a high individual risk of life-threatening disease, which may be transmitted via the aerosol route and for which there is no available vaccine or therapy.

to the adjacent hallway. This arrangement means air from the hallway will flow into the anteroom each time the door is opened, and air from the anteroom will flow into the AIIR – minimizing the amount of airborne disease agents (virus) that exits the room. ASHRAE Standard 170, Ventilation of Health Care Facilities offers detailed guidance for designing and operating AIIRs (ASHRAE, 2017).

*Maximizing outside air supplied to HVAC system(s) to the extent appropriate and compatible with the HVAC system's capabilities (general section)*

Building HVAC systems are designed to draw in a certain amount of outdoor air into the building to maintain indoor air quality. By introducing fresh air into the building, HVAC systems can prevent the buildup of airborne contaminants through dilution.

The introduction of outdoor air into the building can also help limit the potential for the virus that causes COVID-19 to accumulate in the building. The more outdoor air the HVAC system is capable of drawing into the building, the greater the impact may be on limiting the potential for the virus to accumulate. Maximizing the amount of outdoor air introduced to the system can be achieved by fully opening the building's outdoor air intake dampers; however, this may introduce other indoor air quality or comfort concerns resulting from humidity, temperature extremes, or outdoor pollution. Employers should work with building managers or HVAC professionals to adjust the HVAC system to bring in as much outdoor air as possible, while taking into consideration outdoor pollution levels and ensuring that the HVAC system is capable of maintaining building temperature and humidity levels within acceptable occupant comfort ranges. OSHA notes that it does not expect employers to reconfigure duct work to comply with this provision. When maximizing the outside air, employers should take into account not to

DRAFT

draw in air from potential pollution sources such as smoking areas, loading docks, vehicle traffic areas, or active construction zones, or air being re-entrained from the building exhaust itself.

Balancing refers to the process of measuring the air flow through the supply ducts and adjusting the dampers to provide an even distribution of air through the HVAC system duct work and supply vents. According to ASHRAE Standard 111 Measurement, Testing, Adjusting, and Balancing of Building HVAC Systems, testing and balancing an HVAC system provides the means to determine and monitor system performance. Proper balancing ensures that outdoor air brought into the building will be evenly supplied to all areas of the building and limit the potential for ventilation dead zones or stagnant air to accumulate (ASHRAE, October 31, 2017).

*Maximizing the amount of outside air circulated through HVAC system(s) and the number of air changes per hour (ACHs) to the extent appropriate (healthcare section)*

In addition to considering the factors discussed above with respect to maximizing outside air, employers subject to the healthcare section must also consider how to maximize ACHs. ACHs are a measure of the air volume that is added to or removed from a space in one hour divided by the volume of the space. The more frequently the air within that space is replaced per hour, or the more ACHs, the more the overall potential concentration of COVID-19 in the work environment will be reduced. Building owner/operators or employers can seek assistance from HVAC professionals on maximizing ACHs based on the workspace and the design capabilities of the HVAC system(s) (ASHRAE, 2017).

*Using air filters rated MERV 13 or higher, if compatible with the HVAC system(s), or, alternatively, to the highest compatible filtering efficiency (general section and healthcare section)*

DRAFT

Building HVAC systems are equipped with air filters that remove particles from recirculated air streams before returning the air to occupied spaces. Air filters are available in a variety of materials such as pleated paper, cloth, woven fiberglass, and polyester. A filter's efficiency is measured by the fraction of particles the filter is able to remove from the air stream. The higher the filter's efficiency the better it is at removing particles from the air. There are several systems for rating filter efficiencies. The most common is the MERV rating system, which was developed by ASHRAE.

Many existing HVAC systems are designed and installed to operate with filters ranging from MERV 6 to MERV 8. MERV 8 filters are only about 20 percent efficient in removing particles in the 1 µm to 3 µm size range (the size range of concern for aerosol droplets containing the virus that causes COVID-19). Employers and building managers can improve this efficiency by upgrading to MERV 13 or higher filters, to the extent those filters are compatible with their systems. MERV 13 filters are at least 85 percent efficient at capturing particles in the 1 µm to 3 µm size range. Increasing filter efficiency, however, can increase pressure drop across the filters leading to increased fan energy use, reduced airflow rates, and or/issues controlling indoor temperature and humidity levels. As a result, employers and building owners may need to consult an HVAC professional to optimize filter efficiency consistent with their HVAC system's capabilities.

DRAFT

*Maintaining and replacing all air filters as necessary (general section and healthcare section)*

The required frequency for changing filters will vary depending on the characteristics of the HVAC system, and therefore the ETS does not specify a frequency for filter changing.

*Ensuring all outside air intake ports are clean, maintained, and cleared of any debris that may affect the function and performance of the HVAC system(s) (general section and healthcare section)*

To comply with this provision, a visual inspection of the outside air intakes, which can be accomplished as part of a routine maintenance program, is required.

*Additional Ventilation Measures (general section and healthcare section)*

Notes to the ETS's ventilation requirements in the general and healthcare sections provide that, in addition to the requirements for existing HVAC systems (and AIIRs in the healthcare section), all employers should also consider other measures to improve ventilation in accordance with CDC guidance. Below are some additional measures that an employer should consider to increase total airflow supply to occupied spaces:

- Disabling demand-control ventilation (DCV) controls that reduce air-supply based on temperature or occupancy;
- Using natural ventilation (i.e., opening windows if possible and safe to do so) to increase outdoor air dilution of indoor air when environmental conditions and building requirements allow;
- Running the HVAC system at maximum outside airflow for 2 hours before and after occupied times.
- Generating clean-to-less-clean air movements, re-evaluating the positioning of supply and exhaust air diffusers and/or dampers, and adjusting zone supply and exhaust flow rates to establish measurable pressure differentials;

DRAFT

- Requiring that staff work in "clean" ventilation zones and not in higher-risk areas (e.g., visitor reception or exercise facilities (if open)) to the extent feasible;
- Using portable high-efficiency particulate air (HEPA) fan/filtration systems to help enhance air cleaning especially in higher-risk areas; and
- Ensuring exhaust fans in restroom facilities are functional and operating at full capacity when the building is occupied.

The terms of the ETS make clear that there are no technological hurdles to compliance with its ventilation requirements. First, the ventilation requirements apply only to existing systems. Notes in the general and healthcare sections emphasize that the requirements do not require installation of new HVAC systems (or AIIRS, in the healthcare section) to replace or augment functioning systems. Therefore, the ventilation requirements do not raise the questions of feasibility typically associated with employers needing to install new engineering controls to come into compliance with a new standard.

Second, the HVAC requirements apply only to employers who own or control buildings or structures. Thus, for example, the requirements do not apply to employers who lease space and do not control the building or structure, and the ETS does not raise questions as to how these employers would comply with the ventilation requirements.

Third, employers covered by the general section are required only to ensure that HVAC systems operate with a sufficient filter (MERV-13 where possible) in accordance with manufacturer's instructions and design specifications, and only in a manner that is appropriate for the system using methods that are compatible with the system, and, in the healthcare section, that AIIRs are maintained and operated in accordance with their design and construction criteria. As such employers are not required by the ETS to modify their HVAC systems or AIIRs in any

DRAFT

manner, only to ensure that they are operating as designed, which negates questions as to how the employer would make modifications.

Fourth, a number of the plans, best practice documents, and scenarios discussed above reference HVAC systems and ventilation. The use of HVAC systems to manage building air filtration and circulation of fresh air as part of overlapping controls to address the COVID-19 hazard illustrate that there is no technological feasibility barrier to compliance with the ETS's ventilation requirements in typical firms in all affected industries. The ETS's filter requirements are inherently technologically feasible because they only require the installation of the maximum filter that is compatible with the applicable HVAC system.

The design and complexity of HVAC systems can vary widely depending on a range of factors including the use, size, and age of the building, and, as discussed, deciding on the maximum appropriate amount of outside air to supply to the HVAC system(s) (and, if applicable, the ACHs) can be a complex task. However, larger buildings have dedicated facilities management staff who are responsible for regular ventilation system maintenance and adjustment and will have the prerequisite experience to evaluate the capabilities of the HVAC system, while in other cases, employers may need to consult with an HVAC professional to ensure that facilities HVAC is functioning in accordance with the HVAC manufacturer's instructions and the design specifications of the HVAC system(s). Based on these factors, OSHA concludes that there are no technological barriers to compliance with the ETS's ventilation requirements.

*Implementation of Good Infection Control Practices and Recognized Good Biosafety Practices in Healthcare and Related Industries*

DRAFT

The healthcare section of the ETS applies to all settings where any employee provides healthcare services; performs healthcare support services; handles contaminated materials; handles human remains; or conducts biomedical laboratory operations. As noted previously, the healthcare section of the ETS contains many provisions that are identical or similar to the general section of the ETS: a COVID-19 plan, physical distancing, physical barriers, cleaning and disinfection, ventilation, health screening, and notification. As discussed below, CDC guidance also contains many of the same provisions and are already being in implemented in healthcare settings. Also, there are many settings in the healthcare sector that are similar to those in the general sectors. For example, receptionists, administrative and clerical employees, and general office workers covered by both the general and healthcare sections share the same exposure concerns in their daily work activities. For these job categories, employers have implemented similar controls to minimize exposure risk, including physical distancing, physical barriers, face coverings, cleaning and disinfection and hand hygiene.

As with other industry sectors, OSHA reviewed a number of existing plans prepared by hospitals other healthcare providers and found that many employers in the healthcare sector have implemented a multilayered approach to protect their workers from COVID-19. (Cambridge Health Alliance, 2021; Johns Hopkins Medicine, 2021; HCA Healthcare, 2021; Dignity Healthcare, 2021). With respect to physical distancing, hospital employers have reduced and restricted occupancy at facilities. For example, employers have implemented staggered shifts for employees, as well as teleworking arrangements, to help reduce occupancy and ensure physical distancing. Employers have also expanded remote telemedicine consultations so fewer patients with non-emergency conditions need to attend hospitals and other facilities where patient care occurs to receive medical care. In this respect, where video conferencing systems cannot be

DRAFT

used, employers have used other virtual options, such as online secured patient portals with chat and messaging features, to reduce the occupancy of healthcare facilities. Employers have also implemented telephone triage systems, and, in this way, patients identified as low risk for Covid-19 can be cared for virtually, if appropriate, while patients identified as higher risk for COVID-19 can be routed to the appropriate care. In addition, employers have reduced or completely eliminated patient visiting hours for those patients with suspected or confirmed COVID-19. Finally, employers have installed floor markings as visual cues to stay six feet apart throughout the facility, including common areas such as waiting rooms and cafeterias, spaced public seating six feet apart, and limited the number of people in a space, whenever possible.

OSHA's review of a number of the hospital plans cited earlier indicates that physical barriers have been installed by healthcare employers to protect their workers when physical distancing may not be possible at all times. For example, similar to the settings covered by the general section, some hospitals have installed physical barriers at checkpoints to protect security guards, as well as reception desks and patient/visitor information counters to protect the employees working there from proximity with patients, visitors, and other healthcare workers. Therefore, OSHA finds no evidence to indicate that any of these requirements would be more difficult to apply in healthcare, laboratory, or deathcare (e.g. involving the handling of human remains in funeral homes, etc.) settings than in the general section settings described earlier in this assessment.

In addition to requiring physical distancing, physical barriers (where physical distancing is not feasible) in non-patient care areas, ventilation, and other controls, the healthcare section contains four provisions specific to healthcare, laboratories, and deathcare, each of which is

DRAFT

discussed in detail in the Need for Specific Provisions and Summary and Explanation sections of the Preamble.

*§ 1910.502(d) - Patient screening and management.* The purpose of this provision is to limit contact with potentially infectious persons by, for example, requiring screening and triage of everyone entering a healthcare setting and limiting and monitoring points of entry to the setting.

*§ 1910.502 (e) - Standard and transmission-based precautions/Recognized good biosafety practices.* The healthcare section requires that, in settings where healthcare services, healthcare support services, or mortuary services are provided, the employer must develop and implement policies and procedures to adhere to Standard and Transmission-Based Precautions, and that in settings where biomedical laboratory operations are conducted, the employer must develop and implement policies and procedures to adhere to recognized good biosafety practices. Standard and Transmission-Based Precautions and recognized good biosafety practices are established and commonly used practices for reducing the risk of transmission of infectious agents such as COVID-19.

*§ 1910.502(f) - Personal protective equipment.* The healthcare section requires employers to provide and ensure employees use facemasks or respirators in specified situations, and also requires the use of other PPE, such as gloves and eye protection, in appropriate circumstances.

*§ 1910.502(g) - Aerosol-generating procedures on a person with suspected or confirmed COVID-19***.** Because aerosol-generating procedures are well known to be high risk activities for exposure to respiratory infections such as COVID-19, the healthcare section contains special requirements to address this hazard. For example, the employer must limit the number of

DRAFT

employees present during the procedure to only those essential for patient care and procedure support.

The settings covered by the healthcare section of the ETS are listed in Table 4.

| **Table 4: Settings covered by Healthcare Section of the ETS** | |
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| Settings Covered | Examples of Facility Types |
| Hospitals – facilities with workers who provide inpatient healthcare services and healthcare support services. | General hospitals<br>Trauma centers<br>Specialty hospitals<br>(children's, cardiac, etc.)<br>Teaching hospitals<br>Emergency departments attached to a hospital |
| Ambulatory Care – facilities with workers who provide outpatient care to patients. | Physician offices<br>Dentist offices<br>Surgical centers<br>Specialty care clinics Urgent care centers<br>Oncology clinics<br>Medical clinics |
| Laboratories – facilities with workers who are engaged in biomedical laboratory operations. | Diagnostic laboratories<br>Diagnostic imaging centers<br>Research laboratories<br>Production laboratories |
| Home Health Care – facilities with workers who provide healthcare and healthcare support services in the home. | Hospice agencies<br>Home therapy agencies<br>Home healthcare agencies |
| Emergency Responders and Prehospital Care – facilities with workers who respond to emergency calls, perform healthcare services and/or transport patients to medical facilities. | Fire Departments<br>Ambulance companies<br>Medical transportation services<br>Air evacuation companies |
| Death Care – facilities with workers who prepare or handle dead bodies. | Funeral homes Crematoriums<br>Coroner's offices<br>Morgues<br>Autopsy Suites<br>Forensic Laboratories<br>Medical teaching facilities that use cadavers |
| Long Term Care – facilities where workers provide care and support services in a residential setting. | Skilled nursing centers<br>Residential substance abuse centers<br>Residential psychiatric centers<br>Residential rehabilitation centers |
| Laundry Service – facilities with workers who launder items from | Uniform supply companies<br>Linen supply companies<br>Commercial laundries |

DRAFT

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| facilities that provide healthcare services. | |
| Medical Equipment Servicing – facilities with workers who repair and reprocess equipment used by facilities that provide healthcare services. | Diagnostic equipment repair companies<br>Wheelchair repair companies<br>Equipment re-processors<br>Medical device reprocessing companies<br>Medical equipment servicing companies |
| Medical Waste – facilities with workers who handle and treat waste generated from facilities that provide healthcare services or biomedical laboratory facilities. | Autoclave operations<br>Waste incinerator operations<br>Waste collection services |

To support its assessment of the technological feasibility of the healthcare section, OSHA reviewed evidence that shows that the good infection control practices or recognized good biosafety practices identified in § 1910.502(d) through (g) are commonly implemented by employers who have employees in settings listed in Table 4. This evidence includes: CDC infection control or biosafety guidance documents, many of which are COVID-19 specific; regulations issued by the Center for Medicare and Medicaid Services (CMS); and accreditation of these settings by The Joint Commission; and OSHA's Bloodborne Pathogens (BBP) Standard, 29 CFR 1910.1030. For example, § 1910.502(e)(1) requires compliance with the CDC's Standard and Transmission-Based Precautions. As detailed below, OSHA can show that this is technologically feasible by demonstrating that at least some hospitals and other healthcare settings follow these precautions (thereby it is capable of being done and can be implemented in other healthcare settings).

To demonstrate that, OSHA points to two reasons why healthcare employers comply with these precautions. First, OSHA's BBP standard already requires hospitals and other healthcare and healthcare-related facilities to implement a parallel framework, often with similar systems and controls, to comply with many of the same precautions. Even where the requirements for some controls must be implemented somewhat differently under this ETS than under the BBP

DRAFT

standard, OSHA is not aware of technological feasibility challenges that arise from these differences. For example, a hospital's COVID-19 plan will be different from its BBP Exposure Plan, but the planning process will already be familiar to the hospital and there should be enough similarities in the construction of plans identifying and addressing hazards that there will not be any feasibility issues with formulating the COVID-19 plan.

Second, healthcare employers must have an infection control program that includes Standard and Transmission-Based Precautions to be eligible for certain government funds (CMS distribution of Medicare and Medicaid funds) or accreditation (The Joint Commission). CMS regulations only cover providers that accept or collect payments from Medicare or Medicaid. Compliance with the CMS regulations is generally validated through periodic accreditation surveys of facilities by CMS-approved accreditation organizations, including The Joint Commission, state survey agencies, and other accrediting organizations (e.g., Accreditation Association for Ambulatory Health Care (AAAHC)). CMS and The Joint Commission reliance on largely the same criteria as this ETS means that the technological feasibility of the ETS is supported by those hospitals and other healthcare settings who do have to comply by proving that the requirements are capable of being done.[21]

*CDC Infection Control and Biosafety Guidance Documents*

The CDC has issued infection control and biosafety guidance, listed in Table 5, that apply to the following settings and industry groups: hospitals and ambulatory care settings,

[21] OSHA notes that its assessment in this section addresses only whether the ETS is technologically feasible. The fact that many health care facilities have already implemented some version of the controls required by the ETS does not mean that there is no need for the ETS to apply to healthcare. Again, CMS regulations only cover providers that accept or collect payments from Medicare or Medicaid. In addition, OSHA has in place enforcement mechanisms that CMS does not have and that would work in concert with CMS to achieve a greater level of compliance. For example, OSHA can respond to complaints, conduct random unannounced inspections, and conduct worksite inspections in response to complaints filed by workers. As described elsewhere in this preamble, the ETS is necessary to address the grave danger posed by COVID-19. See *Rationale for the ETS, Grave Danger* and *Need for the ETS* (Section IV of the preamble).

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laboratories, plasma and blood collection facilities and dialysis facilities, home health care, emergency responders and prehospital care, long term care, death care, laundry services, medical equipment and medical waste, and dental and oral care. These guidelines provide infection-control and biosafety recommendations for use in the settings covered by the healthcare section of the ETS (listed in Table 4). The guidance provides recommendations for implementing policies and practices to minimize the risk of exposure to respiratory pathogens, and many are recently issued guidelines specific to COVID-19.

**Table 5: CDC Guidance Documents for COVID-19 and General Infection Control**

Hospitals and Ambulatory Care

1. Interim Infection Prevention and Control Recommendations for Healthcare Personnel During the Coronavirus Disease 2019 (COVID-19) Pandemic (February 10, 2021)
2. Interim U.S. Guidance for Risk Assessment and Work Restrictions for Healthcare Personnel with Potential Exposure to SARS-CoV-2 (February 19, 2021)
3. Interim Clinical Guidance for Management of Patients with Confirmed Coronavirus Disease (COVID-19) (February 16, 2021)
4. Considerations for Alternate Care Sites: Infection Prevention and Control Considerations for Alternate Care Sites (April 24, 2020)
5. Healthcare Facilities: Managing Operations During the COVID-19 Pandemic (December 22, 2020)
6. Interim Guidelines for Collecting, Handling, and Testing Clinical Specimens from Persons for Coronavirus Disease 2019 (COVID-19) (February 17, 2021)
7. Infection Control in Healthcare Personnel: Infrastructure and Routine Practices for Occupational Infection Prevention and Control Services (October 28, 2019)
8. Core Infection Prevention and Control Practices for Safe Healthcare Delivery in All Settings – Recommendations of the Healthcare Infection Control Practices Advisory Committee (HICPAC) (December 27, 2018)
9. Guideline for Isolation Precautions: Preventing Transmission of Infectious Agents in Healthcare Settings Siegel JD, Rhinehart E, Jackson M, Chiarello L, and the Healthcare Infection Control Practices Advisory Committee, 2007 (July 22, 2019)
10. Using Personal Protective Equipment (PPE) (August 19, 2020)
11. Hand Hygiene Recommendations, Guidance for Healthcare Providers about Hand Hygiene and COVID-19 (May 17, 2020)

DRAFT

12. Guidance for Pharmacies, Guidance for Pharmacists and Pharmacy Technicians in Community Pharmacies during the COVID-19 Response (November 13, 2020)

13. Post Vaccine Considerations for Healthcare Personnel, Infection Prevention and Control Considerations for Healthcare Personnel with Systemic Signs and Symptoms Following COVID-19 Vaccination (December 13, 2020)

14. Guide to Infection Prevention for Outpatient Settings: Minimum Expectations for Safe Care (September 2016)

15. Using Telehealth to Expand Access to Essential Health Services during the COVID-19 Pandemic (June 10, 2020)

Biomedical Laboratories

16. Interim Laboratory Biosafety Guidelines for Handling and Processing Specimens Associated with Coronavirus Disease 2019 (COVID-19) (January 6, 2021a)

17. Interim Guidelines for Collecting, Handling, and Testing Clinical Specimens from Persons for Coronavirus Disease 2019 (COVID-19) (January 6, 2021b)

18. Biosafety in Microbiological and Biomedical Laboratories, 5th Edition, HHS Publication No. (CDC) 21-11122009 (October 24, 2018; 6th Edition (Meechan and Potts, June 2020); webpage last reviewed November 17, 2020)

19. Guidelines for Safe Work Practices in Human and Animal Medical Diagnostic Laboratories, MMWR 2012; 61(01);1-101 (January 6, 2012)

20. Guidance for General Laboratory Safety Practices during the COVID-19 Pandemic (August 24, 2020)

Plasma and Blood Collection Facilities and Dialysis Facilities

21. Interim Additional Guidance for Infection Prevention and Control Recommendations for Patients with Suspected or Confirmed COVID-19 in Outpatient Hemodialysis Facilities (December 17, 2020)

22. Guidance for Blood and Plasma Facilities, Interim Infection Control Guidance on COVID-19 for Personnel at Blood and Plasma Collection Facilities (April 29, 2020)

Home Health Care

23. Guidance for Direct Service Providers (December 16, 2020)

24. Interim Guidance for Implementing Home Care of People Not Requiring Hospitalization for Coronavirus Disease 2019 (COVID-19) (October 16, 2020)

25. Interim Infection Control Guidance for Public Health Personnel Evaluating Persons Under Investigation (PUIs) and Asymptomatic Close Contacts of Confirmed Cases at Their Home or Non-Home Residential Settings (April 10, 2020)

Emergency Responders and Prehospital Care

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26. Interim Recommendations for Emergency Medical Services (EMS) Systems and 911 Public Safety Answering Points/Emergency Communication Centers (PSAP/ECCs) in the United States During the Coronavirus Disease (COVID-19) Pandemic (July 15, 2020)

27. What Firefighters and EMS Providers Need to Know about COVID-19 (Nov 6, 2020)

Death Care

28. Collection and Submission of Postmortem Specimens from Deceased Persons with Confirmed or Suspected COVID-19, Postmortem Guidance (December 2, 2020)

29. What do funeral home workers need to know about handling decedents who had COVID-19 (November 10, 2020)

Long Term Care

30. Interim Additional Guidance for Infection Prevention and Control for Patients with Suspected or Confirmed COVID-19 in Nursing Homes (March 21, 2020). Preparing for COVID-19 in Nursing Homes (November 20, 2020)

31. Responding to Coronavirus (COVID-19) in Nursing Homes, Considerations for the Public Health Response to COVID-19 in Nursing Homes (April 30, 2020)

32. Infection Prevention and Control Assessment Tool for Nursing Homes Preparing for COVID-19 (January 22, 2021)

33. Nursing Homes and Assisted Living (Long-Term Care Facilities [LTCFs]) Infection Prevention Tools (May 28, 2020)

34. Considerations for Preventing Spread of COVID-19 in Assisted Living Facilities (May 29, 2020)

35. Considerations for Memory Care Units in Long-term Care Facilities (May 12, 2020)

Laundry Services, Medical Equipment and Medical Waste

36. Environmental Infection Control Guidelines: Guidelines for Environmental Infection Control in Health-Care Facilities (July 23, 2019)

37. Clinical Questions about COVID-19: Questions and Answers – Waste Management (February 22, 2021)

Dental and Oral Care

38. Guidance for Dental Settings: Interim Infection Prevention and Control Guidance for Dental Settings During the Coronavirus Disease 2019 (COVID-19) Pandemic, (December 4, 2020)

39. Summary of Infection Prevention Practices in Dental Settings: Basic Expectations for Safe Care (April 28, 2020)

DRAFT

The CDC guidelines in Table 5 are commonly implemented, longstanding, and essential elements of infection control in healthcare and related industries (i.e., the settings listed in Table 4), evidenced by the CDC's 2007 Guideline for Isolation Precautions: Preventing Transmission of Infectious Agents in Healthcare Settings (Item 9 in Table 5, above), which incorporates Standard and Transmission-Based Precautions into its recommendations. This 2007 Guideline updated 1996 guidelines, which introduced the concept of Standard Precautions, and also noted the existence of infection control recommendations dating back to 1970.

Similarly, recognized good biosafety practices in settings where biomedical laboratory operations are conducted are also well established and essential aspects of infection control. For example, the "Biosafety in Microbiological and Biomedical Laboratories" (BMBL, Item 18 in Table 5, above), which was developed through the contributions of over 200 scientists and professionals who participated in technical working groups and served as reviewers, guest editors, and subject matter experts, has served as the cornerstone of biosafety practice in the United States since its initial release.

The implementation of the CDC guidelines is also evidenced by regulations issued by the Center for Medicare and Medicaid Services (CMS) regulation that apply to settings in Table 4 and the accreditation of settings in Table 4 by The Joint Commission, as described below.

OSHA notes that guidelines that are grouped with one setting in Table 5 may apply to other settings as well. For example, the Interim Infection Prevention and Control Recommendations for Healthcare Personnel During the Coronavirus Disease 2019 (COVID-19) Pandemic (Item 1 in Table 5) applies to Emergency Medical Personnel, Home Health Care, Long Term Care, Laundry Services, Medical Equipment Servicing, and Medical Waste, in addition to applying to Hospitals and Ambulatory Care. In fact, the guidance provides recommendations on

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laundry, medical waste, and medical equipment in addition to providing recommendations for HCP providing direct patient care.[22]

OSHA also notes that some guidelines in Table 5 may rely on other guidelines in Table 5. For example, Clinical Question about COVID-19: Question and Answers (Item 37 in Table 5) provides that medical waste coming from healthcare facilities treating COVID-2019 patients is handled no differently than waste coming from facilities without COVID-19 patients, and links to the Interim Infection Prevention and Control Recommendations for Healthcare Personnel During the Coronavirus Disease 2019 (COVID-19) Pandemic (Item 1 in Table 5), which states that management of laundry, food service utensils, and medical waste should be performed in accordance with routine procedures.

*CMS Regulations that Condition Participation in Medicare and Medicaid on Implementation of Nationally Recognized Infection Control Guidelines*

The Center for Medicare and Medicaid Services (CMS) administers healthcare programs for the elderly (Medicare) and needs-based state programs that help with medical costs (Medicaid). As a condition for participation in Medicare or Medicaid, medical providers must comply with regulations issued by the Department of Health and Human Services (DHHS), 42 CFR-Public Health. A number of these regulations, which apply to a broad spectrum of the

DRAFT

[22] The guidance is applicable to all U.S. settings where healthcare is delivered, and defines "healthcare setting" as places where healthcare is delivered. According to the guidance, this includes acute care facilities, long term acute care facilities, inpatient rehabilitation facilities, nursing homes and assisted living facilities, home healthcare, vehicles where healthcare is delivered (e.g., mobile clinics), and outpatient facilities, such as dialysis centers, physician offices, and others." Moreover, the guidance defines "healthcare personnel," or HCP, as all paid and unpaid persons serving in healthcare settings who have the potential for direct or indirect exposure to patients or infectious materials, including body substances (e.g., blood, tissue, and specific body fluids); contaminated medical supplies, devices, and equipment; contaminated environmental surfaces; or contaminated air. According to the guidance, HCP include emergency medical service personnel, nurses, nursing assistants, home healthcare personnel, physicians, technicians, therapists, phlebotomists, pharmacists, students and trainees, contractual staff not employed by the healthcare facility, and persons not directly involved in patient care, but who could be exposed to infectious agents that can be transmitted in the healthcare setting (e.g., clerical, dietary, environmental services, laundry, security, engineering and facilities management, administrative, billing, and volunteer personnel).

settings listed in Table 4, condition participation in Medicare and Medicaid on the implementation of nationally recognized infection control practices like the CDC guidelines listed in Table 5. The CMS regulations are summarized in Table 6.

**Table 6: CMS Regulations by Healthcare Setting**

| Healthcare Setting | Summary of Requirements for Implementation of Nationally Recognized Guidelines for Infection Control |
|---|---|
| Hospitals | CMS Regulation, Hospitals. The hospital must have an active hospital-wide program for the surveillance, prevention, and control of Healthcare-Associated Infections (HAIs) and other infectious diseases. The program must demonstrate adherence to nationally recognized infection prevention and control guidelines, and for reducing the development and transmission of HAIs and antibiotic-resistant organisms. (42 CFR 482.42).<br><br>CMS Regulation, Critical Access Hospitals (CAHs). The CAH must have active facility-wide programs, for the surveillance, prevention, and control of HAIs and other infectious diseases and for the optimization of antibiotic use through stewardship. The programs must demonstrate adherence to nationally recognized infection prevention and control guidelines, and for reducing the development and transmission of HAIs and antibiotic-resistant organisms. 42 CFR 485.640 |
| Ambulatory Care | CMS Regulation, Ambulatory Surgical Centers (ASCs). The ASC must maintain an ongoing program designed to prevent, control, and investigate infections and communicable diseases. In addition, the infection control and prevention program must include documentation that the ASC has considered, selected, and implemented nationally recognized infection control guidelines. (42 CFR 416.51)<br><br>CMS Regulation, Comprehensive Outpatient Rehabilitation Facilities. The facility must maintain a sanitary environment and establish a program to identify, investigate, prevent, and control the cause of patient infections. The facility must establish written policies and procedures designed to control and prevent infection in the facility and to investigate and identify possible causes of infection. The facility must monitor the infection control program to ensure that the staff implement the policies and procedures and that the policies and procedures are consistent with current practices in the field. (42 CFR 485.62).<br><br>CMS Regulation, Clinics, Rehabilitation Agencies, and Public Health Agencies as Providers of Outpatient Physical Therapy and Speech-Language Pathology Services. The organization that provides outpatient physical therapy services establishes an infection-control committee of representative professional staff with responsibility for overall infection control. The infection-control committee establishes policies and procedures for investigating, controlling, and preventing infections in the organization and monitors staff performance to ensure that the policies and procedures are executed. (42 CFR 485.725). |

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| Home Health Care | CMS Regulation, Home Health Agencies (HHAs). The HHA must maintain and document an infection control program which has as its goal the prevention and control of infections and communicable diseases. The HHA must follow accepted standards of practice, including the use of standard precautions, to prevent the transmission of infections and communicable diseases. The HHA must maintain a coordinated agency-wide program for the surveillance, identification, prevention, control, and investigation of infectious and communicable diseases. (42 CFR 484.70). |
| Long Term Care | CMS Regulations, Long Term Care Facilities. The facility must establish an infection prevention and control program (IPCP) that must include a system for preventing, identifying, reporting, investigating, and controlling infections and communicable diseases for all residents, staff, volunteers, visitors, and other individuals providing services under a contractual arrangement and following accepted national standards. (42 CFR 483.80).<br><br>CMS Regulations, Hospice Care. The hospice must maintain and document an effective infection control program that protects patients, families, visitors, and hospice personnel by preventing and controlling infections and communicable diseases. The hospice must follow accepted standards of practice to prevent the transmission of infections and communicable diseases, including the use of standard precautions. The hospice must maintain a coordinated agency-wide program for the surveillance, identification, prevention, control, and investigation of infectious and communicable diseases. (42 CFR 418.60). In addition, a hospice that provides inpatient care directly must: maintain an infection control program that protects patients, staff and others by preventing and controlling infections and communicable disease as stipulated in 42 CFR 418.60; provide a sanitary environment by following current standards of practice, including nationally recognized infection control precautions; and avoid sources and transmission of infections and communicable diseases. (42 CFR 418.110). |

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*Accreditation by The Joint Commission*

Founded in 1951, The Joint Commission is an independent, not for profit organization that accredits and certifies more than 22,000 health care organizations and programs in the United States (The Joint Commission, 2021a). Joint Commission accreditation and certification is recognized nationwide as a symbol of quality that reflects an organization's commitment to meeting certain performance standards. Joint Commission standards are the basis of an objective evaluation process that can help health care organizations measure, assess and improve performance. The standards focus on important patient, individual, or resident care and organization functions that are essential to providing safe, high quality care (The Joint

Commission, 2021b). To maintain accreditation, organizations undergo an on-site survey by a Joint Commission survey team at least every three years (laboratories are surveyed every two years). In these surveys, The Joint Commission monitors compliance with its standards for the implementation of good infection control and biosafety practices (including, for example, adherence to Standard and Transmission-Based Precautions, as recommended by the CDC Guidelines in Table 5) (The Joint Commission, 2021c). The Joint Commission offers accreditation for the following settings (many of which are contained in Table 4) (The Joint Commission, 2021c):

- Ambulatory care facilities;
- Critical access hospitals;
- Behavioral health care;
- Hospitals;
- Home care services;
- Laboratory services;
- Nursing care centers; and
- Office based surgery centers.

DRAFT

*OSHA's Bloodborne Pathogens Standard, 29 CFR 1910.1030*

Employers subject to the healthcare section have also been subject to requirements in the Bloodborne Pathogens (BBP) standard for 30 years, since it was promulgated in 1991. As the BBP standard was promulgated, OSHA found "with respect to the technological feasibility of the standard that its provisions permit practical means to reduce the risk now faced by those

employees working with blood and other infectious materials and that there do not appear to be any major obstacles to implementing the rule." (56 FR 64004, 64039 (Dec. 6, 1991)). OSHA's finding of technological feasibility during the BBP standard rulemaking is additional evidence that there are no technological feasibility barriers to complying with the healthcare section.

For example, Standard Precautions, which are required by the healthcare section, are similar to, but more extensive than, "Universal Precautions", which are required by the BBP standard to prevent contact with blood or other potentially infectious materials (see definitions in the BBP standard). The BBP standard defines "Universal Precautions" as an approach to infection control wherein all human blood and certain human body fluids are treated as if known to be infectious for HIV, HBV, and other bloodborne pathogens. Standard Precautions were developed to integrate principles of Universal Precautions into broader principles pertaining to routes of exposure other than the bloodborne route, such as via the contact, droplet, or airborne routes. For example, although the BBP standard might not apply, Standard Precautions would be utilized when workers are exposed to urine, feces, nasal secretions, sputum, vomit, and other body fluids, and also when workers are exposed to mucous membranes and non-intact skin. Using Standard Precautions when there is exposure to these materials, it should be assumed that the materials potentially contain infectious agents that could be transmitted via the contact, droplet, or airborne routes. Standard Precautions not only include the infection control methods specified as Universal Precautions (e.g., hand hygiene, the use of certain types of PPE based on anticipated exposure, safe injection practices, and safe management of contaminated equipment and other items in the patient environment), but also include, for example, respiratory and cough etiquette. The respiratory and cough etiquette and other additional controls for Standard Precautions are minor expansions on the Universal Precautions already applicable to most

DRAFT

healthcare facilities, and OSHA is not aware of any technological barriers for employers subject to the healthcare section.

It is important to emphasize that the BBP standard applies, not only during the provision of direct patient care, but also to healthcare-related activities, such as handling laundry, medical waste, medical equipment, and human remains. Thus, employers with employees in all settings covered by the healthcare section should have already implemented the suite of Universal Precautions required by the BBP standard. Moreover, the BBP standard contains specific requirements for handling laundry, waste, equipment, and human remains (referred to in the BBP standard as "source individuals"). While the controls required by the BBP standard differ from the controls required by the healthcare section, there is overlap, because both standards' requirements pertain to the same activity – that of handling laundry, waste, equipment, and human remains. Thus employers complying with the BBP standard will already be engaged in parallel general practices, even if there are minor variations in the specifics. As such, the healthcare section does not require employers to implement any new controls that present any feasibility challenges for employers already complying with the BBP.

The healthcare section of the ETS also provides that, in settings where biomedical laboratory operations are conducted, the employer must develop and implement policies and procedures to adhere to recognized good biosafety practices. To this end, a fundamental objective of all biosafety programs is containing potentially harmful biological agents, and documents in Table 5 (e.g., Item 18) provide guidance on recognized elements of containment. These elements include strict adherence to Standard Microbiological Practices as well as Special Practices, which may also be needed for handling an infectious agent(s) in accordance with the specified biosafety level (BSL) for that specific infectious agent(s). The BBP standard also

DRAFT

contains requirements for Standard Microbiological Practices and Special Practices in HIV and HBV Research Laboratories and Production Facilities, and also applies to clinical laboratories where there is occupational exposure to blood or other potentially infectious materials. As discussed in more detail in the scope discussion in the Summary and Explanation, biomedical laboratory operations are operations conducted within biomedical diagnostic, research, and production laboratory facilities (including animal research facilities) where COVID-19, contaminated materials, or animals exposed to COVID-19 are handled. As such, the BBP standard contains requirements for recognized good biosafety practices that are applicable in settings covered by the healthcare section (i.e., biomedical laboratories). Any differences in the controls for biomedical laboratories required by the healthcare section do not present any technological feasibility barriers because there will be overlap with respect to the activity of implementing Standard Microbiological Practices and Special Practices.

Finally, in addition to the above requirements, the BBP standard contains requirements for an exposure control plan, engineering and work practice controls, hand hygiene, personal protective equipment, housekeeping (e.g., cleaning and decontamination), and vaccination, which all have corollaries in the healthcare section. While there are differences between the BBP standard and the healthcare section, there is overlap. For example, although the requirements for a COVID-19 plan in the healthcare section are different than those for the exposure control plan required by the BBP standard, the process for developing and implementing these plans should be similar. Based on this overlap, there should not be any technological feasibility barriers to complying with the corollary provisions in the healthcare section.

*Other Provisions*

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There are no technological feasibility barriers related to compliance with other requirements in the ETS (e.g., face coverings, facemasks, and respirators, cleaning and disinfection, health screening and medical management, employee notification). Indeed, as explained above, many of the plans, best practice documents, and scenarios reviewed by OSHA indicate that these controls have been implemented by employers across industry sectors as part of a multilayered approach to protecting workers from the COVID-19 hazard. OSHA highlights a few of the ETS's other requirements below, but only to point out administrative issues that will be explored in more depth in other sections of the preamble.

- Face Coverings (General Section) and Facemasks (Heathcare Section). The general section, § 1910.501, requires employers to provide, and ensure that employees wear, face coverings that are made of at least two layers of fabric that is either a tightly woven material or non-woven material, and have no visible holes or openings in the material. The healthcare section, § 1910.502, requires employers to provide, and ensure that employees wear, facemasks that are cleared or authorized by an FDA EUA. Face coverings and facemasks that meet these requirements are currently widely available.

- Face Coverings (General Section) and Facemasks (Healthcare Section). The general section of the ETS requires that face coverings be replaced (and the healthcare section requires that facemasks be replaced) when soiled or damaged. The Food and Beverage Issue Alliance (FIBA) stated, in an industry best practice document, that face coverings should be replaced when they become soiled or damaged (e.g., because they no longer cover the nose and mouth, have stretched out or damaged ties or straps, cannot otherwise stay on the face, or have holes or tears in the fabric) (FBIA, April 6, 2020). The relevant section of the Summary and Explanation provides further discussion on this topic.

DRAFT

OSHA discusses the costs of complying with these provisions in its economic feasibility analysis.

- Face Coverings (General Section) and Facemasks (Healthcare Section). There may be situations where wearing a face covering or facemask presents a hazard to an employee of serious injury or death (e.g., arc flash, heat stress, interfering with the safe operation of equipment). The general section of the ETS provides an exemption to the face covering requirement (and the facemask requirement in the case of the healthcare section) to address this possibility. The relevant section of the Summary and Explanation provides further discussion on this topic.

- Respirators (Healthcare Section). As noted in the Need for Specific Provisions and Summary and Explanation sections of the Preamble, the increased need for respirators by healthcare workers during the pandemic has resulted in shortages of N95 filtering facepiece respirators (FFRs). The ETS addresses these shortages by encouraging employers to use not only N95 FFRs, but also other respirators such as elastomeric respirators and powered air-purifying respirators (PAPRs), where feasible. For further details, see paragraph (f) of the healthcare section, as well as relevant sections of the Need for Specific Provisions and Summary and Explanation sections of the Preamble.

- Notification (General Section, Healthcare Section). Paragraph (i)(2) of the general section of the ETS and paragraph (l)(2) of the healthcare section of the ETS contain COVID-19 connected notification requirements for both the employer and the employee. OSHA identifies no technological feasibility issues in connection with the ETS's notification requirements. It is the employer's responsibility to ensure that appropriate instructions and procedures are in place so that designated representatives of the

DRAFT

employer (e.g., managers, supervisors) and employees conform to the rule's requirements.

There are also no technological barriers to compliance with the mini respiratory protection program section of the ETS. That section requires employers, many of whom have never developed or implemented a respiratory protection program under the Respiratory Protection standard, 29 CFR 1910.134, to develop and implement one if their employees wear respirators. However, the mini respiratory protection program section will require a program that is far less extensive, and thus easier to comply with, than what is required under 29 CFR 1910.134. For example, the mini respiratory protection program section will not require quantitative fit testing or medical evaluations regarding employees' ability to use respirators, both of which are required under 29 CFR 1910.134. Therefore, OSHA concludes that compliance with the mini respiratory protection program section does not raise issues of technological feasibility. OSHA discusses the administrative cost of complying with the mini respiratory protection program section in its economic feasibility analysis.

*Conclusions for § 1910.501 -- General Section*

OSHA's assessment analyzed the technological feasibility of complying with the requirements in the general section of the ETS for developing a COVID-19 Plan: maintaining physical distancing; installing physical barriers; and ensuring existing ventilation systems are operating as designed. As noted, the general section, § 1910.501, requires employers to develop and implement a COVID-19 plan through a multilayered approach to addressing the spread of COVID-19 by taking feasible measures to reduce or eliminate the transmission of COVID-19. This includes requirements for employers to implement procedures to ensure employees maintain at least 6 feet of physical distancing from others to the extent feasible and, when

DRAFT

distancing is not feasible, to install physical barriers, again to the extent feasible. It also allows flexibility in the material of barriers.

OSHA recognizes that sometimes it may not be feasible to implement either physical distancing or physical barriers for particular work activities, but even if this is the case, employers must still protect their employees through the other provisions of the flexible multilayered approach required by the ETS. The regulatory text allows for alternatives in some situations, and OSHA has identified a variety of alternatives that it believes would be technologically feasible in those situations most of the time. As explained, there are no technological feasibility barriers related to compliance with requirements in the ETS for face coverings, facemasks and respirators, cleaning and disinfection, health screening and medical management, or employee notification. Based on the combination of OSHA's evaluation of technological feasibility of controls in the various scenarios examined, and by analogy to similar scenarios in other industries, OSHA finds that the ETS is technologically feasible for all affected industries in the general section.

*Conclusions for the Healthcare Section*

OSHA has reviewed the requirements imposed by the healthcare section of the ETS and has determined that achieving compliance with the rule is technologically feasible for typical operations in the settings that are covered by that section. In reaching this determination, OSHA reviewed evidence that shows that good infection control or recognized good biosafety practices are routinely implemented by employers who have employees in covered settings. This evidence includes: readily available CDC infection control or biosafety guidance documents, many of which are COVID-19 specific; regulations issued by the Center for Medicare and Medicaid Services (CMS), compliance with which is typically required for accreditation of these settings

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by The Joint Commission; and the application of similar requirements in OSHA's Bloodborne Pathogens Standard, 29 CFR 1910.1030.

Moreover, not all practices, procedures, and controls identified in this technological feasibility assessment will be necessary in all establishments. The ETS provides flexibility for employers to tailor their procedures, practices, and controls to the needs of their facility. For example, employers of workers in off-site laundries, medical waste facilities, and medical equipment reprocessing facilities do not need to implement controls to protect their workers against transmission of COVID-19 from patients.

*Final Conclusion*

As demonstrated above, OSHA finds that employers in typical firms in all industry sectors can comply with the general section and healthcare section of the ETS, and that compliance with the ETS is therefore technologically feasible.

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**B. Economic Feasibility** [Forthcoming]

## VII. Additional Requirements

### Regulatory Flexibility Act

Whenever an agency is required by the Administrative Procedure Act, 5 U.S.C. 553, or another law, to publish a general notice of proposed rulemaking, the Regulatory Flexibility Act (RFA), 5 U.S.C. 601 et seq., requires the agency to prepare an initial regulatory flexibility analysis (IRFA). 5 U.S.C. 601(2), 603(a). Since this ETS "shall serve as a proposed rule" for a final standard under section 6(c)(3) of the OSH Act, it is treated as a general notice of proposed rulemaking under the RFA. An agency may waive or defer the IRFA in the event a rule is promulgated in response to an emergency that makes compliance with the requirements of section 603 impracticable. 5 U.S.C. 608(a). The agency hereby certifies that compliance with the IRFA requirement is impracticable under the circumstances. OSHA prepared this ETS on an expedited basis in response to a national emergency affecting the lives and health of the nation's workers; the IRFA is inherently a relatively lengthy process that would be impracticable to undertake for a standard of such broad applicability in the limited time available. Because OSHA is not preparing an IRFA for the ETS, the agency is also not required to convene a small entity panel under section 609(b).

DRAFT

### Unfunded Mandates Reform Act (UMRA), 2 U.S.C. 1501 *et seq*.

Section 202 of the Unfunded Mandates Reform Act of 1995 (UMRA), 2 U.S.C. § 1532, requires agencies to assess the anticipated costs and benefits of a rule before issuing "any general notice of proposed rulemaking" that includes a Federal mandate that may result in expenditures in any one year by state, local, or Tribal governments, or by the private sector, of at least $100 million, adjusted annually for inflation. The assessment requirement also applies to "any final

rule for which a general notice of proposed rulemaking was published." The agency has satisfied the assessment requirement in section 202 through its analysis of the ETS's benefits and economic feasibility.

**Executive Order 13175**

Section 5 of E.O. 13175, on Consultation and Coordination with Indian Tribal Governments, requires agencies to consult with tribal officials early in the process of developing regulations that: 1) have tribal implications, that impose substantial direct compliance costs on Indian governments, and that are not required by statute; or 2) have tribal implications and preempt tribal law. 65 Fed. Reg. 67249, 67250 (Nov. 6, 2000). E.O. 13175 requires that such consultation occur to the extent practicable. OSHA held a listening session to hear the concerns of tribal representatives during the preparation of this ETS.

**National Environmental Policy Act**

OSHA has reviewed this ETS according to the National Environmental Policy Act (NEPA) of 1969, 42 U.S.C. 4321 *et seq.*, the regulations of the Council on Environmental Quality, 40 CFR part 1500, and the Department of Labor's NEPA procedures, 29 CFR part 11. The Agency has determined that the rule will have no significant impact on air, water, or soil quality; plant or animal life; the use of land; or other aspects of the external environment. To the extent that there is any impact, the ETS may result in an increase in the volume of waste entering the general waste stream due to the increase in use of disposable items such as personal protective equipment, face coverings, and flexible plastic barriers. However, any such waste increase will be marginal and is not expected to impact current waste management practices or channels. Therefore, OSHA concludes that the ETS should have no significant adverse environmental impacts.

DRAFT

**Congressional Review Act**

This ETS is considered a major rule under the Congressional Review Act (CRA), 5 U.S.C. 801 *et seq*. Section 801(a)(3) of the CRA normally requires a 60-day delay in the effective date of a major rule. 5 U.S.C. 801(a)(3), 804(2). However, section 808(2) of the CRA allows the issuing agency to make a rule effective sooner than otherwise provided by the CRA if the agency makes a good cause finding that notice and public procedure are impracticable, unnecessary, or contrary to the public interest. 5 U.S.C. 808(2). OSHA finds that there is good cause to make this rule effective upon publication because notice and public procedure with respect to this ETS are both impracticable and contrary to the public interest, given the expedited timeline on which this standard was developed and the grave danger threatening workers' lives and health (see *Grave Danger* and *Need for the ETS*, both in Section IV of this preamble). Congress authorized OSHA to take swift action in promulgating an ETS to address this type of grave danger, and provided explicitly that an ETS is effective upon publication, 29 USC 655(c)(1); delaying the effective date of such an expedited process would thwart that purpose. It is specifically because of the emergency nature of this rulemaking that the OSH Act allows for OSHA to proceed without the extensive public input the agency normally solicits in issuing occupational safety and health standards. 29 U.S.C. 655(c)(1). For rules to which section 808(2) applies, the agency may set the effective date. In this case, consistent with the OSH Act requirement cited above, the ETS takes immediate effect upon publication in the Federal Register.

**Administrative Procedure Act**

The Administrative Procedure Act (APA) normally requires notice and comment, and a 30-day delay of the effective date of a final rule, for recordkeeping and reporting regulations

DRAFT

promulgated under section 8(c) of the OSH Act. 29 U.S.C. 657(c); 5 U.S.C. 553(b), (d). This ETS contains recordkeeping and reporting requirements tailored to address COVID-19 illness. To the extent that these requirements are not already exempt from the APA's requirements for notice and comment and delay in effective date under section 6(c) of the Act, OSHA invokes the "good cause" exemption to the APA's notice requirement because the Agency finds that notice and public procedure are impracticable and contrary to the public interest under 5 U.S.C. 553(b)(3)(B). As explained in more detail in *Grave Danger* and *Need for the ETS* (both in Section IV of the preamble), this finding is based on the critical importance of implementing the requirements in this ETS, including the recordkeeping and report provisions, as soon as possible to address the grave danger that COVID-19 presents to workers. For the same reason, OSHA finds good cause to waive the normal 30-day delay in the effective date of a final rule from the date of its publication in the Federal Register. *See* 5 U.S.C. 553(d)(3). As noted above, the ETS is required by the OSH Act to take immediate effect upon publication. 29 U.S.C. 655(c)(1).

**Consensus Standards**

OSHA must consider adopting existing national consensus standard that differ substantially from OSHA's standard if the consensus standard would better effectuate the purposes of the Act. *See* section 12(d)(1) of the National Technology Transfer and Advancement Act of 1995 (15 U.S.C.A. 272 Note); *see also* 29 U.S.C. 655(b)(8). OSHA is not aware of any applicable national consensus standards addressing the grave danger posed by COVID-19 specifically. OSHA is, however, incorporating by reference several consensus standards for face shields and CDC guidance. *See* section 1910.509, on incorporation by reference. OSHA considered incorporation of ASTM F3502-21 in this ETS, as required. However, the agency has determined that it is infeasible for the time frame of this ETS to incorporate this consensus

DRAFT

standard or to otherwise establish additional criteria for face coverings beyond that already recommended by the CDC due to the time needed to manufacture and distribute such a new product (see the discussion of face coverings in the *Need for Specific Provisions*, which is located in Section V of the preamble).

**Executive Order 13045**

Executive Order 13045, on Protection of Children from Environmental Health Risks and Safety Risks, requires that Federal agencies submitting covered regulatory actions to OIRA for review pursuant to Executive Order 12866 must provide OIRA with (1) an evaluation of the environmental health or safety effects that the planned regulation may have on children, and (2) an explanation of why the planned regulation is preferable to other potentially effective and reasonably feasible alternatives considered by the agency (62 FR 19885 (4/23/1997)). Executive Order 13045 defines "covered regulatory actions" as rules that may (1) be economically significant under Executive Order 12866, and (2) concern an environmental health risk or safety risk that an agency has reason to believe may disproportionately affect children. Because OSHA has no reason to believe that the risk from COVID-19 disproportionately affects children, the ETS is not a covered regulatory action and OSHA is not required to provide OIRA with further analysis under section 5 of the executive order. However, to the extent children are exposed to COVID-19 either as employees or at home as a result of family members' workplace exposures to COVID-19, the ETS should decrease children's exposures to the virus. Further, to the extent schools and child care facilities are covered by this ETS, the ETS's protections are expected to reduce cases of COVID-19 among teachers and staff at those facilities which should, in turn, reduce transmission to children, and enable children to attend school safely.

**Consultation with Advisory Committees**

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OSHA intends to seek input on this ETS from the Advisory Committee on Construction Safety and Health (ACCSH) and the Maritime Advisory Committee on Occupational Safety and Health (MACOSH) in the coming months. However, the agency determined that it was not required to do so before issuing this standard. OSHA's rulemaking procedures require consultation with ACCSH before promulgating a standard, 29 CFR 1911.10, but that requirement applies only to rulemaking under section 6(b) of the OSH Act, rather than section 6(c). 29 CFR 1911.1. Likewise, although MACOSH is empowered to advise OSHA in formulating maritime industry standards, 29 CFR 1912.13(a); 29 USC 656(d), neither OSHA regulations nor the OSH Act require consultation before issuing an ETS.

**Federalism**

The Agency reviewed this ETS according to Executive Order 13132, on Federalism, which requires that Federal agencies, to the extent possible, refrain from limiting State policy options, consult with States before taking actions that would restrict States' policy options, and take such actions only when clear constitutional authority exists and the problem is of national scope. 64 FR 43255 (8/10/1999). The Executive Order allows Federal agencies to preempt State law only with the express consent of Congress. In such cases, Federal agencies must limit preemption of State law to the extent possible.

The Occupational Safety and Health Act is an exercise of Congress's Commerce Clause authority, and under Section 18 of the Act, 29 U.S.C. 667, Congress expressly provided that States may adopt, with Federal approval, a plan for the development and enforcement of occupational safety and health standards. OSHA refers to States that obtain Federal approval for such plans as "State Plans." Occupational safety and health standards developed by State Plans must be at least as effective in providing safe and healthful employment and places of

DRAFT

employment as the Federal standards. Subject to these requirements, State Plans are free to develop and enforce their own occupational safety and health standards.

This ETS complies with E.O. 13132. The problems addressed by this ETS for COVID-19 are national in scope. As explained in *Grave Danger* (Section IV of the preamble), employees face a grave danger from exposure to COVID-19 in their workplaces. Employees across the country, in all industry sectors, face the danger of exposure at work, and as explained in *Need for the ETS* (Section IV of the preamble), a national standard is needed to ensure that a uniform, baseline approach is taken to protect them all. The SARS-CoV-2 virus is highly communicable and infects workers without regard to state borders, making a national approach necessary. Accordingly, the ETS establishes minimum requirements for employers in every State to protect their employees from the risks of exposure to COVID-19. In States without OSHA-approved State Plans, Congress expressly provides for OSHA standards to preempt State occupational safety and health standards in areas addressed by the Federal standards. In these States, the ETS limits State policy options in the same manner as every standard promulgated by the Agency. Furthermore, nothing in the ETS is intended to limit general public health measures instituted by state or local governments that go beyond, and are not inconsistent with, the requirements of the ETS. In States with OSHA-approved State Plans, this ETS does not significantly limit State policy options. Any special workplace problems or conditions in a State with an OSHA-approved State Plan may be dealt with by that State's standard, provided the standard is at least as effective as this ETS. Several state plan states have adopted COVID-19 workplace requirements, and OSHA has consulted with them in developing this emergency temporary standard.

**State Plans**

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When Federal OSHA promulgates an emergency temporary standard, States and U.S. Territories with their own OSHA-approved occupational safety and health plans ("State Plans") must either amend their standards to be identical or "at least as effective as" the new standard, or show that an existing State standard covering this area is "at least as effective" as the new Federal standard. 29 CFR 1953.5(b). Adoption of the ETS by State Plans must be completed within 30 days of the promulgation date of the final Federal rule, and State Plans must notify Federal OSHA of the action they will take within 15 days. The State standard must remain in effect for the duration of the Federal emergency temporary standard.

Of the 28 States and Territories with OSHA-approved State Plans, 22 cover both public and private-sector employees: Alaska, Arizona, California, Hawaii, Indiana, Iowa, Kentucky, Maryland, Michigan, Minnesota, Nevada, New Mexico, North Carolina, Oregon, Puerto Rico, South Carolina, Tennessee, Utah, Vermont, Virginia, Washington, and Wyoming. The remaining six States and Territories cover only state and local government employees: Connecticut, Illinois, Maine, New Jersey, New York, and the Virgin Islands.

This emergency temporary standard imposes new requirements to protect workers across the nation from COVID-19, and includes additional provisions applicable to employers in healthcare and healthcare-related fields. It is applicable to all industry sectors covered by OSHA, including general industry, construction, agriculture, shipyard employment, marine terminals, and longshoring.

**VIII. Summary and Explanation**

*Scope and application*

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This ETS applies, with limited exception, to all employers and places of employment covered under the OSH Act.[23] Under the ETS, each employer is required to take action (for example, by developing and implementing a COVID-19 plan) to protect employees against the grave danger posed by COVID-19. The majority of employers subject to the ETS are covered by the general section of the ETS. A separate section applies to employers in specific settings: healthcare facilities (e.g., hospitals, long-term care, emergency response), healthcare support facilities (e.g., laundries, medical waste facilities), death care facilities (e.g., mortuaries), and biomedical laboratories. These settings are collectively referred to as "healthcare" in this *Summary and Explanation*. Certain employers, in some cases, are subject to both the general section and the healthcare section depending on the activities of their employees and the setting in which they are conducted. This section of the *Summary and Explanation* will address the scope and application of the general and healthcare sections of the ETS. OSHA addresses the scope and application of the "mini respiratory protection program" section of the ETS, later in the *Summary and Explanation* when it discusses that section.

**The General Section**

The grave danger of COVID-19 exposure cuts across all industry sectors wherever an employee is exposed to other people. Whether employees are engaged in meatpacking, manufacturing, retail work, restaurant work, construction, agriculture, or any other type of work that requires proximity or close contact with others, they can be in danger of being infected with

[23] In addition to the scope exceptions contained in the ETS itself, which are discussed in this section, there may be situations where the ETS does not apply by operation of the OSH Act. For example, the OSH Act does not apply to working conditions of employees with respect to which other Federal agencies have exercised their statutory authority to prescribe or enforce standards or regulations affecting occupational safety or health (see 29 USC 653(b)(1)). Moreover, while the ETS does not apply where states with OSHA-approved occupational safety and health programs ("State Plans") have coverage (see 29 USC 667), State Plans must adopt and enforce COVID-19 requirements that are at least as effective as the ETS. Finally, the ETS does not apply to state and local government employers in states without State Plans (see 29 USC 652(5)).

DRAFT

a virus that can be deadly. To this end, paragraph (a) of the general section of the ETS applies to all employers and places of employment, with certain limited exception as described in paragraphs (a)(1) through (3) of that section.

OSHA recognizes that exposure to other people, be they employees, customers, clients, or delivery people or other visitors to a workplace, is the primary source of risk associated with exposure to COVID-19, and that an employee who is not exposed to other people at a worksite has little to no risk while the employee is at that worksite. Thus, paragraph (a)(1) excludes from the general section of the ETS places of employment where there is only one employee at the workplace and no other people are in the workplace. Given the dangers of COVID-19, the exclusion in paragraph (a)(1) is a particularly narrow one. To determine whether this exclusion applies, employers will need to determine whether an employee working alone at a workplace *might* be exposed to other people during the course of their duties in the workplace. If the employer determines that such exposure is reasonably possible, it will need to comply with the general ETS to protect the employee from COVID-19 while the employee is at the workplace. If the employee is not in fact exposed to anyone while at the workplace, this will not render the general section inapplicable if there is a reasonable possibility of exposure to other people in the workplace.

As an example, an employer might very well determine that the standard does not apply in the case of a lone employee cutting brush behind a private residence where there is no risk of exposure to other people. However, the standard would apply in the case of an employer of a lone employee maintaining a flowerbed next to a sidewalk with pedestrians, when the employee could reasonably be expected to be within 6 feet of the pedestrians.

DRAFT

Paragraph (a)(2) excludes from the general section employees while working from home. OSHA recognizes that it is not impossible that an employee might be exposed to other people while working from home (family, delivery people, service people, etc.), but OSHA recognizes employers would face difficulty in monitoring or controlling exposures in a private home and the agency is reluctant to impose emergency requirements extending into the home without the opportunity for notice and comment. This is particularly true when the standard is not intended to protect employees from non-work-related hazards they would typically encounter at home.

OSHA notes that this exclusion applies only "while" an employee is working from home. The exclusion does not entirely relieve the employer from compliance with the general section as to that employee. Employers must account for them in their COVID-19 plan, either restricting those employees from returning to the workplace or developing clear conditions for when and how the employee is allowed in a shared workplace. To the extent that a teleworking employee does enter a shared workspace, even temporarily, the exemption does not apply and the employer must ensure compliance with all applicable portions of the standard (e.g. training, COVID-19 plan, provide face coverings). For example, an employer of a repair person would be subject to the general section of this ETS even if the repair person travels straight from their residence to the residence of another person to perform a repair. An employer with an employee who teleworks half of each week would need to account for that employee in the employer's COVID-19 plan and would need to ensure that the employee complies with the medical screening and notification provisions of the ETS, along with all of the other relevant provisions such as providing that employee a face covering, while the employee is at the workplace.

Paragraph (a)(3) excludes from the general section of the ETS the settings covered by the healthcare section of the ETS (e.g., healthcare, long term care, emergency response, mortuary

DRAFT

services, biomedical laboratory operations). OSHA notes, however, that certain tasks are specifically excluded from the healthcare section and would be covered by the general section of the ETS. OSHA will address the settings covered and tasks excluded by the healthcare section later in the summary and explanation when it addresses the scope and application of the healthcare section.

Paragraph (a) of the general section and paragraph (a) of the healthcare section contain identical notes. The notes make clear that state or local government mandates or guidance (e.g., legislative action, executive order, health department order) that go beyond and are not inconsistent with the general section or the healthcare section are not intended to be limited by those sections. OSHA recognizes that many states have taken action to protect employees with mandatory requirements that may not be appropriate for an ETS on a national level, and that states have additional powers that OSHA does not (e.g., criminal sanctions). OSHA does not intend to preempt these powers or requirements. For example, OSHA does not intend to preempt state or local COVID-19 testing requirements or state or local requirements for customers to wear face coverings whenever they enter a place of business. The notes in paragraph (a) of the general section and paragraph (a) of the healthcare section clarify that nothing in those sections is intended to limit state or local government mandates or guidance that require or recommend COVID-19 testing of employees, or any other more expansive state or local government mandate or guidance that are not inconsistent with the requirements of the ETS.

**The Healthcare Section**

While the general section of the ETS applies to most employers covered under the ETS, the healthcare section applies only to employers in healthcare and related industry sectors. OSHA concludes that a separate section of the standard is necessary for employers in healthcare

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and related industries because employees in these industries are expected to be regularly exposed to COVID-19 in the course of performing their job functions. For example, these employees treat, or work in proximity to, patients with suspected or confirmed COVID-19; handle medical waste, medical equipment and laundry from facilities where patients with suspected or confirmed COVID-19 are treated; handle human remains that may contain COVID-19; and handle biological specimens containing COVID-19 while engaged in biomedical laboratory operations.

Paragraph (a)(1) of the healthcare section applies to all settings where any employee: (i) provides healthcare services; (ii) performs healthcare support services; (iii) handles contaminated materials; (iv) handles human remains; or (v) conducts biomedical laboratory operations. It is important to note that, for the most part, the healthcare section is settings-based; that is, if any employee in any setting performs one of the tasks enumerated in paragraphs (a)(1)(i) through (v), above, that employee's employer must (with limited exceptions, discussed later in the *Summary and Explanation*) follow the healthcare section to protect all the employees in that setting, even though some of these employees might not engage in the enumerated tasks. Thus, for example, the healthcare section would generally apply to protect all employees in a hospital (e.g., employees working in the cafeteria, employees performing administrative tasks in an office within the hospital), not just those employees providing healthcare services, performing healthcare support services, handling contaminated materials or human remains, or conducting biomedical operations. OSHA takes a settings-based approach in the healthcare section, rather than a task-based approach, to ensure that the healthcare section is consistent with the CDC's COVID-19 guidance, which also takes a settings-based approach.

The term "setting" can encompass several types of scenarios. On the one hand, if a service is performed in a facility whose primary function is the provision of healthcare services

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(such as a hospital, urgent care facility, or outpatient clinic), all areas in the facility would be considered part of the same setting. For example, a pharmacy or optical department in a hospital would be considered part of the hospital setting. On the other hand, an embedded clinic in a prison, manufacturing facility, or school would be treated as a healthcare setting that is separate from the remainder of the prison, manufacturing facility, or school (i.e., the non-healthcare setting).

On the other hand, in the case of mobile healthcare services, where licensed healthcare providers enter a non-healthcare setting to provide services (e.g., emergency response or home healthcare), this section applies only to the provision of the healthcare services (i.e., the measures necessary to assure safe work practices for the work tasks that the employees providing the healthcare services are expected to perform) and not to the setting itself. For example, if a nurse provides in-home healthcare while a cleaning person happens to be working separately in the house, the healthcare section applies to the nurse and the general section applies to the cleaning person. OSHA does not intend the healthcare section to apply generally to non-healthcare settings even though emergency response services may be required. For further discussion of this issue, please see discussion of paragraph (a)(3)(ii) of the healthcare section, below.

As discussed below, healthcare support services include laundering of contaminated materials like hospital sheets and towels. With respect to laundering facilities and certain other facilities subject to the healthcare section (e.g., medical waste facilities, medical equipment reprocessing facilities), the trigger for application of the healthcare section is the handling of contaminated materials in a place of employment that would otherwise be covered by the general section. In such cases, where the handling of the materials is the only potential exposure that triggers application of the healthcare section, the healthcare section applies to the area of the

DRAFT

facility in which the handling occurs, but not to the other areas in the facility. For example, when the laundering takes place in a hospital, as stated, all employees in that facility are subject to the healthcare section. On the other hand, if the laundering takes place at an off-site facility, employees handling the laundry and anyone else who is spending time in those areas (janitor, maintenance, etc.) must follow the healthcare section. Other employees who work in different areas of the facility, such as a receptionist who works in a different area, are subject to the general requirements of the general section, but only to the extent they do not enter the laundering area or other areas where contaminated materials are handled.

Similarly, where the conduct of biomedical laboratory operations and related handling of contaminated materials is the only potential exposure that triggers application of the healthcare section, the healthcare section applies to the areas of the facility in which those operations are conducted (e.g., handling biological specimens) or contaminated materials are otherwise handled, but not to the other areas in the facility. Thus, for example, clerks who work in a file room are subject to the requirements of the general section, but only to the extent they do not enter those areas where biomedical laboratory operations are conducted or contaminated materials are otherwise handled.

As a final example, in facilities where the handling of human remains is the only potential exposure that triggers application of the healthcare section (e.g., funeral homes), the healthcare section applies to the area in which the handling occurs, but not to the other areas in the facility. Thus, for example, employees in an office setting in separate areas of the facility where there is no exposure to human remains would be covered under the general section, but if these employees enter areas where there is exposure to human remains (e.g., body preparation areas) they are then covered under the healthcare section.

DRAFT

OSHA also notes that application of one section or another in the facilities discussed above will not have a material impact on compliance to the extent provisions in the healthcare section are not applicable to those facilities or mirror those in the general section. Thus, for example, paragraph (d) of the healthcare section (Patient screening and management), is unique to the healthcare section but applies only in settings where direct patient care is provided, and paragraph (j) (Cleaning and disinfection), contains provisions that apply only in patient care areas, resident rooms, and for medical devices and equipment, but also contains provisions that mirror the general section that apply in all other areas. Thus, in many cases, the same requirements will apply whether the employer is subject to the general section or the healthcare section.

The healthcare section defines healthcare services as services that are provided to individuals by professional healthcare practitioners, who generally have either licensure or credentialing requirements (e.g., doctors, nurses, emergency medical personnel, pharmacists, physical therapists, massage therapists, dentists) for the purpose of promoting, maintaining, monitoring, or restoring health. Healthcare services are delivered through various means including: hospitalization, long-term care, ambulatory care (e.g., treatment in physicians' offices, dentists' offices, and medical clinics), home health and hospice care, emergency medical response, and patient transport. As discussed earlier, while healthcare services are provided in healthcare settings (e.g., hospitals, ambulatory care facilities, such as dentists' offices and doctors' offices, ambulatory surgical centers, medical clinics embedded in schools, correctional facilities, and industrial settings, ambulances, long-term care facilities, such as nursing homes and skilled nursing facilities, urgent care centers), they are also provided in non-healthcare settings.

DRAFT

*Healthcare support services* is defined in the healthcare section to mean services that facilitate the provision of healthcare services. Healthcare support services include patient intake/admission, patient food services, equipment and facility maintenance, housekeeping services, healthcare laundry services, medical waste handling services, and medical equipment cleaning/reprocessing services. Moreover, healthcare support services can occur both in the same setting where healthcare services are provided and in other settings. For further discussion of this issue, please see discussion of paragraph (a)(2)(iv) of the healthcare section, below.

The healthcare section defines *contaminated material* as an item, biological specimen, or a surface that is a source of COVID-19 and is in, or originates from, a setting where: healthcare services are provided; human remains are handled; or biomedical laboratory operations are conducted, and defines *handling of contaminated materials* as activities including the intake, collection, processing, containerization, storage, transport, shipping, disposal, or decontamination of contaminated materials. Settings where contaminated materials are handled include: settings where healthcare services are provided, in addition to other settings, such as laundries that handle linens, gowns, scrubs from healthcare settings, medical waste handling facilities, medical equipment reprocessing facilities (e.g., durable medical equipment supply companies that rent reusable equipment (e.g., hospital beds and wheelchairs)), mortuaries and biomedical laboratories. Because it is impossible to see whether a towel, sheet, or other item is contaminated with the virus that causes COVID-19, employers must presume that materials are contaminated whenever they are used by, or otherwise come into contact with, someone with COVID-19. OSHA notes that many tasks involving the handling of contaminated materials (for example, the laundering of hospital linens, the transporting of medical specimens, the disposing of medical waste, the reprocessing, maintaining, servicing or repairing of medical equipment, the

DRAFT

conducting of autopsies, the performing of mortuary services, and the preparing and analyzing of biological cultures, specimens, or human remains) likely occur both in settings where healthcare services are provided and in other settings.

*Handling of human remains* is defined in the healthcare section as activities including the intake, collection, processing, storage, transport, shipping, cremation, or burial of human remains. Settings where human remains are handled include: settings where healthcare services are provided, medical examiners' offices, morgues, mortuaries, and some biomedical laboratories (e.g., forensic laboratories) and teaching facilities.

Finally, the healthcare section defines *biomedical laboratory operations* as operations conducted within biomedical diagnostic, research, and production laboratory facilities (including animal research facilities) where COVID-19, contaminated materials, or animals exposed to COVID-19 are handled. Biomedical diagnostic laboratory facilities (e.g., clinical laboratories) include settings where tests on biological specimens from patients or human remains are performed to identify the nature or cause of a problem (such as whether a patient has COVID-19 or a person died from COVID-19). Biomedical research laboratory facilities include settings where investigations are conducted to determine the causes of disease like COVID-19 through careful experimentation, observation, laboratory work, analysis, and testing. Scientists conduct research to discover ways to prevent illness, and to develop products, medications, and procedures to treat and cure diseases and conditions that cause illness and death in humans and animals. Biomedical production laboratory facilities include settings that produce biological agents for various purposes including the production of vaccines (e.g., a COVID-19 vaccine).

OSHA notes that the healthcare section generally does not cover veterinarians and veterinary technologists, technicians, or assistants, except when these employees perform tasks

DRAFT

enumerated in paragraph (a) of the healthcare section, or work in settings that are covered under the healthcare section. For example, veterinarians and animal caregivers are covered when they work in a biomedical research facility where COVID-19, contaminated materials, or animals exposed to COVID-19 are handled. It should be noted that the general section of the ETS covers veterinarians and veterinary technologists, technicians, or assistants to the extent they are not covered by the healthcare section.

Paragraph (a)(2) of the healthcare section provides that the section does not apply to the following tasks: (i) the provision of first aid by an employee who is not a licensed healthcare provider; or (ii) the dispensing of prescriptions by pharmacists in retail settings; or (iii) healthcare services or healthcare support services that (A) are performed outside of a setting where direct patient care occurs (e.g., telehealth, off-site medical billing), and (B) do not involve the handling of contaminated materials. Paragraph (a)(2) provides further that the tasks enumerated in paragraphs (a)(2)(i) through (iii) are covered by the general section of the ETS. This provision serves to ensure that there is no hole in coverage for employees exposed to COVID-19 in the course of their duties; either the general section or the healthcare section applies.

Per paragraph (a)(2)(i), the healthcare section does not apply to the provision of first aid by an employee who is not a licensed healthcare provider. First aid is the initial care, including cardiopulmonary resuscitation (which includes chest compressions, rescue breathing, and, as appropriate, other heart and lung resuscitation techniques) of a sick or injured person until medical treatment by a licensed healthcare provider can be administered. This exception applies regardless of setting. Thus, for example, if an employee who is not a licensed healthcare provider is expected to administer first aid as part of their job duties in an industrial facility, the healthcare

DRAFT

section does not apply even if first aid is provided to a person who develops COVID-19 symptoms while on the job. OSHA included this exemption in the healthcare section to make clear that this ETS does not impose extra healthcare-related requirements for employees who are not licensed healthcare providers when they provide first aid. Like the majority of employees covered by the OSH Act, these employees will be covered by the general section, as noted above. First aid provided by licensed healthcare providers (e.g., a nurse or emergency responder) is still covered by this section.

Paragraph (a)(2)(ii) of the healthcare section does not apply to the dispensing of prescriptions by pharmacists in retail settings (e.g., pharmacies embedded in grocery stores). This is a situation where employees provide healthcare services in a setting and in a manner that is consistent with tasks covered by the general section. For example, the interaction that a pharmacist in a retail setting has with customers and coworkers is similar to that of other employees in retail establishments. OSHA emphasizes that the exception for the dispensing of prescriptions by pharmacists in retail settings does not apply when this activity is performed in healthcare settings such as hospitals or ambulatory care clinics (where the pharmacist is covered by the healthcare section as a result of the setting).

Finally, paragraph (a)(2)(iii) provides that the healthcare section does not apply to healthcare services or healthcare support services that (A) are performed outside of a setting where direct patient care occurs (e.g., telehealth, off-site medical billing), and (B) do not involve the handling of contaminated materials. “Direct patient care,” means hands on, face-to-face contact in close proximity with patients for the purpose of diagnosis, treatment, care and monitoring.

DRAFT

Some healthcare services, such as healthcare services delivered remotely (e.g., telehealth) and medical billing, do not always occur in settings where direct patient care occurs. These healthcare services can be delivered from an employee's home or a suite in an office building. In such cases (assuming the healthcare services in question do not involve exposure to contaminated materials), the employee is not exposed to any of the hazards the healthcare section is intended to prevent, so applying that section would not be appropriate; these settings and services would be covered under the general section of the ETS.[24] However, the healthcare section does apply if these services are provided in a setting where direct patient care is provided, such as a doctor's office in a hospital or ambulatory care clinic.

While healthcare support services are often performed in settings where direct patient care does not occur (e.g., laundries that handle linens, gowns, scrubs from healthcare settings; medical waste handling facilities; medical equipment reprocessing facilities (e.g., durable medical equipment supply companies that rent reusable equipment (e.g., hospital beds and wheelchairs))), most of these services involve exposure to contaminated materials. A very small minority of these services might not involve exposure to contaminated materials. For example, medical billing or other administrative activities might be performed in an off-site office building and not involve exposure to people with suspected or confirmed COVID-19 or contaminated materials. In such cases, the healthcare section does not apply.

Paragraph (a)(3)(i) of the healthcare section provides that, where a healthcare setting is embedded within a non-healthcare setting (e.g., nurse's office in a school, medical clinic in a manufacturing facility or prison, walk-in clinic in a retail setting such as a grocery store,

[24] However, as discussed earlier in the summary and explanation, the general section does not apply to employees while working from home. Therefore, neither the healthcare section nor the general section applies while an employee delivers healthcare services remotely from home (although, as also discussed earlier, the general section exemption applies only while an employee is working from home).

DRAFT

physician's office or dentist's office embedded in an office building), the healthcare section applies only to the embedded setting and not to the remainder of the physical location, which is covered under the general section. OSHA notes that each medical, dental, or similar practice embedded in an office building would be a separate healthcare setting from the other medical, dental, or similar practices in the office building, even if all tenants in the office building are medical, dental, or similar practices.

Paragraph (a)(3)(ii) of the healthcare section provides that, where emergency responders or other licensed healthcare providers (e.g., school nurse providing care to a student in a classroom) enter a non-healthcare setting to provide healthcare services, the healthcare section applies only to the provision of the healthcare services by that employee. In this limited situation, the healthcare section applies to healthcare services provided by employee(s) in a setting, and the general section applies to all other employees in that setting. This provision would apply, for example, where a physician assigned to work in an embedded clinic or an emergency medical responder enters the floor of a manufacturing plant or the residential area of a prison to provide healthcare services to a sick employee or sick prisoner, or where a school nurse assigned to work in an embedded clinic or an emergency medical responder enters a classroom to provide healthcare services to a student who has vomited. In such circumstances, the healthcare section applies to the provision of healthcare services by the physician, school nurse, or emergency responder, but the general section applies to all other employees in the setting. For example, the general section, and not the healthcare section, applies to a school custodian who cleans up the vomit of the sick student, or a teacher who remains in the classroom while the school nurse or emergency responder provides healthcare services to the student, or plant workers or prison

DRAFT

guards who remain on the manufacturing plant floor or in the prison residential area while the physician provides healthcare services to the sick employee or prisoner.

*COVID-19 plan*

Paragraph (c) of both the general and healthcare sections includes provisions for the development and implementation of a COVID-19 plan, as well as requirements regarding what needs to be in the plan. The development of a COVID-19 plan, including comprehensive policies and procedures, is required in order to prevent or minimize employee exposure to COVID-19 in the workplace. All of the requirements in paragraph (c) must be included in the employer's COVID-19 plan.

Paragraph (c)(1) requires employers to develop and implement a COVID-19 plan for each workplace. As defined in paragraph (b) of both sections, a *workplace* is a physical location (e.g., fixed, mobile) where the employer's work or operations are performed. *Physical location* is also defined in paragraph (b). It means a site (including outdoor and indoor areas, a structure, or a group of structures) or an area within a site where work or any work-related activity occurs (e.g., taking breaks, going to the restroom, eating, entering or exiting work). A physical location includes the entirety of any space associated with the site (e.g., workstations, hallways, stairwells, breakrooms, bathrooms, elevators) and any other space that an employee might occupy in arriving, working, or leaving. As explained in paragraph (c)(1), if an employer has multiple facilities that are substantially similar, its COVID-19 plan may be developed by facility type rather than by individual workplace so long as any site-specific information is included in the plan. For example, if an employer has developed a corporate COVID-19 plan that includes information about job tasks or exposure scenarios that apply in multiple workplaces, this information can be used in the development of COVID-19 plans for individual workplaces.

DRAFT

In general, paragraphs (c)(2) through (c)(6) describe the process by which the COVID-19 plan must be developed and implemented, and paragraph (c)(7) lists policies and procedures that must be included in the COVID-19 plan. However, the COVID-19 plan is adaptable to the physical characteristics of the workplace and the job tasks performed by employees, as well as the hazards identified by the employer when designing their COVID-19 plan. As explained in a note to paragraph (c), employers may also include other policies, procedures, or information necessary to comply with any applicable federal, state, or local public health laws, standards, and guidelines in their COVID-19 plans.

Under paragraph (c)(2), an employer with more than 10 employees is required to develop and implement a written COVID-19 plan. While OSHA has concluded that a COVID-19 plan is necessary for all employers covered by the ETS, OSHA has determined that only employers with more than 10 employees need to have a written plan. This cutoff of 10 employees is consistent with OSHA's employer size cutoff for both the COVID-19 log requirement in this ETS and in the partial exemption from recordkeeping requirements in 29 CFR 1904.1. In the case of employers with 10 or fewer employees, the agency does not believe that there is a high likelihood of misunderstanding when employers communicate their COVID-19 plans to employees verbally. As a result, OSHA does not believe the added burden on small employers of establishing a written plan is necessary, particularly given the need for rapid implementation of the ETS. However, small employers may opt to create written COVID-19 plans if they find doing so is helpful in developing and implementing their COVID-19 plans.

In contrast, the agency is concerned that when employers have more than 10 employees there is likely sufficient complexity in the employer's operation that putting the COVID-19 plan in writing is necessary to establish clear expectations and prevent miscommunication. For

DRAFT

example, employers with more than 10 employees may have employees working in multiple locations or on multiple shifts, increasing the likelihood that verbally communicating the employer's COVID-19 plan will be ineffective. Therefore, OSHA believes that having a written COVID-19 plan that employees of larger employers can easily access is essential to ensure those employees are informed about policies, programs, and protections implemented by their employers to protect them from COVID-19-associated hazards. This approach is consistent with OSHA's practice of allowing employers with 10 or fewer employees to communicate their emergency action plans (29 CFR 1910.38) and fire prevention plans (29 CFR 1910.39) orally to employees.

An employer may have already developed and implemented a COVID-19 plan to protect employees from exposure to COVID-19. Existing COVID-19 plans may fulfill some of the requirements in these sections. It is not OSHA's intent for employers to duplicate current effective COVID-19 plans, but each employer with a current COVID-19 plan must evaluate that plan for completeness to ensure it satisfies all of the requirements of these sections. Employers with existing plans must modify and/or update their current COVID-19 plans to incorporate any missing required elements, and to provide training on these new updates or modifications to all employees. Employers with more than 10 employees must ensure their existing COVID-19 plan is in writing.

For those employers who do not already have a COVID-19 plan in place, the Centers for Disease Control and Prevention (CDC) has developed *Guidance for Businesses and Employers Responding to Coronavirus Disease 2019* (CDC, January 4, 2021), that may be helpful to employers in developing a plan. OSHA has also published key resources for all businesses, including *Protecting Workers: Guidance on Mitigating and Preventing the Spread of COVID-19*

DRAFT

*in the Workplace* (OSHA, January, 29, 2021), *Guidance on Returning to Work* (OSHA, June 18, 2020) and *Guidance on Preparing Workplaces for COVID-19* (OSHA, March 9, 2020).[25] (OSHA and the U.S. Department of Health and Human Services developed the latter jointly.) The *Guidance on Preparing Workplaces for COVID-19* document is based on traditional infection prevention and industrial hygiene practices, and is meant to help employers and employees identify risk levels in workplace settings and determine appropriate control measures to implement. The *Guidance on Returning to Work* document complements *Guidance on Preparing Workplaces for COVID-19* and focuses on the need for employers to develop and implement strategies for hand hygiene, cleaning and disinfection of high-touch surfaces, physical distancing, identification and isolation of sick employees, workplace controls and flexibilities, and employee training. The *Protecting Workers: Guidance on Mitigating and Preventing the Spread of COVID-19 in the Workplace* document is intended to help employers and workers implement a coronavirus prevention program, with several essential elements, and better identify risks which could lead to exposure and contraction.

Additionally, the U.S. Equal Employment Opportunity Commission (EEOC) has developed guidance regarding *What You Should Know About COVID-19 and the ADA, the Rehabilitation Act, and Other EEO Laws* (EEOC, 2020). Employers are encouraged to review this guidance as they develop their COVID-19 plan, including policies and procedures for health screenings, as well as return to work plans. Additional information about labor, disability, and

DRAFT

[25] OSHA's *Guidance on Returning to Work* (OSHA, June 18, 2020) and *Guidance on Preparing Workplaces for COVID-19* (OSHA, March 9, 2020) has now been archived following the publication of OSHA's *Protecting Workers: Guidance on Mitigating and Preventing the Spread of COVID-19 in the Workplace* (OSHA, January 29, 2021). However, the information in these documents can still be a useful resource for employers as they develop or re-evaluate their COVID-19 plans.

employment laws is available on the Summary of the Major Laws of the Department of Labor webpage (DOL, 2020).

Paragraph (c)(3) requires the employer to designate one or more workplace COVID-19 safety coordinators to implement and monitor the COVID-19 plan. In order to perform these tasks effectively, the safety coordinator(s) should be able to understand and identify COVID-19 hazards in the workplace. The safety coordinator(s) must have the authority to ensure compliance with all aspects of the COVID-19 plan so that they can take prompt corrective measures when hazards are identified. For employers with more than 10 employees, the name of the safety coordinator(s) must be documented in the written COVID-19 plan.

Employers must designate a safety coordinator(s) to implement and monitor the COVID-19 plan, but the exact responsibilities of a safety coordinator(s) may vary based on the employer and workplace. Possible safety coordinator responsibilities may include conducting inspections of the workplace. Regular inspections would provide a mechanism for safety coordinator(s) to ensure the COVID-19 plan is being implemented appropriately and to monitor the ongoing effectiveness of the plan. In a manufacturing setting, ventilation may be of concern, so the safety coordinator(s) could walk through the area and check on the timing of the cycling of air returns. At the same time, the safety coordinator(s) could observe employees to ensure they are physically distancing and using face coverings. In grocery stores, where employees may have many encounters with members of the public, the safety coordinator(s) could conduct inspections to ensure that there are appropriately sized physical barriers installed between employees and customers, and that all employees are wearing a face covering. If an employer relies on its safety coordinator to monitor compliance with the requirements of its COVID-19 plan and this ETS, it must provide the safety coordinator with adequate training on how to discharge those duties.

DRAFT

Paragraph (c)(3) of the healthcare section contains the additional requirement that the COVID-19 safety coordinator(s) must be knowledgeable in infection control principles and practices as they apply to the workplace and employee job operations. For example, safety coordinator(s) in healthcare settings must be knowledgeable about the CDC's infection control recommendations, as well as employer policies and procedures implemented in accordance with the same (e.g., the patient screening and management strategies implemented pursuant to paragraph (d)(3) of the healthcare section).

Paragraph (c)(4) of both the general and healthcare sections requires the employer conduct a workplace-specific hazard assessment to identify potential workplace hazards related to COVID-19. The hazard assessment process is intended to help employers identify and understand where COVID-19 hazards potentially exist and what controls must be implemented in their workplace in order to minimize the risk of transmission of COVID-19. As part of the hazard assessment, employers must inspect the entire workplace to find existing and potential risks of employee exposure to COVID-19 (e.g., potentially contaminated materials/objects/surfaces). The hazard assessment must include an evaluation of employees' potential workplace exposure to all people present at the workplace, including coworkers, employees of other entities, members of the public, customers or clients, independent contractors, visitors, and other non-employees. Places and times where people may congregate or come in contact with one another must be identified and addressed, regardless of whether employees are performing an assigned work task or not. For instance, people may congregate during meetings or training sessions, as well as in and around entrances, bathrooms, hallways, aisles, walkways, elevators, breakrooms or eating areas, and waiting areas. All of these areas must be identified and addressed as part of the hazard assessment. Employers must consider how

DRAFT

employees and other persons enter, leave, and travel through the workplace, in addition to addressing potential COVID-19 hazards employees are exposed to at fixed work locations.

Employers have flexibility to determine the best approach to accomplish the overall hazard assessment. For example, the hazard assessment could be adapted and tailored to specialized clinical services, the physical characteristics of the workplace, the number of people in the workplace, or the prevalence of COVID-19 in the surrounding community. Employers may also want to consult state or local public health laws, standards, and guidelines in determining how best to conduct their hazard assessments. While conducting the hazard assessment, employers must assess each employee's potential COVID-19 exposure but can do so generally. An employer could make a reasonable assessment based on commonalities of tasks, environmental factors, and work practices for one shift and prescribe the same protective controls and work practices to other shifts or exposure groups of employees with similar hazards and risk. For example, in a grocery store setting, an employer may not need to do an individual hazard assessment for each cashier because the COVID-19 hazards to which the cashiers are exposed would be the same. However, if a particular cashier has additional responsibilities (e.g., stocking shelves, cleaning and disinfecting carts and baskets, greeting customers), those tasks must be taken into consideration as part of the overall hazard assessment.

When conducting hazard assessments, employers should document the following information to assist them in developing and implementing their COVID-19 plans:

- Specific hazards or risk factors identified
- A plan to abate the identified hazards or risk factors in a timely manner
- Date(s) the assessment was performed

DRAFT

- The names and titles of the individuals who participated in the evaluation and contributed to the written plan
- A description of the actions to be taken
- Actions planned to address and prioritize mitigation of identified hazards or risk factors
- Identification of high-risk area(s), tasks, and occupations
- Communication of the status of planned or completed actions to employees who may be affected by the identified hazards or risk factors
- The dates by which planned actions are to be completed
- Written documentation of completed actions including:
    - What method(s) of control was/were decided upon
    - Area(s) where control(s) was/were implemented
    - Specific date(s) of completion
    - The names and titles of the individuals who authorized and managed implementation of control

When an employer identifies a COVID-19-related exposure hazard during the hazard assessment, the employer must implement controls to eliminate or mitigate the hazard, such as physical distancing, physical barriers when distancing is infeasible, face coverings, and cleaning and disinfection protocols. These hazard controls must be consistent with the relevant requirements in other paragraphs of this ETS. The employer must develop a reasonable plan to abate identified COVID-19 hazards.

OSHA acknowledges that some of the controls required under other paragraphs of this ETS may be potentially infeasible in some situations. However, even in cases where an employer can demonstrate that a particular control is appropriate but is not feasible, the employer should

DRAFT

still identify and implement alternative measures to protect employees from COVID-19 exposure(s) to the extent feasible. This ETS relies on a multi-layered strategy to minimize employee exposure to COVID-19, and each of the controls provide a layer of protection for employees. Therefore, when an employer is not implementing a control that is appropriate but is not feasible, the employer should take alternative abatement measures to account for the loss of that protective layer.

Situations where some of the controls required under this ETS may be infeasible might include where employees cannot maintain 6 feet of distance from all other people in the workplace and cannot remain behind physical barriers while providing services (e.g., restaurant servers, barbers). Similarly, in a construction or agricultural setting, employees may be in close proximity to others in an enclosed environment, such as on employer-provided transportation.

In these situations, employers should consider providing additional personal protective equipment (PPE) to their employees. For example, the employer could provide face shields and/or respirators. As explained in paragraph (f)(5) of the general section (paragraph (f)(4)(i) of the healthcare section), if an employer provides a respirator in lieu of the required face covering or facemask, then the employer must comply with the requirements under the COVID-19 Emergency Temporary Standard — Mini Respiratory Protection Program (29 CFR 1910.504, herein referred to as the mini respiratory protection program section). This ETS reduces the burden on employers and employees who choose to upgrade to a respirator by allowing them to use respirators pursuant to the mini respiratory protection program section. Additional information about the mini respiratory protection program section can be found in the summary and explanation for that section.

DRAFT

An employer might identify other hazards during its hazard assessment that warrant providing additional PPE to its employees, beyond what is required by other paragraphs of this ETS. Thus, an employer might conclude it should provide additional PPE to employees who frequently interact with people not wearing face coverings. For example, in restaurant settings, employees may have to frequently interact with customers who are allowed to remove their face coverings while dining. Additionally, there may be employees in healthcare settings to whom the employer would not be required to provide respirators pursuant to paragraph (f)(2) of that section because the employees are not exposed to a person with suspected or confirmed COVID-19. However, those employees may face increased likelihood of COVID-19 exposure because they work in an environment where people with COVID-19 may be present. An employer may also have an employee who has an underlying medical condition or other risk factors (e.g., chronic obstructive pulmonary disease, heart condition, pregnancy) that would place that employee at greater risk for severe illness if they get COVID-19 (CDC, February 22, 2021). In these situations, employers could consider upgrading the PPE provided to employees if their health condition does not prevent it.

Under paragraph (c)(5), the employer must seek the input and involvement of non-managerial employees and their representatives, if any, in the hazard assessment and the development and implementation of the COVID-19 plan. An employer can seek feedback from employees through a variety of means, including safety meetings, a safety committee, conversations between a supervisor and non-managerial employees, a process negotiated with the exclusive bargaining agent (if any), or any other similarly interactive process. Other tools that may be helpful for employers in soliciting feedback from employees may include employee surveys or a suggestion box. The method of soliciting employee input is flexible and may vary

DRAFT

based on the employer and the workplace. For example, a large employer with many employees may find a safety committee with representatives from various job categories combined with anonymous suggestion boxes to be more effective than individual conversations between supervisors and non-managerial employees. In the case of a unionized workplace, a safety committee established through a collective bargaining agreement may be the appropriate source for this input based on the definition and scope of the committee's work. In contrast, a small employer might determine that an ongoing interactive process between the employer and employees (e.g., regular safety meetings) is a more effective means of soliciting employee feedback.

The employer must monitor each workplace to ensure the ongoing effectiveness of the COVID-19 plan and update it as needed, as required in paragraph (c)(6) of the general and healthcare sections. For example, COVID-19 plans may need to be updated as more information about COVID-19 becomes available from the CDC, or state and local agencies. Additionally, the safety coordinator might learn of a deficiency during an inspection or from another employee. Any deficiencies identified must be immediately addressed, and re-training of all affected employees must occur.

Paragraph (c)(7) requires an employer's COVID-19 plan to address the hazards identified during the hazard assessment required by paragraph (c)(4), and to include policies and procedures in accordance with paragraphs (c)(7)(i) through (c)(7)(iv). The general and healthcare sections contain similar paragraphs at (c)(7)(i). Both require employers to develop policies and procedures to minimize the risk of transmission of COVID-19 for each employee, as required by various paragraphs in the corresponding sections (i.e., paragraphs (d) through (k) of the general section and paragraphs (d) through (n) of the healthcare section). Information about the

DRAFT

requirements of those paragraphs can be found in the corresponding summary and explanation sections. Each of these elements, when implemented together, provide multiple layers of protection for employees. As explained in the note to paragraph (c)(7)(i) of both the general and healthcare sections, although the employer's COVID-19 plan must account for the potential COVID-19 exposures to each employee, the plan can do so generally and need not address each employee individually.

Paragraph (c)(7)(ii) of the general and healthcare sections requires employers to include policies and procedures in their COVID-19 plans to minimize the risk of transmission of COVID-19 to employees from other people who enter the workplace. The COVID-19 plan must describe how employers will encourage or require these people to use face coverings when they enter the workplace. Additional information about face coverings can be found in the *Summary and Explanation* for face coverings. For example, employers may institute and post a policy prohibiting customer entry without a face covering, subject to narrow exemptions, in a similar manner that many employers require customers to wear shirts and shoes. Employers must encourage customers to wear face coverings, but if an employer selects a policy that allows customers to enter without face coverings then the employer's COVID-19 plan must provide additional protection for its employees to replace that important layer of source control (i.e., the customer's face covering). Employers must ensure that their employees stay at least 6 feet away from such persons where feasible, but when that is not feasible (because of space limitations or the actions of the non-employee) and that person is not wearing any face covering, it becomes even more critical that the employer have an alternate plan. The employer might instruct employees to remain behind a barrier at a fixed workstation (e.g., go behind a counter where a

DRAFT

barrier is located). Another way of an employer minimizing exposure when distancing is not possible would be to provide a supply of respirators to its employees.

The COVID-19 plan must also address how employees should respond in the event that people entering the workplace do not follow the employer's face covering policy and explain how the employer intends to minimize employee exposure to COVID-19 hazards when this happens. There are a range of policies employers could implement to address non-complying persons, including verbal engagement, refusal of service, denial of entry or asking the person to leave the premises, or, in extreme cases, request that security personnel or law enforcement intervene. In some settings, such as a retail establishment or grocery store, employers can instruct their employees to move to a location with a barrier as described in the previous paragraph. Or it may be necessary to ask individuals who refuse to wear a face covering to utilize alternative services, such as by asking them to complete their transaction using curbside pickup or delivery options. To be clear, OSHA does not expect employers to require their employees to enforce visitor/non-employee face covering policies in a manner that would place employees in physical danger of workplace violence – employers may request that customers without face coverings leave the premises or be considered trespassers, but if the customer refuses to comply, the employer need not require employees to physically bar or remove customers.

As explained in the note to paragraph (c)(7)(ii), the employer's visitor face covering policies and procedures may include exceptions to the face covering requirement for eating, drinking, or taking medication, for brief periods of time; obtaining a service (e.g., a medical or dental procedure) that requires removal of the face covering in order to perform the service; playing certain musical instruments; communicating, for brief periods of time, with a person who is hearing impaired when the ability to see the mouth is essential for communication; when

DRAFT

necessary to temporarily remove the face covering to verify one's identity (e.g., during security screening); or for a child under the age of 2 years. When visitor face coverings are mandatory, exceptions must be provided for a narrow subset of persons with a disability who cannot wear a face covering or cannot safely wear a face covering because of the disability, as defined in the Americans with Disabilities Act (42 USC 12101 et seq.). While most people with disabilities can safely wear a face covering, a small subset cannot wear a face covering because it could pose deadly risks. This includes people with severe disabilities who would not know to remove their face coverings if they are having difficulty breathing, are unable to independently remove their face coverings themselves, or cannot communicate promptly to someone else that their face coverings must be removed. The remaining portion of the subset who cannot wear a face covering may be exempted on a case-by-case basis.

Employers should also implement policies to protect employees who may encounter individuals who are excepted from the employer's face covering policy. Such policies could include relocating these individuals to a separate area away from others or providing more protective PPE to employees that must be in close proximity in order to translate for the hearing-impaired or perform security screenings. The employer's policies should conform to federal, state, and local public health laws, standards, and guidelines.

The provisions in paragraph (c)(7)(iii) address effective communication and coordination among employers. Specifically, these provisions prescribe the information-sharing responsibilities of employers who share the same physical location. OSHA intends this requirement to help prevent employees of one employer from creating hazards for employees of a different employer, and to facilitate information sharing between employers when one employer has the authority to address ventilation, barrier installation, or cleaning in an area

DRAFT

occupied by employees of a different employer. As explained above, physical location means a site, or an area within a site, where work or any work-related activity occurs. The full definition for *physical location* can be found in paragraph (b) of both sections. The provisions in (c)(7)(iii) are necessary to ensure that critical information sharing and coordination take place at all workplaces covered by the ETS.

When employees of different employers share the same physical location, paragraph (c)(7)(iii)(A) requires that each employer communicate its COVID-19 plan to all other employers present and coordinate to ensure that each of its employees is protected. Additionally, employers must adjust their COVID-19 plans to address any particular COVID-19 hazards presented by the other employer's employees who share the physical location. Paragraph (c)(7)(iii)(A) does not apply to delivery people, messengers, and other employees who enter a workplace only briefly to drop off or pick up items. For example, if an employee of a delivery company enters a workplace to deliver a package and then immediately leaves the workplace, the employers regularly present at the physical location (e.g., the employer receiving the package) and the delivery company do not need to communicate their COVID-19 plans in accordance with this paragraph.

Multiple employers working in the same physical location occurs in various industries. For example, there may be multiple employers present at the same construction worksite, including a general contractor and subcontractors in various trades (e.g., electrical, plumbing, framing work). In retail settings, different employers may own shops located inside a mall, or may have different office spaces within a multi-employer office building with shared common areas (lobby, bathrooms, elevators, etc.). Additionally, in a hospital setting, an employer might subcontract nursing or housekeeping tasks to other employers. In these examples, each employer

DRAFT

performing work at the site must communicate their COVID-19 plans to the other employers and coordinate with them to ensure all employees are adequately protected from COVID-19 exposure.

Paragraph (c)(7)(iii)(B) contains a notification requirement for employers with one or more employees working in a physical location controlled by another employer. Specifically, those employers must notify the controlling employer when their employees are exposed to conditions at the location that do not meet the requirements of this section. For example, if a subcontractor, or multiple subcontractors, with employees working on a construction worksite identify a potential COVID-19 hazard to which their employees are exposed, the subcontractor(s) must notify the controlling employer (e.g., the general contractor) of those conditions. Conditions that might not meet the requirements of this section that would need to be reported could include communal high touch surfaces (e.g., elevator buttons or bathroom facilities) that are not being adequately cleaned, or a physical barrier that has fallen down.

The communication and coordination provisions in paragraph (c)(7)(iii) of the general and healthcare sections are in addition to, and do not modify, OSHA's existing multiemployer citation policy, including a controlling employer's obligation to exercise reasonable care to detect and prevent violations on the worksite.

Lastly, paragraph (c)(7)(iv) includes requirements for employers whose employees enter private residences or other physical locations controlled by people not covered by the OSH Act (e.g., homeowner, sole proprietor). Employers with employees who need to enter private residences may include those providing plumbing, cable installation, residential contracting, or in-home maintenance or appliance repair services. These employers must include policies and procedures in their COVID-19 plans to protect their employees entering those locations,

DRAFT

including procedures for leaving the worksite if protections prove inadequate. Several methods of protecting employees are discussed in the technological feasibility section of this document. For example, a plumbing company might implement a screening procedure that includes contacting customers during the scheduling process, as well as upon arrival at a customer's home, to confirm that no one in the household is COVID-19 positive, has COVID-19 symptoms, or has recently been in contact with someone who is COVID-19 positive. When employees enter the location, the employees may set up a work perimeter with tape, barriers or other physical reminders to the homeowner to stay at least 6 feet from the employee. However, the employer must have procedures in place to protect its employees in the event the customer does not follow the reminders to stay at least 6 feet from the employee.

**COVID-19 Plan Summary and Explanation References**

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DRAFT

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United States Department of Labor (DOL). *Summary of the Major Laws of the Department of Labor.* https://www.dol.gov/general/aboutdol/majorlaws (DOL, 2020)

*Physical Distancing*

The virus that causes COVID-19 spreads mainly through droplet transmission between people who are in physical proximity to each other. Adequate physical distancing to prevent droplet transmission of infectious diseases is generally considered to be at least 6 feet, as addressed under *Need for the Specific Provisions* (Section V of the preamble). Therefore, paragraph (d)(1) of the general section and paragraph (h)(1) of the healthcare section require employers to ensure that each employee is separated from all other people by at least 6 feet. In cases where the employer can demonstrate that maintaining 6 feet of physical distance is not feasible for a specific activity, paragraph (d)(2) of the general section (paragraph (h)(2) of the healthcare section) requires the employer to ensure that each employee is as far apart as feasible from all other people in the workplace. The requirements of paragraph (d) (paragraph (h) in healthcare) do not apply to momentary exposure while people are in movement, such as when coworkers pass each other in a hallway or in a supermarket aisle. However, this exception has important limits, as discussed further below.

To determine when and where physical distancing is necessary in the workplace, employers must rely on the results of the hazard assessment performed under paragraph (c)(4) in both the general and healthcare sections. The hazard assessment requires employers to evaluate their workplaces to determine potential workplace hazards related to COVID-19. This evaluation will involve determining when, where, and under what circumstances employees come within 6 feet of other people during the course of their workdays or work shifts. After identifying where

DRAFT

this is occurring, employers must then implement, per their COVID-19 plans, policies and procedures to comply with the physical distancing requirement in paragraph (d) of the general section (paragraph (h) of the healthcare section).

To comply with the physical distancing requirements of the ETS, employers must ensure there is at least a full 6 feet of distance between each employee and any other person, such that neither person's body intrudes into that 6 feet of space. The employer must evaluate situations where employees are expected to come close to any other individuals, including coworkers, customers or other visitors, delivery or repair persons, and any other people present at the workplace. This includes situations where employees enter other peoples' homes to do their jobs, such as when a plumber enters a customer's home to install the plumbing for a shower or a real estate appraiser enters someone's house to estimate the property's value. It also includes situations where employees enter other businesses to perform their jobs, such as a vendor who delivers products to a retail store, or a repair person who works on equipment in commercial kitchens. In each of these scenarios, a physical separation of at least 6 feet must be maintained between the employee and other people, unless the employer can demonstrate it is not feasible.

Employers must also consider all areas accessed by employees when determining how to implement the physical distancing requirements. To be in compliance, an employer must ensure that 6 feet of distance can be maintained when employees are: at their workstations, whether they are fixed or mobile; arriving at and leaving a worksite; traveling within a worksite to their designated workstations; using locker rooms to change in and out of work clothing or PPE; using restroom facilities and break areas; and otherwise performing their work duties and activities incidental to those duties.

DRAFT

The note to paragraphs (d) of the general section and (h) of the healthcare section describes several ways employers can implement physical distancing that would be in compliance with this standard. OSHA recognizes that the provided list of examples is not exhaustive and that some options may be infeasible in some workplace settings. The agency also recognizes that physical distancing policies will need to be specific for each workplace. The note to the physical distancing provision is simply meant to provide a brief list of some of the primary options for physical distancing that employers are expected to consider in determining how to comply. For example, if an employee's job activities can be completed entirely remotely, then physical distancing could be easily maintained through telework or other remote work arrangements. Employers should maximize their reliance on telework or remote work whenever possible.

When employees have job activities that must be done on-site or on-location, other physical distancing approaches will be required. To comply with physical distancing requirements, employers may need to reconfigure workstations. Workstations could be spread out or relocated to more spacious areas to ensure that employees at the workstations are at least 6 feet away from each other. Workstations near high-traffic areas may need to be moved to places with less foot traffic if physical distance cannot be maintained. For example, an employer in an office setting could move a workstation located near a high-traffic walkway to a vacant office space or temporarily place it in an area with less foot traffic.

Shared work stations (e.g., control rooms, security checkpoints, nursing stations) may also need to be reconfigured to ensure physical distancing can be maintained. However, for shared workstations that require extended use over the course of a workday, it may be useful to schedule when employees can use those stations by adjusting the timing of their use or providing

DRAFT

alternative locations. For example, in manufacturing settings, control rooms are often shared, high-traffic workstations. Employers in these settings can consider limiting the number of employees who are permitted in the room at one time. In this situation, employers can also consider moving the location of some of the work normally done in the control room, such as permit signatures, planned outage meetings, and other tasks that do not necessarily have to take place in the control room, to a larger space or an outdoor space, in order to maintain physical distancing. In settings where security check-points are used, such as office building entrances or passenger screening areas at airports, stations can be spread farther apart or additional, unused desks can be utilized. Similarly, individual workspaces at nursing stations can be spread farther apart, and visual cues can be used to ensure nurses and other healthcare employees remain 6 feet apart when communicating.

For industries and workplaces that utilize shift work (e.g., construction, transportation, manufacturing), minimal-contact shift changes, in which employees maintain at least 6 feet of distancing during shift turnover, can be considered. For these shift transitions, detailed notes, virtual communications, and virtual oversight could be substituted for in-person contact to help ensure important processes are monitored and information is not overlooked. Shift changes at manufacturing facilities that involve a large number of people may be particularly challenging in terms of physical distancing. At these times, many employees may be entering or leaving through a limited number of doors or using the same equipment to clock in or clock out. It may also be foreseeable that weather conditions (e.g., rain, heat, cold) could result in employees congregating at facility entrances and exits. In these situations, employers can consider permitting employees to utilize additional entry or exit points, installing additional time clock equipment, or staggering arrival and departure times to limit employee interactions. Visual cues,

DRAFT

such as signs or floor markings, can be utilized in parking lots, sidewalks, lobbies, and other walking areas to designate clear entry and exit routes and to remind employees and non-employees to remain physically distant, especially during high-traffic times of the day.

Employers can also consider adjusting work processes or production practices to achieve physical distancing. In a manufacturing setting, this could include reducing production speed within a facility (i.e., slowing production lines) to ensure that employees are able to maintain 6 feet between themselves and others. Similarly, a fast food restaurant could reassign cooking and food preparation tasks in the kitchen so that meals can be prepared in a way that allows employees to maintain physical distance (e.g., incorporating an assembly line style, using designated stations for certain menu items).

If workstations and work processes cannot be physically rearranged in a way that allows 6 feet of distance at all times, employers must consider additional measures, such as reducing capacity and occupancy limits or altering work procedures. For example, in retail, restaurant, and other service settings, the following measures could help ensure compliance with paragraph (d) (paragraph (h) of the healthcare section): limiting the types of services provided; limiting occupancy in the establishment; allowing customers to pick up their order outside the store; installing visual cues (e.g., signs and floor markers) to remind employees and others to maintain 6 feet between individuals; enforcing one-way traffic flow; and using verbal public service announcements to remind employees and non-employees to practice physical distancing.

Changing work procedures and utilizing available technologies can also minimize or eliminate the necessity for close physical proximity between employees and other people. For example, employers may implement contactless transaction methods through mobile devices for ordering, payments, signing documents, and pick up and/or delivery confirmations. Similarly,

DRAFT

employers can consider adopting policies for booking reservations by phone or online, curbside pickup, and drive-through options to reduce the need for contact with customers. Phones or other visual recording and streaming devices may also be useful in manufacturing facilities to perform physically-distanced equipment and safety inspections. In healthcare settings, employers could maximize the use of telehealth to consult with patients and clients through phone or video visits, where appropriate.

Employers must also ensure that employees maintain physical distancing during meetings, trainings, and conferences. This could be achieved through the use of additional rooms to decrease group sizes or by scheduling these activities to occur virtually. Some events could be planned for outdoor venues, where it may be easier to maintain physical distancing. When on-site or hands-on training, such as specialized equipment training, is necessary, employers could consider holding one-on-one sessions instead of large group sessions to minimize exposure risk. An employer could also consider offering activities at multiple times to decrease the number of attendees in each session.

If ensuring physical distancing in compliance with paragraph (d)(1) of the general section (paragraph (h)(1) of the healthcare section) is not feasible given how work is currently scheduled, employers can consider staggering work shifts. This would result in fewer people in the workplace at a time, which should facilitate physical distancing. Employers may determine that modifying production or assembly lines and staggering employees across shifts would help to maintain overall manufacturing capacity while measures to minimize exposure to COVID-19 are in place. For example, in a manufacturing setting, a plant that normally operates on one daytime shift may be able to split employees into two or three shifts throughout a 24-hour period.

DRAFT

Employers can also consider scheduling employees for fewer, longer shifts instead of shorter, more-frequent shifts to minimize employee turnover within the facility.

Employers must also pay attention to physical distancing during break times and within common areas where employees normally congregate (e.g., water coolers, locker rooms). To maintain physical distance, employers may decide to replace or add to existing break areas by using training or conference rooms that provide more space for employees to spread out. Also, tables and chairs may be spaced out, removed, or blocked off to limit occupancy and create distanced seating arrangements. Chairs could be placed 6 feet apart and only on one side of a table to ensure employees are not facing each other while eating. An employer could also stagger break times to reduce the number of employees using those spaces at any one time.

Physical distancing must also be implemented in workplace restrooms and locker rooms. Some sinks, urinals, and stalls may need to be closed or blocked off to ensure adequate space is maintained. There may be certain times, such as during breaks, when the number of users outnumbers the facilities available given the imposition of the distancing requirement. Employers may find that additional restrooms or queues outside of restrooms are needed to ensure that an appropriate number of individuals are inside each restroom and that physical distance is maintained outside of those spaces. If queues are needed, visual floor markers may be useful to reinforce physical distancing requirements. If restrooms have lounge areas, removing lounge furniture can prevent people from congregating. In small facilities, employers may have to limit access to a small restroom to only one person at a time to maintain physical distancing.

Employers can also consider using outdoor facilities, such as pavilions or tents without sides, as break areas. Outdoor spaces are preferable to indoor work settings under many circumstances because the enhanced ventilation in most outdoor environments reduces the

DRAFT

chances of viral transmission. However, there are also circumstances where outdoor ventilation is insufficient. For example, if a location with two facing walls (e.g., an alley) has a strong crosswind overhead, air can become stagnant in that space. Similarly, in an alley or a tent with its sides down, air could be channeled in one direction, resulting in an infectious individual continuously delivering viral particles to uninfected individuals downwind. Therefore, physical distancing is essential even in outdoor settings and is required by paragraph (d)(1) of the general section (paragraph (h)(1) of the healthcare section).

Employers considering moving any job activities or break areas outside need to evaluate whether outdoor facilities would pose health or safety risks to employees, such as exposure to excessive heat or cold, humidity, or air pollution. For outdoor operations, such as outdoor dining or COVID-19 testing sites and vaccination centers, employers must also consider all reasonably foreseeable circumstances, such as ensuring that inclement weather does not impact the ability to maintain physical distance in accordance with the standard. For instance, consideration must be given to how to maintain distancing among employees if a weather event, such as a thunderstorm, a tornado, or excessive heat, would result in employees seeking shelter indoors. If outdoor facilities are utilized for breaks, such as in construction and agricultural settings, employers must ensure physical distancing policies are still enforced in those areas. An employer could use chalk, tape, or other markings to remind employees to remain at least 6 feet apart, or allow additional break time so that employees can walk to various outdoor locations to spread out.

As stated in paragraph (d)(1) of the general section (paragraph (h)(1) of the healthcare section), physical distancing is not required for momentary exposures while people are in movement. As discussed further in the *Need for Specific Provisions* (Section V of the preamble),

DRAFT

an employee generally needs to be both close enough to an infectious person and near them long enough to get an infectious dose of COVID-19. The time of exposure is cumulative; multiple short exposures over the course of a day can add up to a long enough period of time to receive an infectious dose of the virus. Therefore, OSHA interprets this exception for momentary exposures as applying only in situations where the momentary exposures happen on an infrequent or occasional basis. If an employee quickly passes another person in a hallway or aisle a few times a day, the distancing requirement of paragraph (d)(1) of the general section (paragraph (h)(1) of the healthcare section) would not apply. On the other hand, physical distancing would be required for short conversations in a hallway or at a cubicle, as well as in other situations involving frequent, brief contact.

Similarly, the exception for momentary exposures in paragraph (d)(1) of the general section (paragraph (h)(1) of the healthcare section) does not apply to two employees in a facility who repeatedly pass by each other to perform their tasks. For example, physical distancing (from employees and non-employees alike) is required on a construction site where employees are completing separate job tasks in close proximity to each other and in a healthcare setting where employees are regularly moving around to check on patients. Physical distancing is also required (i.e., the exception for momentary exposures does not apply) for food service employees in a restaurant setting (e.g., taking customer orders at a food service counter or waiting on tables) and for grocery store employees who are restocking products in an aisle of the store where they are passed regularly by customers and coworkers. If employees are working behind a counter where they must pass each other repeatedly during a shift, such as in a fast food restaurant, the employer must ensure employees maintain a physical distance of 6 feet in accordance with the standard. Ways to ensure physical distancing in such settings could include reallocating work

DRAFT

tasks so that cashiers do not have to leave their stations to retrieve food (e.g., assigning a food runner), redesigning work flow so that employees behind the counter do not travel to the same work station at the same time (e.g., placing items such as condiments and straws at individual workstations), and increasing distance between cash registers to more than 6 feet. Similarly, in jobs that require stocking shelves in a store, physical distancing of 6 feet could be maintained by scheduling stocking to happen before or after business hours, so that customers are not moving up and down the aisles close to the employees. Alternatively, individual aisles could be temporarily closed to customers and other employees while the stocking is being done.

Paragraph (d)(2) of the general section (paragraph (h)(2) of the healthcare section) applies if an employer can demonstrate that it is not feasible to maintain 6 feet of physical distance for a certain activity. In such cases, paragraph (d)(2) (paragraph (h)(2) in healthcare) requires employers to ensure that the employee is as far apart from all other people as feasible. The requirement in paragraph (d)(2) (paragraph (h)(2) in healthcare) recognizes that, even where 6 feet of distance cannot be maintained, keeping as much distance between people as possible can help lower the possibility of transmission of COVID-19, especially when combined with the other protections required by the ETS.

Paragraph (d)(2) (paragraph (h)(2) in healthcare) acknowledges that there will be situations in some workplaces in which maintaining 6 feet of distance at all times is not possible. For example, there may be situations where a room or other workspace is less than 6 feet in length and width and two employees must be in it at one time. This could include spaces in vehicles, such as an emergency response or law enforcement vehicle, or a sanitation or plow truck. If the employer can demonstrate that the space cannot be expanded, and that both employees must be in that space at the same time (i.e., that there are no other feasible alternatives

DRAFT

that would permit 6 feet of physical distancing), the employer satisfies its burden under paragraph (d)(1) (paragraph (h)(1) of the healthcare section) to demonstrate infeasibility. The employer would then be required, pursuant to paragraph (d)(2) of the general section (paragraph (h)(2) of healthcare), to ensure that as much distance as possible is maintained between the two employees in that space. The ETS also generally requires the employer to ensure the use of physical barriers at fixed work locations where each employee is not separated from all other people by at least 6 feet (see paragraph (e) of the general section; paragraph (i) of the healthcare section) and the use of face coverings, facemasks, or respirators (see paragraph (f) of the general section and the healthcare section).

In the context of a restaurant with table seating, employees, such as wait staff, will likely have to come within 6 feet of diners to deliver food and beverages to their tables. For those limited times, maintaining a physical distance of 6 feet between employees and customers is not feasible. However, under paragraph (d)(1) of the general section, employers are required to ensure that employees are at least 6 feet from other people whenever possible. Therefore, tables need to be spaced far enough apart throughout the restaurant that employees are not forced to come within 6 feet of diners when moving through the restaurant. When it is not feasible to ensure that employees are 6 feet away from diners and other employees when moving around the space, the employer must ensure they are as far apart as feasible under paragraph (d)(2) of the general section. Employees must also be instructed to remain at least 6 feet away from customers when they are taking their orders, and to wait until customers leave the restaurant to clear their tables when possible. Additional protection for restaurant employees may be provided by policies enacted in accordance with paragraph (c)(7)(ii) of the general section, under which

DRAFT

customers and other visitors may be instructed to wear face coverings (with exceptions for eating and drinking) (see also the note to paragraph (c)(7)(ii) of the general section).

Maintaining physical distance between a healthcare provider and patient is not always feasible when conducting an in-person exam or providing medical treatment, particularly within a small exam room. However, it is more likely that physical distance of 6 feet can be maintained when healthcare providers are asking patients questions about their medical history or problems they are experiencing. Again, the agency requires employers to ensure 6 feet whenever possible. However, employees who provide medical care will also be protected by other aspects of the healthcare section, including the use of facemasks or respirators and other PPE, depending on the circumstances, and cleaning and disinfection requirements (see paragraphs (f) and (j) of the healthcare section).

Other job duties that may require employees to be within 6 feet of others include jobs performed from an aerial lift, patient transport, operations security, multi-person maintenance tasks, confined space work, drilling rig work, trenching, scaffold erection, and shoring. Physical distancing of 6 feet may be difficult to maintain at all times in constricted areas behind fast food counters, even after the employer has reallocated work tasks or redesigned work flow to maximize distancing. In all cases, the burden is on the employer to demonstrate that it is infeasible to comply with the required physical distancing for a specific activity. And in such cases, employers must ensure that employees maintain as much physical distance as feasible under paragraph (d)(2) of the general section (paragraph (h)(2) of the healthcare section) and that physical distancing is layered with the other means of protection required by this standard (e.g., face covering use, cleaning of high-touch surfaces, installation of physical barriers).

DRAFT

Physical distancing may also be challenging to maintain at a shared worksite or shared facility. In such a case, coordination with other employers will be critical to determining when and where subcontractors or tradespeople should perform their tasks at the site. For example, in a construction setting, if multiple trade groups are working within the same site, employers could procure work plans from other groups to coordinate work areas and schedule job tasks so that crews are able to maintain physical distancing of 6 feet when feasible, and as much distance as possible at all other times. In addition, when employees operate or ride in work vehicles with other people in them (e.g., ambulances, shuttle buses), it might not always be possible to maintain 6 feet of distancing. Employers must first consider reducing capacity in the vehicle to allow for 6 feet of physical distancing under paragraph (d)(1) of the general section (paragraph (h)(1) in healthcare). When that is not feasible, employers must ensure that employees maintain as much distance as possible while in the vehicle (paragraph (d)(2) of the general section; paragraph (h)(2) of the healthcare section).

Another example where compliance with paragraph (d)(1) of the general section might be challenging is in manufacturing, factory, or industrial settings. In these settings, due to the placement and need for shared use of machinery or equipment, it may not be feasible to maintain physical distancing at all times. In such cases, employers must consider allowing employees to perform their job activities at different times (e.g., altering shifts) to provide more room for physical distancing. Employers must also consider other measures mentioned above, such as slowing line speed or adding a work shift, to allow for more space between employees. However, if the distancing requirement in paragraph (d)(1) of the general section still cannot be met, employers must maximize distance as much as feasible under paragraph (d)(2) of the general

DRAFT

section, utilize face coverings as required by paragraph (f), and install physical barriers in accordance with paragraph (e) of that section.

Although paragraph (d)(1) of the general section (paragraph (h)(1) of the healthcare section) requires employers to ensure physical distancing of at least 6 feet, respiratory droplets may at times be capable of traveling across longer distances, as discussed further in *Grave Danger* (Section IV of the preamble). However, as explained in the *Need for Specific Provisions* (Section V of the preamble) COVID-19 infections require exposure to a certain quantity of viral particles, and exposures beyond 6 feet involve exposure to fewer particles. Therefore, OSHA has concluded that a distance of 6 feet sufficiently minimizes viral transmission in conjunction with the other aspects of the layered infection control approach required under this ETS. While the agency requires that employers, at a minimum, ensure 6 feet of distance between people in the workplace, the agency also recommends that employers implement physical distancing of more than 6 feet whenever possible.

*Physical Barriers*

Physical barriers intercept respiratory droplets, which can contain COVID-19, and prevent them from being transmitted from person to person. As such, physical barriers are an important component of this ETS. Paragraph (e) of the general section requires employers to install cleanable solid barriers at each fixed work location where each employee is not separated from all other people by at least 6 feet of distance, except where the employer can demonstrate it is not feasible. A similar provision in paragraph (i) of the healthcare section requires barriers to be installed at each fixed work location outside of direct patient care areas where each employee is not separated from all other people by at least 6 feet of distance, except where the employer can demonstrate it is not feasible.

DRAFT

In both paragraph (e) of the general section and paragraph (i) of the healthcare section, the barriers must be sized (e.g., height, width) and located so that they block face-to-face pathways between the employee and other individuals, based on where each person would normally stand or sit. If necessary, barriers may have a pass-through space at the bottom to be used to pass items from one side of the barrier to the other. In healthcare and associated industries, physical barriers are not required in patient care areas or resident rooms, as stated in the note to paragraph (i) of the healthcare section.

Fixed work locations where barriers may be required under paragraph (e) of the general section include reception, circulation, help, ticketing, security, and customer service desks, as well as retail counters, where physical distancing of at least 6 feet cannot be maintained. Fixed locations where barriers may be required under paragraph (i) of the healthcare section include entryways, lobbies, check-in desks, admission desks, screening sites, intake and triage areas, pharmacy windows, and bill-payment counters; again, barriers would only be required for these work locations only where physical distancing cannot be achieved. For example, a barrier may be required at a nursing station if employees or visitors are not able to maintain 6 feet of physical distancing while at the nursing station.

DRAFT

In areas where direct patient care is not provided, barriers are required when individuals cannot maintain at least 6 feet of physical distancing. However, as noted following paragraph (i) to the healthcare section, physical barriers are not required in direct patient care areas, such as treatment rooms, examination rooms, and resident rooms in hospitals, long-term care facilities, rehabilitation facilities, hospice facilities, or other in-patient healthcare facilities. *Direct patient care*, as defined in paragraph (b), is hands on, face-to-face contact with patients for the purpose of diagnosis, treatment, and monitoring. The CDC does not recommend the installation of

barriers between healthcare professionals and their patients during direct patient care, so OSHA is not requiring them, even when they might be feasible. Employers in healthcare and associated industries may consider installing barriers in direct patient care areas if appropriate.

As part of the hazard assessment under paragraph (c)(4) of the general section (paragraph (c)(4) of the healthcare section), employers need to determine which job activities and fixed work locations require physical barriers. This involves a determination, for each fixed work location, of whether the employee(s) at that work location can be separated from other people by at least 6 feet of distance. The implementation of physical barriers in the workplace, including how many are needed, where they are needed, and how they should be installed, may vary with the size and type of the workplace, along with the work activities performed there. As such, the provision that requires physical barriers is presented in a manner that gives the employer flexibility to adapt the design, location, size, and materials of physical barriers to specific workplace conditions, policies, procedures, tasks, and layouts. Despite this performance language, employers must ensure that the barriers are installed when and where they are required, in accordance with paragraph (e) (paragraph (i) in healthcare), and that the barriers meet the other criteria in the provision, including those for material, location, and size.

Physical barriers are only required for fixed work locations when an employee is not separated from all other people by at least 6 feet of distance. A fixed work location is a workstation where an employee is assigned to work for significant periods of time, or at which the employee spends much of their workday or shift, even if they leave that workstation intermittently as part of their work. Although the employee may be required to move away from that fixed location to perform their job, in many cases they would be required to return to the fixed location throughout the day. Under paragraph (e) of the general section (paragraph (i) of

DRAFT

the healthcare section), physical barriers are not required at non-fixed workstations, such as may exist for servers in a restaurant, for farmworkers working in an agricultural field, or at construction worksites where employees are frequently moving around the worksite. In healthcare settings, non-fixed workstations may include when employees must move from patient-to-patient within a waiting room or check-in area to complete screening procedures. However, if these employees return to a central desk to complete the check-in process or to enter information into a computer for multiple patients, that desk would be considered a fixed work location and would require a barrier. Barriers are also not required in common areas where employees would pass each other, such as hallways or break areas, as these are not fixed workstations.

While barriers are only required at fixed workstations when physical distancing cannot be maintained, they can provide an important form of exposure control for a variety of employees. For example, in a retail setting, where employees are generally assisting customers while moving around the facility, barriers at fixed workstations may provide a useful control for employees to move behind for longer conversations with customers. Moreover, the requirements for the COVID-19 plan (paragraph (c)(7)(ii) of both the general and healthcare sections) specify that each employer must develop a policy for protecting its employees if a customer enters without a face covering. The policy may include the option for an employee to move to a fixed workstation where a barrier exists and stay behind that barrier while serving such a customer.

To be effective, barriers must prevent droplets from passing through them. Therefore, paragraph (e) of the general section and paragraph (i) of the healthcare section require barriers to be solid, meaning they must be impermeable to the droplets that are expelled when an individual is sneezing, coughing, breathing, talking, or yelling. The employer must immediately repair or

DRAFT

replace a barrier if it becomes damaged. Examples of solid physical barriers include clear plastic or acrylic partitions and sneeze guards, as well as temporary or permanent walls. In some situations, flexible, transparent plastic sheeting can qualify as a solid physical barrier, but only if it remains in place and blocks face-to-face pathways of air between the users on either side. It is critical that barriers block face-to-face pathways and that they do not flap or otherwise move out of position when they are being used. For example, if flexible plastic sheeting is installed between employees on a work line in a processing or manufacturing facility, but the sheeting could easily be swept out of the way in the course of an employee's work tasks or by ventilation, it would not comply with this provision. However, employers may use flexible plastic sheeting if it is installed in a manner such that it remains stationary and is unlikely to be disturbed during use enough to allow droplets to pass through that area (e.g., plastic sheeting hung between employees working on an assembly line and anchored – directly or via taut tethers or other devices – to a surface to prevent movement), or the sheeting is weighted or affixed to the ceiling and floor (or other fixture) to prevent its movement and improve stability.

In accordance with both paragraph (e) of the general section and paragraph (i) of the healthcare section, barriers must be made from materials that can be easily cleaned and disinfected. Replacement is also acceptable in lieu of cleaning. Since these barriers are intercepting respiratory droplets that may contain COVID-19, it is important to clean and disinfect them frequently. Impermeable materials like plastic or acrylic are easy to clean and disinfect. Cleaning and disinfection of physical barriers should occur in accordance with requirements in paragraph (g) of the general section (paragraph (j) of the healthcare section). Cleaning and disinfecting products should be chosen to be compatible with the barrier material

DRAFT

used. If the cleaning and disinfecting products selected are not compatible with the barrier material, the barrier may become damaged and would then need to be replaced.

Where appropriate, barriers may be made of easily replaceable materials, such as flexible, clear plastic sheeting. Using replaceable materials would allow an employer to dispose of and replace barriers between uses, instead of cleaning and disinfecting more permanent barriers. Barriers constructed out of materials like cloth fabric or mesh would not comply with paragraph (e) (paragraph (i) in healthcare); these materials are not impermeable and would allow respiratory droplets to pass through them.

Employers must design and install physical barriers in a manner that ensures that, given their positioning, height, and width, the barriers can effectively prevent droplet transmission. Essentially, the barriers must be designed and installed such that any person cannot cough, talk, or breathe on an employee when the employee is in their normal sitting or standing location relative to the workstation. Therefore, the effective design and implementation of physical barriers will differ between workplaces based on job tasks, work processes, and even potential users.

As noted above, paragraph (e) in the general section (paragraph (i) in the healthcare section) requires barriers to be sized and located so that they block face-to-face pathways between individuals effectively, based on where each person would normally sit or stand. When the individuals on both sides of the barrier will be sitting, the barrier must be high enough, and extend far enough, to block face-to-face pathways between those seated individuals effectively. To ensure compliance with the size and location requirements, employers must account for where the breathing zones of the users on both sides of the barrier will likely be, as a barrier is only effective at reducing an employee's exposure to COVID-19 if it keeps respiratory droplets

DRAFT

out of the employee's breathing zone. As described in the *Need for Specific Provisions* (Section V of this preamble), OSHA defines the breathing zone as the area from which a person draws air when they breathe; it extends 10 inches beyond a person's nose and mouth. The location of that breathing zone is critical to designing compliant barriers because of the requirement that barriers block face-to-face pathways between the individuals on both sides of the barriers.

The height of employees and other individuals separated by barriers impacts where their breathing zones will be located, as does whether those individuals will be sitting or standing when at the fixed work location. These factors must, therefore, be taken into account when determining the size and location of each barrier in order to comply with paragraph (e) (paragraph (i) of the healthcare section). If employers are certain that only specific employees will be at a particular fixed work station and will not be exposed to other people (e.g., customers) of varying heights, then the barrier can be tailored to those factors (i.e., employers can tailor the barrier height to the height of the employees that use that particular workstation). However, in the vast majority of cases, the heights of employees and customers will vary and, and employers must construct their barriers to at least address average heights. The average height of adults in the US is 63.6 inches for women and 69 inches for men (CDC, May 20, 2020). Employers should consider the height of typical users and their breathing zones to design and install barriers in a way that ensures face-to-face pathways are effectively blocked. Note that OSHA is not mandating a specific barrier height and enforcement will focus on whether the barrier blocks the breathing pathway. For example, for employers who do not know the heights of the people who are likely to be separated by a barrier, OSHA will accept as compliant a barrier that extends to at least 6 and a half feet above the surface on which both people are standing, as this would block face-to-face transmission at the average heights for both females and males while also

DRAFT

accounting for their breathing zones. Depending on the job tasks, workstation design, and typical user height, barriers may be able to be shorter (e.g., if both users are sitting) or may need to be taller (e.g., a person is standing on an elevated surface) to ensure that they block face-to-face pathways between users.

If the barrier is installed on a table, desk, countertop, or other surface above floor height, the height of those items would be included in the barrier height. If one user may be sitting and the other may be standing, barriers should be high enough to reflect the height of the standing user as well as the sitting user. The average sitting height of users will vary based on chair height and type, and employers should consider the workstation design when implementing physical barriers. If employees utilize sit-and-stand workstations, barriers would need to be designed to block face-to-face pathways of employees in both sitting and standing positions. If that is not possible, employers should consider suspending the use of sit-and-stand workstations during the pandemic.

To meet the requirement for the barrier to be sized (e.g., height and width) and located to block face-to-face pathways based on where individuals would normally stand or sit, the physical barrier must extend far enough along the workstation to fully contain respiratory droplets that are expelled during sneezing, coughing, breathing, talking, or yelling. In addition to being sufficiently tall, barriers need to be wide enough to protect users on either side during the entire interaction. To ensure compliance, employers also need to consider predictable behaviors and movements of employees and non-employees when designing and installing barriers. The part of paragraph (e) (paragraph (i) in healthcare) that refers to where each person would normally stand or sit is meant to ensure employees are protected in the event users behave in a way that would reduce the effectiveness of the physical barriers, such as moving to the side of, around, or above

DRAFT

the barrier. If such behaviors are predictable, and are not taken into account when designing the barrier, the barrier would not be compliant.

For example, at a service counter, the barrier must be wide enough to block the face-to-face pathway between an employee and a patron when the employee and patron are positioned directly across from each other. In situations where the employee and the patron are positioned diagonally across from each other but still within 6 feet, the barrier must still extend to block those diagonal face-to-face pathways. At counters where an employee and patron may move together along the counter to view or select products (e.g., delis, bakeries, etc.), employers can either use signage or floor markings to direct patrons to stand in a particular location behind a barrier or place barriers along the entire length of the counter.

In a manufacturing setting, barriers must be wide enough to block the face-to-face pathway between employees who are facing each other across the production line, even if workstations are not directly across from each other. This is especially critical when employees may need to move back and forth along the line to do their job tasks. However, if two employees have multiple fixed workstations on opposite sides of the line such that they are always at those fixed locations except for brief movements in between, then the barriers must be arranged to block the face-to-face pathways between the workstations that are less than 6 feet apart. The barriers do not need to block all of the face-to-face pathways while employees are briefly moving between the fixed workstations.

In a retail setting, a barrier would likely be necessary to separate employees from non-employees at cashier stations. Barriers must extend far enough to cover the area where payment machines and cash registers are located to ensure that both users' breathing zones are behind the barrier during the entire transaction and to avoid users moving around the barrier at any point

DRAFT

during the transaction. In these settings, there must be a barrier between the cashier and the customer at the counter space where the products are scanned. If the customer has to move away from that barrier to access a credit card machine in a manner that would result in a face-to-face pathway between the customer and cashier, the barrier must extend to block those pathways. If there is a separate bagging area where it is infeasible to have a barrier separating the employee from the customer, only one person (e.g., the customer or the employee) should be in that location at a time (the other must stay 6 feet away). Employers should also consider visual reminders, like floor markings or signs, to remind employees and non-employees not to step around or move to the side of or above the barrier when interacting with an employee.

Additionally, when designing barrier placement and implementation, employers should consider if and how the barrier could alter communication between users. If a barrier is required, but may interfere with effective communication between individuals (e.g., when working with individuals who are hard of hearing, when working in an environment with significant background noise), no-pass through speaking or electronic communication devices could be installed. Slotted speaking grates should not be installed in the barrier, as this would allow droplets to pass through the barrier.

Paragraph (e) of the general section (paragraph (i) of the healthcare section) allows the barrier to have a pass-through space at the bottom for objects and merchandise. This limited exception to the requirement for the barrier to be solid applies when employees or others need to pass items to someone on the other side of a barrier. For example, when health screening is utilized at a workplace, to screen either employees or non-employees before entry, a barrier could be installed to separate the employee conducting the screening from other individuals. A small pass-through space could be used to facilitate the passing of items between users, such as

DRAFT

medical screening questionnaires or COVID-19 testing materials. Such openings should be as small as possible for the given job tasks and activities, and openings should not be placed in front of the breathing zone of any user.

In a retail setting, where a barrier extends down to a counter, such a space should normally be placed at the bottom of the barrier, just above the counter. However, the employer needs to consider the positioning of the individuals on both sides of the barrier before determining where the pass-through space should be located. For example, if a standing user is required to pass items to a seated user on the other side, the pass-through space must not be placed in front of either user's breathing zone. Instead, the opening could be installed to the side of the seated individual. In situations where the barrier extends to the floor, the pass-through space may be located in the middle of the barrier, as long as it is below or to the side of the breathing zones of both users and still effectively blocks face-to-face pathways.

Barriers with pass-through spaces may also be required, when feasible, for workplaces where the employee must have physical contact with a customer or other individual. For example, in a nail salon, a barrier must be installed to separate the employee working on a customer's hands from the customer. However, the barrier will likely need a pass-through space, away from the breathing zones of both users, to allow the customer to reach under for the employee to complete the services required on the customer's hand. Similarly, a pass-through space may be utilized at a police station for taking fingerprints.

In some cases, when the items being transferred are large (e.g., at a food service window, or a package or parcel counter), a sliding door may be installed to ensure the effectiveness of the barrier. If a sliding door or is used, it must be kept closed except when necessary to transfer an item. As an alternative, work processes can be established to take turns placing and picking up

DRAFT

large items from a location to the side of a barrier in order for users on either side of the barrier to maintain 6 feet of physical distance. In addition, employers must ensure that this high-touch surface is cleaned frequently, in accordance with paragraph (g) of the general section (paragraph (j) of the healthcare section). Ventilation should also be considered with respect to these pass-through spaces to ensure that the air in one workspace is not funneled through these openings and directly into another person's workspace.

Physical barriers are typically mounted on hard surfaces or designed to be free-standing. However, there may be circumstances where an employer may decide to utilize a hanging barrier, depending on the surface below or the work tasks being completed. Barriers may be hung from above, such as from the ceiling or other fixture, as long as they remain stationary and are unlikely to be disturbed during use. Barriers that sway back and forth or do not fully block face-to-face pathways, whether attached from below or hung from overhead, would not comply with this provision. In a manufacturing setting, barriers may need to be hung from above and extend down between employees if equipment or processing lines would interfere with other installations. Hanging barriers may also be appropriate in situations where pets or children may be present, such that alternate barrier installations present safety hazards or risks related to barriers falling down. Where hanging barriers are used above a counter or other surface that is raised above the floor, they should extend down as close to that surface as possible, allowing a space for passing items where necessary. If barriers are hung from the ceiling but do not fully extend to the floor or counter, policies should be developed to ensure employees are not placing personal items (e.g., backpacks, umbrellas, cellphones) on the floor or counter below the barrier where they could be contaminated by droplets that land under the barrier. For the same reason, employers must ensure that the surface below the barrier is frequently cleaned in accordance

DRAFT

with the cleaning and disinfection provisions in paragraph (g) of the general section (paragraph (j) of the healthcare section).

While barriers provide protection to employees from COVID-19, their design and installation must also consider employee safety. In the event of an emergency, employees must be able to quickly leave their work area, with their entry and exit not hindered by a physical barrier. Building and fire safety should be considered when installing barriers. Barriers must not block safety features, such as smoke detectors, sprinklers, carbon monoxide detectors, fire extinguishers, or fire alarms. Employers must properly secure large barriers that could fall and injure an employee. Depending on the size and placement of the barrier, temporary adhesive may be necessary to keep the barrier securely in place. If barriers are mounted on floors, employers should ensure barriers do not present trip or fall hazards to employees.

In retail or other service settings, barriers must be installed to protect employees at fixed work locations not separated from others by at least 6 feet of physical distance, such as cash registers and point of sale stations. Small pass-through spaces at the bottom of the barrier along the counter would allow for the transfer of items and money. This configuration would also be applicable for payment areas in restaurant, cafeteria, bar, and other food service settings. Restaurants must also install barriers at other fixed work stations where it is difficult for employees to maintain physical distancing with other employees or restaurant patrons.

There are some settings where fixed workstations may not include a standard desk or counter, but barriers would still be necessary. For example, in a hair salon or barber shop, barriers are required between chairs or service stations, if physical distancing cannot be maintained. While barbers and stylists must have physical contact with their own customers, barriers between chairs protect the barbers and stylists from coming into contact with respiratory

DRAFT

droplets from other employees and customers being served by other employees. In a nail salon or tattoo parlor, barriers should be installed between employee workstations where physical distancing cannot be maintained.

In office settings, physical barriers must be used to separate employees at fixed workstations who are within 6 feet of each other, and anywhere else it is difficult to maintain physical distancing with coworkers, customers, patients, or other non-employees in the workplace. Where it is not feasible to relocate workstations to provide 6 feet of distancing from others, such as for workstations near high traffic areas or places where people queue, employers must install physical barriers. This may include reception desks or other fixed workstations, such as cubicles. Cubicle walls that block the face-to-face pathways of employees at a fixed workstation and that meet the design specifications outlined for this provision would be considered sufficient physical barriers. Cubicle walls do not need to extend to standing height as long as the cubicle walls block the face-to-face pathways between that employee and other individuals and other individuals do not come within 6 feet of the employee while in their cubicle. It is not necessary to install a physical barrier beyond the height of the cubicle wall to prevent brief face-to-face pathways that may occur while the employee or neighboring employees leave or enter their respective cubicles. Administrative controls, such as prohibiting face-to-face conversations within cubicle wall or directing traffic away from workstations, can reduce the need for barriers beyond the height of cubicle walls in these situations. If an employee is inside a cubicle and others must stand within 6 feet, physical barriers must be installed to block the face-to-face pathways that would result from these interactions.

In industrial, food processing, and manufacturing settings, barriers would be needed to separate employees from each other where physical distancing cannot be maintained,

DRAFT

including where employees need to perform tasks in tandem across from one another. In many cases, it will be possible to position barriers to protect employees while still allowing work processes to continue. Barriers may need to be adjusted to efficiently integrate them with the processing line and other workplace equipment. For example, in a meat or poultry processing facility, barriers must be used to separate employees, including those who work across from each other or next to each other. A properly secured barrier could be installed above the processing line in a way that blocks face-to-face pathways, but still allows materials to flow through below, such as described in guidance for Manufacturing Workers and Employers issued jointly by the CDC and OSHA (CDC and OSHA, February 5, 2021).

In educational settings, barriers could be used to separate instructors from students when an instructor is at a fixed work location and 6 feet of distancing cannot be maintained. This could apply in classrooms and shared spaces at schools, colleges, and universities, and in large conference rooms and other instructional facilities. In a classroom, this may mean installing a barrier in front of where the instructor would typically lecture or teach, but only where students must sit within 6 feet of the instructor.

In industries like construction, repair services, oil and gas, and agriculture, barriers must be installed when an employee needs to occupy specific areas of indoor work sites where they are unable to maintain 6 feet of physical distance from other employees. Similarly, if multiple trade groups must work closely together on one worksite, barriers must be used to separate work crews or individual employees from one another where feasible. In cases where employees and others do not have to see each other, barriers do not have to be transparent. For example, in a construction setting, a temporary wall may be used to separate employees working in a construction site from members of the public. Barriers could also be made of wood or metal,

DRAFT

as long as they follow design specifications outlined for this provision. Employers must install barriers in a manner that does not create additional safety hazards, such as reduced visibility or ability to communicate in or around work vehicles, heavy machinery, or other equipment, or they must provide alternative means of protecting employees from those hazards (e.g., additional communications protocols or devices). In settings where sparks or flames may be present, employers must ensure that the barriers are not constructed from flammable materials. In these situations, employers should consider the use of welding curtains, which could also constitute a physical barrier under this provision.

OSHA recognizes that there are many employees who will be protected by barriers only for part of their work shift. For example, some employees have a fixed workstation but have to move back and forth from those fixed areas, such as workers behind a retail or food service counter who move from a register to pick up food orders. In these settings, barriers would be required at the counter to separate employees from customers, as well as between the fixed cashier workstations if 6 feet of physical distancing is not possible between cashiers. In these situations, employers should consider redesigning or adjusting workflow to ensure employees can maintain 6 feet of physical distancing from each other. For example, instead of one employee serving as a cashier and filling food orders, employers may assign one employee as the cashier and a different employee to fill food orders. Alternatively, the employer may redesign the workspace to allow a cashier to leave the cash register to fill food orders in a manner that does not require them to move within 6 feet of another employee When an employer can demonstrate that neither of those options can be done without a significant restructuring of fixtures or adding staff, OSHA would not require barriers to extend back into the space behind the counters to separate the cashiers when they leave the counters to perform their expected tasks.

DRAFT

Barriers serve as a particularly important control when employees are exposed to many different people, each a potential carrier of COVID-19 and the barriers must be provided at fixed workstations even if the employee also has tasks that cannot be performed behind the barrier. The barrier can still reduce the duration of exposure and potentially also the number of sources of exposure the employee faces in the workplace. In a restaurant setting, for example, a barrier is required at a fixed host station, even though the host will likely move from that fixed workstation intermittently to seat guests at tables. It would be infeasible to protect the host with a barrier for the entirety of that process. Similarly, a high school teacher may have a fixed workstation in their classroom where a physical barrier would be required even if the teacher may move around the classroom to provide instruction and assistance to individual students.

In an industrial or manufacturing setting, barriers would be required between employees at fixed workstations throughout the facility, but not around shared work items or equipment that employees use temporarily, like a parts bin or piece of equipment at a fixed work station. In these situations, employers should implement policies that ensure employees still maintain at least 6 feet of physical distancing, such as allowing only one employee at a time to utilize that item.

During these scenarios, barriers are not required when the employee moves away from their fixed workstation, but the other controls required by this standard, such as face coverings/face masks, physical distancing, and cleaning and disinfecting shared equipment play a vital role in reducing employee exposure. Further, in these types of circumstances, employers must also consider additional controls, such as rearranging work flow to minimize the time an employee has to spend outside of the barrier, or reducing the number of employees at non-fixed

DRAFT

work stations at a time, to ensure that the other protections required by the ETS are implemented to the extent feasible.

OSHA also recognizes that some employees may have locations that they go to frequently but may not qualify as a fixed workstation due to the employee's frequent movement throughout the workplace during their work day or shift, and thus physical barriers would not be required. For example, employees in a shipping facility, whose primary job task is to retrieve items and deliver them to a conveyor belt would not need to treat the conveyor belt as a fixed work station if the vast majority of their time is spent moving around the facility away from the belt. Thus, the employer would not need to erect barriers at the conveyor belt just to separate employees when they approach the belt to place an item on it. But barriers would be required when they are standing for a significant time at the conveyor belt next to a co-worker.

Many teachers and child care employees who work with young children may meet this criteria, as they frequently move around the classroom throughout the day to instruct and care for children. Although the teachers may have a place in their classrooms where they can sit to complete more stationary tasks, such as filling out paperwork, that location would not qualify as a fixed location if the teacher or child care employee does not spend much time in that place or return to it consistently throughout the work day.

Under paragraph (e) in the general section and paragraph (i) in the healthcare section, employers are exempt from compliance with the requirement to install physical barriers when the employer can demonstrate that the use of barriers is infeasible. For example, in an industrial or manufacturing setting, barriers may be infeasible if they would interfere with the safe operation of equipment at fixed work stations, such as equipment along an assembly or production line. Barriers may not be feasible during certain tasks that require multiple employees to work

DRAFT

cooperatively within 6 feet of one another in a fixed location for an extended period of time, such as in a construction setting when installing drywall or in an offshore oil and gas setting. At some fixed workstations, such as in the back-of-house of restaurants, a barrier may not be feasible between employees due to open flames. In agricultural or veterinarian settings, barriers may not be feasible when multiple employees have to cooperatively provide hands-on animal care for an extended period of time, such as during a veterinary procedure or examination. There may be some work settings where two employees must ride in a shared work vehicle and operate shared controls, such as in a snow plow or ambulance, where barriers would also be considered infeasible as it would be too difficult to install or would block access to the shared controls that both employees need to access. Finally, the agency notes that where barriers are infeasible, it is particularly important to implement the other controls required by this standard, such as face coverings/facemasks, and cleaning and disinfecting are critical to the layered approach of the ETS in reducing employee exposure.

Please see the *Technical Feasibility* section for additional information about barrier installations in different scenarios.

DRAFT

**Physical Barriers References:**

Centers for Disease Control and Prevention (CDC). (2020, May 20). *Body Measurements*. https://www.cdc.gov/nchs/fastats/body-measurements.htm (CDC, May 20, 2020)

Centers for Disease Control and Prevention (CDC) and the Occupational Safety and Health Administration (OSHA). (2021, February 5). *Manufacturing Workers and Employers*. https://www.cdc.gov/coronavirus/2019-ncov/community/guidance-manufacturing-workers-employers.html (CDC and OSHA, February 5, 2021)

*Face Coverings*

The benefits that result from the use of face coverings for preventing transmission of COVID-19 are derived from the combination of source control (i.e., reducing the spread of large

respiratory droplets to others by covering an infected person's mouth and nose) and some personal protection for the wearer (discussed in detail in the *Need for Specific Provisions* (Section V of the preamble)). Face coverings are a vital layer of protection, and the benefit to any given individual increases with increasing community use. Paragraph (f) of the general section contains requirements for the use of face coverings, as well as alternatives to face coverings (e.g., face shields, respirators) that may be acceptable in some situations (described in detail below). As defined in paragraph (b), a *face covering* is a product worn on the face specifically covering at least the wearer's nose and mouth with the primary purpose of providing source control by reducing the number of expelled droplets and aerosols from the wearer's nose and mouth into the air, and to provide a degree of particulate filtration to reduce the amount of inhaled particulate matter. This definition includes face coverings that otherwise meet the definition of face covering under paragraph (b), but are constructed of clear plastic (or include clear plastic windows), such as those utilized by persons communicating with those who are deaf or hard-of-hearing or when seeing a person's mouth is otherwise important. Face coverings can be manufactured or homemade, and they can incorporate a variety of designs, structures, and materials. They do not require any kind of FDA certification.

DRAFT

Paragraph (f)(1) of the general section requires employers to provide, and ensure that employees wear, face coverings that meet the definition in paragraph (b) of that section, are made of at least two layers of fabric that is either a tightly woven material or non-woven material, and have no visible holes or openings in the material (e.g., face coverings with valves are prohibited).

Paragraph (f)(2) of the general section requires employers to provide a sufficient number of face coverings to each employee, as necessary to comply with the paragraph, and to ensure

face coverings are worn by each employee over the nose and mouth when indoors, when outdoors and less than 6 feet away from another person, and when riding in a vehicle with another person for work purposes. If an employee is outdoors and cannot consistently maintain a distance of at least 6 feet from another person, the employee must wear a face covering. To be worn properly, face coverings need to completely cover the wearer's mouth and nose, and fit snugly against the sides of the face without gaps. Face coverings with a nose wire help to avoid issues with glasses fogging and create a snug fit. Employers must ensure employees receive training on when and how to properly wear a face covering in accordance with paragraph (k) of the general section. To provide additional reminders for employees, employers may consider utilizing public service announcements or displaying signs or posters throughout the facility about proper face covering usage. Additionally, to ensure face coverings are worn properly, an employer might appoint a manager or senior employee to check that each employee is properly wearing a face covering at the start of and throughout each shift.

Paragraph (f)(2) also states that when an employee provides their own face covering that meets the criteria in paragraph (f)(1), the employer may allow the employee to use it instead of using an employer-provided face covering. While employers are required to provide face coverings to employees at no cost, as described in paragraph (m) of the general section, employers are not required to reimburse employees for employee-provided face coverings.

Whether an employer has provided a sufficient number of face coverings to each employee to comply with this paragraph depends on a number of factors. Employers have discretion under the general section to provide disposable face coverings or reusable face coverings. In all cases, whether the employer provides disposable or reusable face coverings, the employer must ensure that employees change face coverings at least daily and whenever they are

DRAFT

soiled or damaged. Thus, as specified in paragraph (f)(2)(i), employers providing disposable face coverings must ensure that each employee changes them at least once per day and whenever they are soiled or damaged. And, in accordance with paragraph (f)(2)(ii), employers providing reusable face coverings must provide clean face coverings at least daily and replace the face covering if it is soiled or damaged, or more frequently if specified by the manufacturer.

Face coverings can become soiled by splashes, sprays, or splatters, from contact with a contaminated surface, or by touching/adjusting them with contaminated hands. Reusable face coverings may become degraded or damaged over time with frequent cleanings. Damaged face coverings may not fit properly and thus will have reduced effectiveness. Employees that work where there is potential for spills, sprays, or splashes may need to change or replace their face coverings more frequently (e.g., in food, meat, or poultry processing plants; water, sanitation, or wastewater treatment facilities; or restaurants). In these settings, employers may consider providing supplemental face shields to wear over face coverings, which would reduce the frequency with which face coverings become wet or soiled and the rate at which employees would have to change face coverings during the day. For work where face coverings are expected to become dirty or soiled less frequently, employees may only need to replace their face coverings daily (e.g., in retail or office buildings). However, even in those situations, employers must provide extra face coverings for employees if any do become soiled or damaged in the course of a work day; replacements should be available in readily accessible locations (e.g., locations that are convenient for employees, such as at security checkpoints, in employee breakrooms, or near employee workstations).

As noted above, when employers choose to provide employees with reusable face coverings, the employer must provide a clean face covering at least daily. Face coverings can

DRAFT

become soiled after each use and may be contaminated with bacteria and viruses, including the virus that causes COVID-19. To ensure performance and minimize the risk of contaminating employees after contact with a soiled face covering, as described previously, the CDC recommends washing them whenever they get dirty, but at least once a day (CDC, October 28, 2020). A note to paragraph (f)(2)(ii) explains that employers may permit employees to clean and maintain the reusable face coverings provided by the employer. Given the intimate nature of face coverings, employees may prefer to maintain control of their employer-provided face coverings, including doing all required cleaning. As required by paragraph (k) of the general section, all employees must be trained on the employer's policies and procedures regarding how to properly care for, store, clean, maintain, and dispose of face coverings, thereby enabling employees to clean and maintain the reusable face coverings themselves, if they choose.

Paragraph (f)(3) of the general section contains exceptions to the face covering requirements contained in paragraph (f)(2) of the section. First, an employee who is alone in a room is not required to wear a face covering. However, if the employee exits the room or another individual enters the room, face coverings are required (paragraph (f)(3)(i)).

Under another exception, employees are not required to wear face coverings while eating or drinking at the workplace, as long as they are at least 6 feet from others or separated from others by a physical barrier (paragraph (f)(3)(ii)). Employers may accomplish this by staggering break times, allowing use of non-traditional break areas (e.g., conference rooms), or letting employees eat or drink outside where there may be more space. See discussion in the *Summary and Explanation* for paragraphs (d) and (e) of the general section for additional information on physical distancing and physical barriers, respectively.

DRAFT

The next exception, described in paragraph (f)(3)(iii), provides that face coverings are not required for employees who are wearing respiratory protection in accordance with 29 CFR 1910.134 or paragraph (f)(5) of the general section. Employees required to use respiratory protection in accordance with 29 CFR 1910.134 for certain workplace hazards unrelated to the COVID-19 pandemic are exempt from the face covering requirements in paragraph (f)(2) while they are wearing respirators; for example, painters in a variety of industries are required to wear respirators in accordance with 29 CFR 1910.134. Additionally, employees using respirators in compliance with the mini respiratory protection program section for voluntary respirator use are also exempt from the face covering requirements in paragraph (f)(2) while they are wearing respirators (see discussion of paragraph (f)(5), below). OSHA notes that the general section does not require employers to provide and ensure employees use respiratory protection in connection with the COVID-19 hazard, but respiratory protection is required in certain circumstances in the healthcare section. A more detailed discussion is provided in the *Need for Specific Provisions* (Section V of this preamble).

Paragraph (f)(3)(iv) contains another exception for face covering use when it is important to see a person's mouth (e.g., communicating with a hearing-impaired person) and the conditions do not permit a face covering that is constructed of clear plastic (or includes a clear plastic window). OSHA notes that the definition of face covering in paragraph (b) includes face coverings that otherwise meet the definition of face covering but are constructed of clear plastic (or include clear plastic windows). If a face covering with a clear plastic window is not feasible under the circumstances, the employer must ensure that each employee wears an alternative for their protection, such as a face shield, if the conditions permit it.

DRAFT

Paragraph (f)(3)(v) contains an exception for when employees cannot wear face coverings due to a medical necessity, medical condition, or disability as defined in the Americans with Disabilities Act (42 U.S.C. 12101 *et seq.*). The exception for people with disabilities applies to a narrow group of individuals with severe disabilities for whom wearing a face covering would pose deadly risks, including those who would not know to remove their face coverings if they are having difficulty breathing, those who are unable to independently remove their face coverings themselves, or those who cannot communicate promptly to someone else that their face covering must be removed. The remaining portion of the subset who cannot wear a face covering may be exempted on a case-by-case basis. In all such situations, the employer must ensure that each employee wears a face shield for the protection of the employee, if their condition or disability permits it.

Under another exception, contained in paragraph (f)(3)(vi) of the general section, a face covering is not required for an employee if the employer can demonstrate that the use of a face covering presents a hazard to the employee of serious injury or death (e.g., arc flash, heat stress, interfering with safe operation of equipment). This exception ensures employees remain protected from other potential or known workplace hazards that could lead to injury. In such situations, the employer must ensure that each employee wears an alternative to protect the employee, such as a face shield, if the conditions permit it. OSHA notes that specialized face coverings, or other specialized equipment that does not meet the definition of face covering in paragraph (b) may be available to protect against the relevant hazard and also allow effective protection against COVID-19. For example, flame resistant face coverings made from aromatic polyamides or modacrylics are commercially available for situations in which there are flash fire or arc flash hazards. Paragraph (f)(3)(vi) emphasizes that any employee not wearing a face

DRAFT

covering under this exception must remain at least 6 feet away from all other people unless the employer can demonstrate it is not feasible. Finally, under this exception, the employee must resume wearing a face covering when not engaged in the activity where the face covering presents a hazard.

The final exception in paragraph (f)(3)(vii) provides that face coverings are not required when an employer can demonstrate that the use of a face covering prevents an employee from performing an essential part of their job (e.g., actors while performing, politicians while delivering speeches, performers while playing certain musical instruments). In such situations, any employee not wearing a face covering must remain at least 6 feet away from all other people unless the employer can demonstrate it is not feasible. Similar to the previous exception, the employee must resume wearing a face covering when not engaged in the activity where the face covering prevents the employee from performing an essential part of their job.

Under paragraph (f)(4) of the general section, when a face shield is required to comply with this paragraph or is otherwise required by the employer, the employer must ensure that face shields are cleaned at least daily and are not damaged. As defined in paragraph (b), *face shields* are devices, typically made of clear plastic, that (1) are certified to ANSI/ISEA Z87.1, incorporated by reference in 29 CFR 1910.509; or (2) cover the wearer's eyes, nose, and mouth to protect from splashes, sprays, and spatter of body fluids, wrap around the sides of the wearer's face (i.e., temple-to-temple), and extend below the wearer's chin. These specifications are critical design parameters for face shields to effectively contain respiratory droplets and prevent droplet transmission. Like face coverings, face shields can become soiled or dirty by splashes, sprays, or splatters, from contact with a contaminated surface, or by touching or adjusting it with contaminated hands. Damaged face shields may not fit properly, thereby reducing their

DRAFT

effectiveness. If damaged, face shields do not meet the required specifications. As required by paragraph (f)(4), employers will need to ensure face shields are cleaned at least once daily. Similar to face coverings, each time they are worn, face shields can become contaminated with bacteria and viruses, including the virus that causes COVID-19, which poses a risk of transmission to employees upon contact. As required by paragraph (k) of the general section, employers must ensure that each employee receives training on the employer's policies and procedures regarding how to properly care for, store, clean, maintain, and dispose of face shields. Also under paragraph (f)(4), when an employee provides a face shield that meets the definition in paragraph (b), the employer may allow the employee to use it and is not required to reimburse the employee for that face shield.

Paragraph (f)(5) of the general section allows employers to provide a respirator to the employee or permit the employee to wear their own respirator instead of a face covering as required by paragraph (f)(2). In such circumstances, the employer must comply with the mini respiratory protection program section of this ETS. *Respirators*, as defined in paragraph (b) of the general section, are a type of personal protective equipment that are certified by NIOSH or authorized under an Emergency Use Authorization (EUA) by the FDA, and protect against airborne hazards by removing specific air contaminants from the ambient (surrounding) air or by supplying breathable air from a safe source. Face coverings, facemasks, and face shields are not respirators. Respirator use can provide an additional level of comfort and protection for employees in circumstances that do not require a respirator to be used. The rationale for including the mini respiratory protection program section in the ETS is discussed in detail in *Need for Specific Provisions* (Section V of this preamble) and the requirements of the mini

DRAFT

respiratory protection program section are discussed in the *Summary and Explanation* for that section.

The final provision for face coverings (paragraph (f)(6) of the general section) provides that the employer must not prevent any employee from voluntarily wearing their own face covering, facemask, and/or face shield when they are not required by the ETS, unless the employer can demonstrate that doing so would create a hazard of serious injury or death, such as interfering with the safe operation of equipment. As an example, unless an employer establishes a hazard of serious injury or death, the employer must not prevent employees from wearing their own face shields over employer-provided face coverings, even though a face shield is not required by the general section. It is also noted in paragraph (f)(6) that this provision is not intended to prevent the employer from prohibiting certain face coverings, facemasks, or face shields with symbols, messages, or colors to maintain workplace dress code standards.

**Face Coverings Summary and Explanation References:**

Centers for Disease Control and Prevention (CDC). (2020, October 28). *How to Store and Wash Masks*. https://www.cdc.gov/coronavirus/2019-ncov/prevent-getting-sick/how-to-wash-cloth-face-coverings.html. (CDC, October 28, 2020)

*Cleaning and disinfection*

Hand washing removes germs from hands, while cleaning and disinfecting surfaces removes harmful contaminants from surfaces. Proper hand hygiene, combined with routine cleaning and situational disinfecting of surfaces, minimizes the risk of COVID-19 transmission through contact with contaminated surfaces. Therefore, the provisions under paragraph (g) of the general section and paragraph (j) of the healthcare section include cleaning and disinfection requirements for the workplace. Requirements include cleaning high-touch surfaces and equipment at least once a day, cleaning and disinfecting areas with suspected COVID-19

DRAFT

contamination, and providing employees with readily accessible hand washing facilities. The cleaning and disinfection requirements in this ETS are in addition to employers' obligations under OSHA's sanitation standards (29 CFR 1910.141, 29 CFR 1926.51, 29 CFR 1928.110). Because the sanitation standards address workplace hazards other than COVID-19, employers must continue to comply with their obligations under those standards.

The CDC recommends cleaning surfaces, using soap and water or detergent, to remove germs, dirt, and impurities (CDC, April 5, 2021). As defined in paragraph (b) of both the general and healthcare sections, *clean (or cleaning)* means the removal of dirt and impurities, including germs, from surfaces using soap and water or other cleaning agents. When no people with confirmed or suspected COVID-19 are known to have been in a space, cleaning once a day is usually sufficient to remove virus that may be on surfaces. To kill any additional germs on surfaces, disinfecting, in addition to cleaning, may be needed. As defined in paragraph (b) of the general section, *disinfect (or disinfection)* means using an EPA-registered disinfectant on EPA's "List N," in accordance with manufacturers' instructions to kill germs on surfaces. The definition in the healthcare section is the same except that the disinfectant must be hospital-grade. EPA's "List N", which is incorporated by reference in 29 CFR 1910.509, is a list of disinfectant products that can be used against the virus that causes COVID-19, including ready-to-use sprays, concentrates, and wipes (EPA, 2020). When used in accordance with manufacturers' instructions, EPA-registered disinfectants selected from List N are expected to kill the virus that causes COVID-19. Manufacturers' instructions include directions on the product's appropriate use site (e.g., home, business, healthcare, etc.), surface type (e.g., hard, non-porous surfaces like countertops; porous surfaces like fabrics), and contact time (i.e., the time the product needs to be visibly wet).

DRAFT

Under paragraph (j)(1) of the healthcare section, in patient care areas, resident rooms (e.g., in-patient long-term care residences, rehabilitation facilities, hospice facilities, other in-patient healthcare facilities), and for medical devices and equipment, an employer must follow standard practices for cleaning and disinfection of surfaces and equipment. These standard practices must be in accordance with "CDC's COVID-19 Infection Prevention and Control Recommendations" (CDC, February 10, 2021), and "CDC's Guidelines for Environmental Infection Control," pp. 86–103, 147-148, (CDC, July 2019), both incorporated by reference in 29 CFR 1910.509. Patient care areas do not include non-healthcare settings that emergency responders or other licensed health care providers enter to perform healthcare services (e.g., school nurse providing care to a student in a classroom). Emphasis for cleaning and disinfection should be placed on surfaces that are most likely to become contaminated with pathogens, including those in close proximity to the patient and frequently-touched surfaces in the patient-care environment (e.g., bed rails, bed frames, moveable lamps, tray tables, bedside tables, handles, IV poles, and blood-pressure cuffs). Additionally, in healthcare the disinfectant selected from List N must be hospital-grade.

Paragraph (g)(1) of the general section requires employers to clean high-touch surfaces and equipment at least once a day, following manufacturers' instructions for application of cleaners. Similarly, paragraph (j)(2)(i) of the healthcare section, for other than patient care areas, resident rooms, and medical devices and equipment, requires employers to clean high-touch surfaces and equipment at least once a day, following manufacturers' instructions for application of cleaners. Areas covered by paragraph (j)(2)(i) may include patient service counters, waiting rooms, breakrooms, and offices not used for patient care. Paragraph (b) of both sections defines *high-touch surfaces and equipment* to mean any surface or piece of equipment that is repeatedly

DRAFT

touched by more than one person. Examples may include doorknobs, light switches, countertops, handles, desks, tables, phones, keyboards, tools, toilets, faucets, sinks, credit card terminals, and touch-screen enabled devices (e.g., tablets).

Employers must evaluate the workplace to determine which surfaces and equipment need cleaning, and then ensure cleaning is performed at least once each work day. While for most situations, daily cleaning will be sufficient, as part of the hazard assessment required under paragraph (c)(4) in both the general and healthcare sections, employers may determine that some surfaces should be cleaned more than once a day. Examples of items that an employer might consider cleaning more than once per work day include any items that are shared, such as tools, tablets, and remote controls. For businesses where visitors or guests frequently touch the same surfaces and equipment as employees, such as retail stores or nail salons, an employer might also consider cleaning these surfaces and equipment more frequently.

Employers might also consider cleaning high-touch surfaces and equipment at fixed locations (e.g., work stations, breakrooms) at each shift change and when each employee rotates into the location. For example, when employees work at fixed locations, such as transaction counters (e.g., cash register, bank teller station, check-in counter, patient service counter), control rooms (e.g., manufacturing plant, air traffic control room), or shared stations or rooms used to provide personal services (e.g., salons, massage services), the employer may consider cleaning between employees (i.e., whenever a new employee rotates into the location). An employer may also consider cleaning high-touch surfaces and equipment in common spaces, such as bathrooms and breakrooms, at each shift change. Examples of high-touch surfaces and equipment in these spaces may include faucets, sinks, handles, and switches. For surfaces that are difficult to clean due to many interstices, such as keyboards and elevator buttons, the

DRAFT

employer could apply plastic wrap to those surfaces for easier cleaning (Chen et al., December 1, 2020).

Employers can satisfy their cleaning obligations through a variety of means (e.g., contracting a cleaning service, shared responsibility of employees). If the employer is relying on employees to clean, the employer must provide cleaning supplies at no cost to the employee, and consider providing individual cleaning supplies to each employee to prevent the need for employees to share those items. Employers must also ensure employees have sufficient time during their work shift to perform cleaning responsibilities, if applicable. To do this, an employer could establish a schedule that specifies the time each day when cleaning of high-touch surfaces will take place. In determining how much time to allocate for cleaning, the employer must ensure employees have enough time to follow the manufacturers' instructions for cleaners. To ensure employees have sufficient time to clean, businesses may conduct the cleaning when the facility is closed or temporarily pause operations, such as delaying customers from approaching a transaction counter, until it has been cleaned between employees.

OSHA notes that although paragraph (g)(1) of the general section requires employers to clean high touch surfaces and equipment at least once a day, the agency recognizes that there are some workplaces that are not regularly occupied (e.g., electrical vaults, occasional use trailers), but that are used by more than one employee, where daily cleaning would not be needed. In these cases, the employer should clean the work space before use by another employee.

When an employer is aware that a person who is COVID-19 positive has been in the workplace within the last 24 hours, paragraph (g)(2) of the general section (paragraph (j)(2)(ii) of the healthcare section) requires employers to clean and disinfect any areas, materials, and equipment under their control that have likely been contaminated by the person who is COVID-

DRAFT

19 positive (e.g., rooms they occupied, items they touched). In making determinations about which areas, materials, and equipment have likely been contaminated, OSHA expects employers will be informed by relevant CDC guidance, the specifics of any notice received about a COVID-19 positive person in the workplace (see paragraph (i)(3)(ii) of the general section and paragraph (l)(3)(i) of the healthcare section), such as when and where they were present, and relevant information on the COVID-19 logs (see paragraph (n)(2)(ii) of the general section and paragraph (q)(2)(ii) of the healthcare section). OSHA also notes that these determinations should be made without regard to whether the COVID-19 positive person was wearing a face covering.

Under this provision, cleaning and disinfecting must be done in accordance with "CDC's Cleaning and Disinfecting Guidance", which is incorporated by reference in 29 CFR 1910.509 (CDC, April 5, 2021). This includes closing off areas used by the sick person and waiting at least several hours before cleaning and disinfecting. While cleaning and disinfecting, this includes opening outside doors and windows or using other methods to increase air circulation when feasible, using products from EPA List N, and wearing a face covering and gloves. OSHA notes that if the employer learns about a COVID-19 positive person more than 24 hours after the person was in the area or used the materials or equipment, the employer does not need to close off any areas or wait any longer before cleaning in accordance with the rest of the CDC Guidance. When the CDC guidance recommends closing off spaces before cleaning and disinfecting, employers do not necessarily need to close all operations if they can close off just the affected areas. For example, in an office setting the employer may close the affected suite for at least several hours and then clean and disinfect the infected person's desk area and any other spaces that person may have occupied. In a retail setting, where the infected person was a cashier, an employer may be able to close just the contaminated register for at least several hours

DRAFT

and clean and disinfect all items within the cash register area (e.g., belt, keyboard, pens, light switch and buttons, bag holder, floor mat, partitions). If the cashier occupied other areas and/or used materials and items outside of the cash register area, those must also be cleaned and disinfected in accordance with this paragraph. An employer should always focus on cleaning and disinfecting frequently touched surfaces. However, if a person who is COVID-19 positive has occupied the space, all potentially contaminated surfaces, regardless of touch frequency, need to be cleaned and disinfected. Only after the space has been cleaned and disinfected can it be reopened for use (CDC, April 5, 2021).

Paragraph (g)(3) of the general section (paragraph (j)(3) of the healthcare section) requires employers to provide readily accessible hand washing facilities to be used by employees. Practicing hand hygiene, which includes hand washing with soap and water, is an effective way to prevent the spread of COVID-19. The CDC recommends employees frequently wash their hands with soap and water for at least 20 seconds, including whenever hands are visibly soiled, after removing any PPE, and after coughing, sneezing, or blowing one's nose (CDC, January 8, 2021). To promote frequent and thorough hand washing, paragraph (k)(1)(i) of the general section (paragraph (n)(1)(i) in the healthcare section) requires employers to train employees on the importance of hand washing and how to wash their hands effectively. Employers must make available enough facilities (e.g., hand washing stations), materials (e.g., soap, paper towels), and trash receptacles so employees can implement recommended hand washing practices. When determining the appropriate number and placement of hand washing facilities, employers must consider the physical distancing requirements in paragraph (d) of the general section (paragraph (h) of the healthcare section). Employers can consider placing hand hygiene stations near building doors to promote hand hygiene whenever employees enter the

DRAFT

worksite and near vending machines or where employees may eat (e.g., breakrooms, cafeterias) to ensure hand washing prior to eating. It is useful to place hand washing stations near locations where employees may have to handle contaminated goods or products (e.g., cash, customer returns) or where goods are exchanged (e.g., cash registers, drive thru windows). When an employee's job tasks require PPE, employers can also place hand washing stations near areas where PPE is put on or removed. Signs that encourage proper and frequent hand washing for employees can be placed near hand washing stations to promote good hygiene. The CDC has created handwashing materials that may be helpful for employers.

Where the employer can establish that readily accessible hand washing facilities cannot be provided, the employer must provide employees with alcohol-based hand rub with at least 60% ethanol or 70% isopropanol. In healthcare settings, the CDC recommends using an alcohol-based hand sanitizer with 60-95% alcohol (CDC, May 17, 2020). Use of alcohol-based hand sanitizer is an effective way to prevent the spread of COVID-19 when frequent hand washing is not feasible. Examples of when it may not be feasible for employers to provide readily accessible hand washing facilities may include settings where there is limited access to running water (e.g., certain remote worksites) or worksites where it is too cold to have running water in the winter. However, the absence of running water alone will not always mean it is infeasible for an employer to provide hand washing facilities. For example, the employer might be able to provide portable hand washing stations that do not rely on running water. Additionally, if an employer has employees who are in frequent, close contact with others, but have job duties that limit the frequency with which they can access hand washing facilities (e.g., employees at security guard stations or transaction counters), the employer must provide those employees with hand sanitizer in accordance with the standard.

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**Cleaning and Disinfection Summary and Explanation References:**

Centers for Disease Control and Prevention (CDC). (2019, July). Guidelines for Environmental Infection Control in Health-Care Facilities: Recommendations of CDC and the Healthcare Infection Control Practices Advisory Committee (HICPAC). https://www.cdc.gov/infectioncontrol/guidelines/environmental/index.html (CDC, July 2019)

Centers for Disease Control and Prevention (CDC). (2020, May 17). *Hand Hygiene Recommendations: Guidance for Healthcare Providers about Hand Hygiene and COVID-19.* https://www.cdc.gov/coronavirus/2019-ncov/hcp/hand-hygiene.html#:~:text=Background,and%20infections%20in%20healthcare%20settings (CDC, May 17, 2020)

Centers for Disease Control and Prevention (CDC). (2021, April 5). *Cleaning and Disinfecting Your Facility: Every Day and When Someone is Sick.* https://www.cdc.gov/coronavirus/2019-ncov/community/disinfecting-building-facility.html (CDC, April 5, 2021)

Centers for Disease Control and Prevention (CDC). (2021, January 8). *Handwashing.* https://www.cdc.gov/coronavirus/2019-ncov/global-covid-19/handwashing.html (CDC, January 8, 2021)

Centers for Disease Control and Prevention (CDC). (2021, February 10). *Interim Infection Prevention and Control Recommendations for Healthcare Personnel During the Coronavirus Disease 2019 (COVID-19) Pandemic.* https://www.cdc.gov/coronavirus/2019-ncov/hcp/infection-control-recommendations.html (CDC, February 10, 2021)

Chen, Y., Pradhan, S., Xue, S. (2020). *Novel role of plastic wrap in COVID-19*. JAAD International, 1(2), 77-78. https://doi.org/10.1016/j.jdin.2020.06.001 (Chen et al., December 1, 2020)

Environmental Protection Agency. (2020). *List N Tool: COVID-19 Disinfectants.* https://cfpub.epa.gov/giwiz/disinfectants/index.cfm (EPA, 2020)

*Ventilation*

Improving ventilation is a critical component of an effective multi-layered approach to controlling the spread of COVID-19 and is required for compliance with the COVID-19 ETS. Accordingly, paragraph (h) of the general section (paragraph (k) of the healthcare section) requires that employers who own or control buildings or structures with an existing heating, ventilation, and air conditioning (HVAC) system(s) ensure adequate ventilation in accordance

DRAFT

with the specific provisions of the paragraph.[26] This requires employers to verify that the system is functioning as designed.

All of the provisions in paragraph (h) (paragraph (k) of the healthcare section) align with guidance from both the CDC and the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) (ASHRAE, 2020a; ASHRAE, 2020b; CDC, February 9, 2021). The provisions in paragraphs (h) of the general section and (k) of the healthcare section aim to improve ventilation by diluting and filtering the concentration of potentially infectious particles in the air present in the workplace with fresh, outside air to reduce exposure risk. Additional explanation of the function and effectiveness of ventilation as a COVID-19 control is provided in *Need for Specific Provisions* (Section V of this preamble).

As part of the ventilation provision, employers are required to ensure the HVAC system(s) is used in accordance with the HVAC manufacturer's instructions and the design-specifications of the HVAC system(s), as outlined in paragraph (h)(1) of the general section (paragraph (k)(1)(i) in the healthcare section). Because each building or structure and its existing HVAC system(s) will be different, employers and building owners/operators may find it necessary to consult with an HVAC professional to ensure that HVAC systems are working as designed to provide adequate ventilation according to these provisions. HVAC professionals can determine the best way to maximize the system's ventilation and air filtration capabilities for each specific room in the building and thereby ensure the system is operating according to the HVAC system(s) design specifications. Whenever implementing ventilation improvements,

[26] There may be situations where workplaces have HVAC systems but employers are not in control of the system, such as at malls, office buildings, or healthcare offices or clinics located within larger commercial buildings. In these situations, employers should coordinate with the building owner or operator to ensure that the requirements of paragraph (h) of the general section (paragraph (k) of the healthcare section,) are met. Additionally, the provisions in the general and healthcare sections do not require the installation of new HVAC systems to replace or augment functioning systems.

DRAFT

employers and building owners should maintain other indoor environmental quality parameters, such as moisture, temperature, humidity, and air quality that may be altered when opening the building's outdoor air intake dampers. Additional guidance on implementing these ventilation changes can be found in the *Technological Feasibility* (Section VI of this preamble).

Paragraph (h)(2) of the general section (paragraph (k)(1)(ii) in the healthcare section) requires that employers ensure the amount of outside air supplied to the HVAC system(s) is maximized to the extent appropriate and compatible with the HVAC system's capabilities. Employers should work with building owners/operators to increase the amount of outdoor air provided in the existing HVAC system(s), if possible and if aligned with the capacity of the system. Maximizing the amount of outdoor air being circulated through the HVAC system(s) to the extent appropriate increases the amount of fresh air available indoors, which decreases the concentration of potentially infectious particles present in the air of that space. When maximizing outside air circulation, employers and building owners should use caution in areas where outdoor environmental contaminants (e.g., extreme heat or cold, humidity, carbon monoxide, molds, pollen) may pose health risks Information on maximizing outdoor air is discussed in more detail in *Technological Feasibility* (Section VI of this preamble).

The healthcare equivalent in paragraph (k)(1)(ii) is slightly different. Under paragraph (k)(1)(ii) of the healthcare section, employers shall maximize, to the extent appropriate, the "number of air changes per hour" (ACHs). ACHs are a measure of the air volume that is added or removed from a space in one hour per the volume of the space, or how frequently the air within that space is replaced per hour. Maximizing ACHs will help dilute the overall potential concentration of COVID-19 particles in the work environment. Unlike in general industry, ACHs are already commonly considered as a part of the environment of care within healthcare facilities

DRAFT

(CDC, 2003), and as such, employers in healthcare and associated industries may already be in compliance with this provision. As with other elements of this provision, a ventilation expert or technician can assist a building owner/operator or employer maximize ACHs based on the workspace and the design capabilities of the HVAC system(s). HVAC systems must always be maintained and operated in accordance with design and manufacturers' recommendations.

Air filters in HVAC systems remove particles, including aerosolized particles that may contain COVID-19, from recirculated air streams before returning the air to workspaces. Air filters are available in many varieties and are made of different materials such as pleated paper, cloth, woven fiberglass, and polyester. A filter's efficiency is measured by the fraction of particles it is able to remove from the air stream. Increased filter efficiency reduces the risk of COVID-19 transmission. There are several systems for rating filter efficiencies. The most common is the Minimum Efficiency Reporting Value (MERV) rating system developed by ASHRAE. Some air filters use alternative rating systems and do not provide a MERV rating on their packaging. In such cases, employers or building operators can determine the filter's MERV rating by contacting the manufacturer or reviewing the product description on their web page.

Paragraph (h)(3) of the general section (paragraph (k)(1)(iii) of the healthcare section) requires air filters be rated as MERV-13 or higher, if compatible with the ventilation system, which aligns with ASHRAE (ASHRAE, 2020a; ASHRAE, 2020b). OSHA selected the MERV-13 filter as the minimum filter requirement (assuming compatibility with the system) to follow the recommendation of ASHRAE. Where a MERV-13 or higher filter is not compatible with the HVAC system, employers must use the filter with the highest compatible filtering efficiency for the HVAC system. The CDC recommends upgrading filtration to be as high as possible without significantly reducing design airflow (CDC, February 9, 2021). OSHA agrees with the CDC

DRAFT

recommendation that employers should use the highest filtration system compatible with their HVAC system when possible, but because this is a mandatory standard OSHA has specified a minimum filtration level, MERV-13, in order to provide clearer guidance to employers (the CDC recommendation is non-mandatory guidance).

Filters with MERV ratings of 13 or greater are at least 85% efficient at capturing particles similar in size to those carrying the virus that causes COVID-19. Higher rated filters, such as MERV-14 or greater, capture particles more efficiently, but they also can slow down the air flow. Increasing fan speed can help improve air flow to counterbalance the impact of more efficient filters, but it is not always possible to do so without stressing the HVAC system beyond its capabilities, or without significant increases in energy use.

For that reason, HVAC systems are typically designed for specific filter efficiencies and it is important to use a filter with a MERV value as high as the system can handle (more efficient filtration), but not higher. Many existing HVAC systems are designed and installed to operate with filters ranging from MERV-6 to MERV-8. Before upgrading to a higher-level filter, employers should evaluate their existing HVAC system(s) to determine if it will be able to operate properly with a MERV-13 or higher filter. In those situations where MERV-13 or higher filters are not compatible with the existing ventilation system, employers must use filters with the highest compatible filtering efficiency for their HVAC system(s) to maintain compliance with paragraph (h)(3) of the general section (paragraph (k)(1)(iii) of the healthcare section). Employers should consult an HVAC technician or specialist before upgrading filter efficiencies in HVAC systems if needed.

Dirty filters can decrease airflow and negatively affect HVAC system performance. Paragraph (h)(4) (paragraph (k)(1)(iv) of the healthcare section) requires employers to maintain

DRAFT

air filters and replace them as necessary to ensure the proper function and performance of the HVAC system(s). Air filters must be maintained and replaced in accordance with design and manufacturers' recommendations. This would include, for example, the establishment of a planned replacement schedule that identifies the frequency under which filters should be replaced. Additionally, it is recommended that a supply of replacement filters are kept on hand to ensure timely replacement. When replacing filters, employers should follow manufacturers' recommendations for appropriate PPE and provide PPE in accordance with other OSHA standards.

Paragraph (h)(5) of the general section (paragraph (k)(1)(v) of the healthcare section) requires that employers ensure all intake ports that provide outside air to the HVAC system are cleaned, maintained, and cleared of any debris that may affect the function and performance of the HVAC system. This would include, for example, the establishment of a planned maintenance schedule that identifies the frequency with which the removal of dust and debris from ductwork, vents, and intake ports must occur. This should be completed as frequently as necessary to ensure the function and performance of the HVAC system is maintained, which can be determined with the assistance of an HVAC technician or the building operator. Outdoor air intakes must be inspected regularly to ensure they are not blocked or obstructed, and dampers must be evaluated to ensure their proper functionality, which is in accordance with ASHRAE recommendations (ASHRAE, 2020a). Employers may consider assessing indoor supply air diffusers and return air grilles to ensure they are not blocked or obstructed, are working properly, and their surfaces are clean.

Employers should demonstrate a good faith effort in achieving the requirements outlined in paragraph (h) (paragraph (k) of the healthcare section) in the allotted time. This would include

DRAFT

evaluating the existing HVAC system, having conversations with building owners and operations, attempting to schedule appointments with HVAC technicians, and implementing changes to improve ventilation as much as feasible in their workplace. Additional information on the timing of implementation of ventilation requirements can be found in the summary and explanation of *Dates*.

**Ventilation requirements specific to healthcare**

There are additional ventilation provisions for the healthcare section. In addition to the slight distinction in paragraph (k)(1)(ii), addressed earlier, paragraph (k)(2) of the healthcare section requires healthcare employers to maintain and operate existing airborne infection isolation rooms (AIIR) in accordance with their original design and construction criteria, where AIIRs are used. *AIIRs* are defined as dedicated negative pressure patient-care rooms, with special air handling capability, which are used to isolate persons with a suspected or confirmed airborne-transmissible infectious disease. AIIRs include both permanent rooms and temporary structures (e.g., a booth, tent or other enclosure designed to operate under negative pressure) (paragraph (b) of the healthcare section). AIIRs are designed to keep contaminated air from escaping that area, and are required in healthcare settings when performing aerosol-generating procedures on someone with suspected or confirmed COVID-19, subject to feasibility. AIIRs lower the risk of cross-contamination between patient rooms and reduce the risk of transmission of COVID-19 between patients and employees (NIH, October 9, 2020). According to the CDC, AIIRs are rooms kept at negative pressure relative to the surrounding areas with a minimum of 6 ACHs, and 12 ACHs are recommended for newly constructed or recently renovated spaces (CDC, February 10, 2021). The doors on AIIRs should be kept closed except during entry or exit, and air from within AIIRs should be exhausted directly to the outside of the building or should be

DRAFT

filtered through high-efficiency particulate air (HEPA) filters before it is recirculated (CDC, February 10, 2021). Employers must ensure that the proper negative-pressure function of AIIRs is maintained. Again, employers and building owners/operators should consult with a ventilation professional to ensure that AIIRs are operating as designed. As described in note 1 to paragraph (k) of the healthcare section, this section does not require the installation of new AIIRs to replace or augment functioning systems in healthcare and associated industries.

**Other Methods for Increased Ventilation**

As note 2 to paragraph (h) of the general section (paragraph (k) of the healthcare section) states, all employers should also consider other measures to improve ventilation in accordance with guidance from the CDC (CDC, February 9, 2021). While not required under this standard, there are a variety of controls employers should consider to maximizing ventilation and filtration buildings and structures without HVAC systems or in addition to existing HVAC systems. OSHA is recommending these, rather than requiring them, because there are too many variables regarding when they are appropriate to make requirements simple and clear in the regulatory text or to provide clear guidance as to when employers would and would not be in compliance. This could include increasing airflow to occupied spaces, if possible. One way to achieve this is by opening windows and doors, where feasible. This could include the opening of retractable walls, such as those found in some restaurant settings, overhead doors, which may be found in industrial, manufacturing, or repair and maintenance services industries, or the opening of doors not typically used for entry or exit. These measures that work to increase the amount of fresh air available could be used during work hours, but also before and after occupancy to flush the workspace. Employers should avoid opening windows and doors if doing so would pose health or safety risks to employees or other occupants, such as the risk of falling or exposure to outdoor

DRAFT

environmental contaminants (e.g., extreme heat or cold, humidity, carbon monoxide, air pollution, molds, pollen). Screen doors or windows may help alleviate some of the potential hazards.

In some industries, it may be difficult to optimize ventilation in the absence of an existing HVAC system. For example, increasing ventilation in buildings or structures at a construction site may be difficult because there may not be an existing HVAC system for enclosed areas, and opening windows and doors may not be feasible at all times due to poor weather conditions that impair work quality, equipment functionality, and employee health and safety. In these situations, employers could consider working in open areas to the extent feasible and using open-sided tents or tarping overhead to provide shelter from the elements while still allowing natural ventilation. As construction progresses and HVAC systems are brought into commission, employers must immediately use them when feasible and optimize the system(s) based on the ventilation requirements outlined in these provisions. In these situations, lower grade filters may be used as pre-filters on air returns to protect the integrity of the HVAC system(s) for the building owner. Additionally, portable air cleaners both described further below, may help in optimizing ventilation.

Portable fans could be used to increase the effectiveness of opening windows and doors. However, if using portable fans, they should be positioned to avoid blowing air from the breathing zone of one person towards other people. One example of an effective use of portable fans would be to use a window fan, placed securely in a window to exhaust room air to the outdoors while drawing fresh air into the room via other open windows (CDC, February 9, 2021). If ceiling fans are being used, the flow direction should be reversed to blow upward

DRAFT

(ASHRAE, 2020a). Additional ventilation measures are also discussed in more detail in *Technological Feasibility* (Section VI of this preamble).

Under note 2 of paragraph (h) of the general section (paragraph (k) of the healthcare section) employers should also consider ways to maximize ventilation in vehicles when feasible. To do so, the driver can open the windows, as weather permits. Similar to in buildings, avoid opening windows and doors if doing so would pose health or safety risks to employees or other occupants, such as the risk of falling or exposure to outdoor environmental contaminants (e.g., extreme heat or cold, humidity, carbon monoxide, air pollution, molds, pollen). Additionally, the air ventilation or air conditioning should be set to non-recirculation mode to prevent the same, potentially contaminated, air from recirculating throughout the vehicle (CDC, February 17, 2021).

In the absence of an existing HVAC system, it is recommended to reduce the number of people allowed within the workspace or housing environment. This may include reducing the number of employees in the work environment or limiting the number of patrons or guests allowed to enter the workplace at a time. Reducing the number of people in an indoor shared space can reduce the concentration of potentially contaminated air in the shared space. In these situations, employers should comply with state and local guidelines for maximum occupancy, and with other controls required by this standard, such as face coverings, cleaning shared equipment, and physical distancing.

It is also recommended that all local exhaust fans (e.g., restrooms, kitchen or cooking areas) are functional and operating at full capacity when the building or structure is occupied (ASHRAE, 2020a; ASHRAE, 2020b; CDC, February 9, 2021).

DRAFT

Employers may consider using portable air cleaners fitted with high efficiency particulate air (HEPA) filters, especially in high occupancy areas or spaces with poor ventilation (ASHRAE, 2020a). Portable air cleaners pull surrounding air in, filter it, and recirculate cleaner air back into the room. If using portable air cleaners, employers should consider the size of the room or space where the unit will be used. Most manufacturers specify the size of the space for which their units are designed. The Clean Air Delivery Rate (CADR) is a measure of the effectiveness and capacity of the portable air cleaner. The higher the CADR, the more particles the air cleaner can filter and the larger the area it can serve. Units equipped with high-efficiency particulate air (HEPA) filters typically achieve a higher CADR and can remove at least 99.97% of dust, pollen, mold, viral particles, and any airborne particles with a size of 0.3 microns (µm) or greater, including particles containing the virus that causes COVID-19. Portable air cleaners would be most effective if placed as close to potential sources of COVID-19 as possible to increase effective capture of the infectious particles. Additionally, portable air cleaners should be placed to avoid blocking airflow, and as such they should not be placed behind furniture or curtains. If portable air cleaners are being used, employers should avoid creating directional airflow across employees by drawing contaminated air past breathing zones of employees. Avoid the use of fans around or above portable air cleaners which can create currents that direct air away from the filters and thereby reduce the efficiency of the air cleaner.

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**Ventilation Summary and Explanation References:**

American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE). 2020a. Commercial. https://www.ashrae.org/technical-resources/commercial (ASHRAE, 2020a)

American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE). 2020b. Filtration / Disinfection. https://www.ashrae.org/technical-resources/filtration-disinfection (ASHRAE, 2020b)

Centers for Disease Control and Prevention (CDC). (2003). *Background C. Air: Guidelines for Environmental Infection Control in Health-Care Facilities.* https://www.cdc.gov/infectioncontrol/guidelines/environmental/background/air.html (CDC, 2003)

Centers for Disease Control and Prevention (CDC). (2021, February 9). *Ventilation in Buildings*. https://www.cdc.gov/coronavirus/2019-ncov/community/ventilation.html (CDC, February 9, 2021)

Centers for Disease Control and Prevention (CDC). (2021, February 10). *Interim Infection Prevention and Control Recommendations for Healthcare Personnel During the Coronavirus Disease 2019 (COVID-19) Pandemic*. https://www.cdc.gov/coronavirus/2019-ncov/hcp/infection-control-recommendations.html (CDC, February 10, 2021)

Centers for Disease Control and Prevention (CDC). (2021, February 17). *Protect Yourself when Using Transportation*. https://www.cdc.gov/coronavirus/2019-ncov/daily-life-coping/using-transportation.html (CDC, February 17, 2021)

National Institutes of Health (NIH). (2020, October 9). *Infection Control*. https://www.covid19treatmentguidelines.nih.gov/critical-care/infection-control/ (NIH, October 9, 2020)

*Health screening and medical management*

To reduce the risk of transmitting the virus that causes COVID-19 and possible infection to employees and others in the workplace, it is essential to screen employees for illness, prevent infectious employees from entering the workplace, and notify any employees who may have been exposed to an individual with COVID-19. It is also critical to ensure that employees are not disincentivized by fear of lost pay from notifying their employer of COVID-19-related concerns that will require their removal from the workplace. An employee with COVID-19 who does not report their condition to their employer for fear of losing essential income endangers everyone else at the workplace. The provisions under paragraph (i) of the general section (paragraph (l) of the healthcare section) allow for early intervention to identify and remove from the workplace employees who have or are likely to have COVID-19, and to ensure that the employees receive sufficient protections to encourage honest communication with their employers. Screening

DRAFT

employees for COVID-19 and removing them from the workplace when they are infected or likely to be infected is critical for an effective workplace infection prevention program and required for compliance with these sections.

Screening

Paragraph (i)(1) of the general section and paragraph (l)(1) of the healthcare section discuss the requirements employers have for screening employees for COVID-19 symptoms. As defined in paragraph (b), *COVID-19 symptoms* may include fever or chills; cough; shortness of breath or difficulty breathing; fatigue; muscle or body aches; headache; new loss of taste or smell; sore throat; congestion or runny nose; nausea or vomiting; or diarrhea. The CDC has recognized each of these symptoms as potentially indicative of COVID-19 (CDC, February 22, 2021). As further discussed in *Grave Danger* (Section IV of this preamble), symptomatic cases of COVID-19 can cause a range of illness, from very mild cases to severe or critical cases requiring hospitalization. Paragraph (i)(1)(i) of the general section (paragraph (l)(1)(i) of the healthcare section) requires the employer to screen each employee for COVID-19 symptoms before each work day and each shift. Under this provision, screening may be conducted by asking employees to self-monitor before reporting to work or may be done through in-person methods conducted by the employer. To ensure this screening requirement is properly implemented, employers are required to educate and train all employees on the signs and symptoms of COVID-19, and on the employer's policies and procedures for reporting illness, as specified under paragraphs (k)(1)(i) and (k)(1)(viii) of the general section (paragraphs (n)(1)(i) and (n)(1)(ix) of the healthcare section).

Employers who choose to have employees self-monitor for COVID-19 symptoms can assist employees in that effort by providing them with a short fact sheet to remind them of the

DRAFT

symptoms of concern. Employers may also consider posting a sign stating that any employee entering the workplace certifies that they do not have symptoms of COVID-19, to reinforce the obligation to self-screen before entering the workplace.

Employers who choose to conduct in-person employee screening for COVID-19 symptoms may use methods such as temperature checks and asking the employee if they are experiencing symptoms consistent with COVID-19. Employers should conduct this screening before employees come into contact with others in the workplace, such as co-workers, customers, patients, or visitors. When implementing in-person screening, there are additional considerations and responsibilities under this ETS as well as other potentially applicable laws. Many individuals assisting with in-person screening at the worksite may not be medical professionals, thus it is important that the employer ensure that those individuals have any training that is required as specified under paragraph (k)(1) of the general section (paragraph (n)(1) of the healthcare section). This training must include knowledge about the signs and symptoms of COVID-19, the employer's policies and procedures for health screening, as well as job tasks they would have to complete while conducting health screening, such as the proper use of no-touch thermometers.

When doing in-person screening, employers must protect employee privacy and ensure that findings are kept confidential as required under the Americans with Disabilities Act (EEOC, December 16, 2020). To maintain privacy, employers may ask employees about symptoms in an area where others cannot hear the responses (e.g., private room). To ensure screeners and employees waiting to be screened are protected, an employer must continue to maintain compliance with all requirements of this standard for physical distancing, physical barriers, and face covering use; thus, employers may need to provide physical barriers to separate employees

DRAFT

and screeners and ensure that employees waiting to be screened can maintain adequate physical distancing between each other (see paragraphs (d), (e), and (f) of the general section or paragraphs (f), (h), and (i) of the healthcare section). Employers might also consider using automated temperature monitoring systems that passively measure employees' temperatures if there are sufficient assurances that the system in use can accurately measure temperatures, as these systems would limit an employee from having to conduct temperature screenings in close contact with another person.

Employers have discretion in choosing whether to implement self-monitoring or in-person screening; an employer can also choose to utilize both methods. Both options have advantages and disadvantages that may make them better suited for different types of work environments. In-person screening allows the screener to remind the employee about COVID-19 symptoms instead of relying on the employee to recall the symptoms of concern. Additionally, in-person screening may be easier for small business employers (e.g., small restaurants, stores, or machine shops). For small businesses, it would likely be efficient for the employer to do a temperature check and ask employees if they are experiencing certain symptoms in a private area. In-person screening may present more challenges to larger employers (e.g., corporately owned manufacturing, food processing, or warehouse facilities), where many employees may be arriving to work within the same time frame. In those cases, if employers choose to conduct in-person screenings, the employer should ensure screenings are conducted in a timely manner to minimize potential exposure to other employees waiting to be screened and to the screener.

Having employees self-monitor for COVID-19 symptoms before reporting to work also has some advantages that employers may find beneficial, such as protecting the employee's privacy, eliminating the risk of potentially exposing others when commuting to the workplace

DRAFT

(e.g., passengers on public transportation), and avoiding close contact between potentially infected employees and others when conducting in-person screenings (e.g., a person taking temperatures, other employees while waiting in line).

If the screening process reveals that an employee is experiencing COVID-19 symptoms, the employer should determine whether the symptoms require the employee's immediate removal from the workplace, discussed in further detail below. The employer needs to be aware that screening will not identify all employees who have COVID-19. Some individuals with COVID-19 may be pre-symptomatic (i.e., have not developed symptoms yet) or asymptomatic (i.e., do not develop symptoms over the course of infection) but can still transmit the virus. Therefore employers must continue to follow all requirements of the standard, using health screening as only one component of a multi-layered approach.

Paragraph (i)(1)(ii) of the general section (paragraph (l)(1)(ii) of the healthcare section) specifies that if the employer requires a COVID-19 test for screening purposes, the employer must provide the test to each employee at no cost to the employee. As defined in paragraph (b) of both sections, a *COVID-19 test* means a test for SARS-CoV-2 that is both: (1) cleared or approved by the U.S. Food and Drug Administration (FDA) or is covered by an Emergency Use Authorization (EUA) or Notification from the FDA to diagnose current infection with the SARS-CoV-2 virus; and (2) administered in accordance with the FDA clearance or approval or the FDA EUA as applicable. Although it is not required under this ETS, OSHA understands that some employers might choose to require employees to be tested for COVID-19 before entering the workplace. Relatedly, employers may require employees to undergo COVID-19 testing for other work-related reasons, such as required screening before or after travel to another state to perform work duties. For further information on legal aspects of requiring testing, employers can consult

DRAFT

guidance from EEOC (December 16, 2020). If the employer chooses to require testing, it must ensure it is using a COVID-19 test that satisfies the definition in this standard, and the employer must pay the employee for all costs associated with the test. This includes, for example, costs of the test itself, as well as any time spent getting the test or time spent waiting for test results before the employee is allowed to enter the workplace. If getting the test requires the employee to travel to a location that is not at the workplace, the employer must pay the employee for the time spent traveling and for any travel costs (e.g., transportation fare, gasoline). For more information about the employer's obligation to implement the requirements of this standard at no cost to employees, see the summary and explanation discussion of *No Cost to Employees* of the general section below. Employers should be aware that testing will not detect every employee who has COVID-19. For example, false negative results could occur if the employee is infected but is tested at a point in time where the levels of virus being shed are below the detection limit of the test being performed. For that reason, employers conducting testing must continue to follow all requirements of this standard.

DRAFT

Employee notification to employer of COVID-19 illness or symptoms

Paragraph (i)(2) of the general section and paragraph (l)(2) of the healthcare section pertain to employee notification of COVID-19 illness or symptoms. Under this paragraph, the employer must require each employee to promptly notify the employer of four different circumstances. First, each employee must be required to promptly notify their employer when the employee learns they are COVID-19 positive (i.e., confirmed positive test for, or has been diagnosed by a licensed healthcare provider with, COVID-19) (paragraph (i)(2)(i) of the general section, paragraph (l)(2)(i) of the healthcare section). Thus, employers must require employees to report their illness if they are COVID-19 positive as confirmed by either a positive test or a

licensed healthcare provider's diagnosis. Second, employers must ensure that each employee promptly notifies their employer if the employee has been told by a licensed healthcare provider that they are suspected to have COVID-19 (paragraph (i)(2)(ii) of the general section, paragraph (l)(2)(ii) of the healthcare section). Third, employers must ensure that each employee promptly notifies their employer if the employee is experiencing recent loss of taste and/or smell with no other explanation (paragraph (i)(2)(iii) of the general section, paragraph (l)(2)(iii) of the healthcare section). If the employee reports having a recent loss of taste and/or smell, the employer should inquire as to whether there is any other explanation for the symptom apart from COVID-19, but the employer is not required to ask nor is the employee required to share any specific information about an alternative condition that may explain the symptom. (Alternative causes for recent loss of taste and/or smell could include, e.g., a non-COVID-19 respiratory infection, sinus infection, or non-infectious neurological disorder, such as Parkinson's disease.) Finally, under paragraph (i)(2)(iv) of the general section (paragraph (l)(2)(iv) of the healthcare section), employers must ensure each employee promptly notifies their employer if the employee is experiencing both a fever (≥100.4° F) and new unexplained cough associated with shortness of breath. Again, if the employee reports having these symptoms, the employer should inquire as to whether there is any other explanation for the fever (e.g., an infection that is not related to COVID-19) or cough associated with shortness of breath apart from COVID-19 (e.g., a non-COVID-19 respiratory illness; a non-infectious condition such as chronic obstructive pulmonary disease). And again, the employer is not required to ask nor is the employee required to share any specific information about the alternative explanation for the symptoms. To distinguish from situations where shortness of breath is expected (e.g., while conducting strenuous exercise or tasks), the employer could frame the question in terms of whether the employee is experiencing

DRAFT

shortness of breath while at rest or in a way that makes it more difficult to perform their job tasks or everyday activities. The COVID-19 symptoms included in these latter two notification categories should be included in the employer's required daily screening so that employees are particularly cognizant of monitoring for those symptoms in order to report them to their employer.

As noted, each of these notifications is required to be made to the employer "promptly." For employees who are not at the workplace when they meet a notification criteria, "promptly" notifying the employer would mean notifying the employer before the employee is scheduled to start their shift or return to work. In the event that the employee is in the workplace when meeting a notification criteria (e.g., the employee starts experiencing a reportable symptom of COVID-19), "promptly" notifying the employer means notifying the employer as soon as safely possible. For example if a nurse caring for patients starts to develop an unexplained loss of taste while at work, the nurse should immediately notify their employer of their COVID-19 symptom while avoiding exposing any other employees or non-employees. In both healthcare and non-healthcare settings, the procedures for these notification requirements can be based on current protocols that are in place for employees to notify the employer if they are not able to come to work or need to leave work because of illness or injury. The employer must train all employees on the employer's policies and procedures for notifying the employer of illness and symptoms, as specified under paragraph (k)(1)(viii) of the general section and paragraph (n)(1)(ix) of the healthcare section. This should include training employees on who to contact and how to contact that person. For example, employees can be informed to contact individuals such as the company owner, their direct supervisor, or the COVID-19 safety coordinator(s) under paragraph (c)(3) of both the general and healthcare sections. Employees must be given this person's contact

DRAFT

information, such as their email, company phone number, or cell phone number. If an employer takes all steps required under this paragraph but an employee fails to report required information, the ETS does not dictate that any disciplinary action be taken against the employee. If an employer is cited by OSHA under this provision under such circumstances, the employer is entitled to contest the citation if it can establish an employee misconduct defense in accordance with applicable case law.

Each of these notification requirements are important measures to ensure employers can take adequate steps to protect their employees from the hazard of COVID-19 because each notification requirement is connected to a parallel requirement in (i)(4) and (l)(4) to remove the employee at issue from the workplace. As described in *Need for Specific Provisions* (Section V of the preamble), it is important to remove employees who are confirmed or suspected to have COVID-19 from the workplace to prevent the transmission of the virus that causes COVID-19 to other employees. However, because COVID-19 symptoms are non-specific and common with other infectious and non-infectious conditions, OSHA has determined that it is not economically feasible to remove all workers experiencing any potential symptom of COVID-19. Thus, OSHA has limited required notification—and subsequent removal—to the symptoms discussed above in paragraphs (i)(2)(iii)-(iv) of the general section (paragraphs (l)(2)(iii)-(iv) of the healthcare section). As discussed in further detail below, the decision to require notification of these particular symptoms is based on a strategy that protects the safety of other employees in the workplace by identifying criteria most likely to capture COVID-19 employees within the constraints of feasibility. This does not, however, prevent employers from using a broader range of symptoms to exclude additional employees, as long as it ensures those employees also do not

DRAFT

suffer any adverse action as a result of that removal as consistent with paragraph (i)(5)(v) of the general section (and (l)(5)(v) of the healthcare section), discussed below.

OSHA considered several symptom lists to trigger notification and removal of employees, each discussed in greater detail in the *Need for Specific Provisions* section of this preamble (Section V). First, OSHA considered basing notification and removal on the CDC list of symptoms. However, that list is extremely broad and includes many common symptoms that are not specific to COVID-19, such as fever or chills, cough, fatigue, muscle or body aches, headache, congestion or runny nose, nausea or vomiting, and diarrhea. Use of these symptoms could require removal of large swaths of the workforce, many of whom may not have COVID 19, and payment of accompanying medical removal protection benefits. This would pose economic feasibility concerns (see *Economic Feasibility*, Section VI.B), and it could leave employers, especially small employers, without an adequate workforce to continue operations in many cases. OSHA next considered basing notification and removal on the Council of State and Territorial Epidemiologists (CSTE) surveillance definition for COVID-19. However, while that list is narrower than the CDC list, it still contains many common, non-specific symptoms and thus presents the same concerns. For example, the CSTE list would require removal of any employee experiencing just a cough, which OSHA expects would result in removal of many employees who do not have COVID-19. And although the CSTE definition also includes consideration for more than one symptom (e.g., fever in addition to sore throat), many of the symptoms that can be combined are also non-specific and could potentially lead to removal of many employees who do not have COVID-19.

Accordingly, OSHA found it necessary to develop its own list of symptoms requiring notification and removal from the workplace, based on the evidence discussed in *Need for*

DRAFT

*Specific Provisions* (Section V of the preamble), that adequately identifies infection hazards within the realities of economic feasibility. As noted above, these symptoms include: recent loss of taste and/or smell with no other explanation; or fever (≥100.4° F) and new unexplained cough associated with shortness of breath. OSHA has determined that recent loss of taste and/or smell, without another explanation, is a symptom that is highly specific for COVID-19 and the least likely symptom to result in removing an employee from the workplace who does not have COVID-19. The other symptoms—fever, cough, and shortness of breath—are three of the symptoms that are most common to COVID-19, but fever and cough are non-specific for COVID-19; accordingly, requiring removal of any employee who has just fever or cough could result in the removal of many employees who do not have COVID-19. However, a combination of fever, cough, and shortness of breath is likely to result in higher specificity that avoids excluding employees who do not have COVID-19. Therefore, requiring removal where an employee is experiencing all three of these common COVID-19 symptoms will ultimately lead to removal of employees who are likely to have COVID-19, while not compromising an employer's ability to continue operations by removing employees who do not have COVID-19. As discussed further in Section VI.B, *Economic Feasibility*, OSHA has found removal in these circumstances feasible.

OSHA's determination that employees must notify their employer, and be removed from the workplace when they are experiencing the above symptoms is based on the best evidence currently available to the agency. However, OSHA recognizes that it is operating at the frontiers of science and it will, accordingly, continue to monitor the science, and will make appropriate modifications to the ETS or adjustments in enforcement policy as warranted by the evidence.

DRAFT

Moreover, nothing in this ETS precludes an employer from requiring employees to notify the employer of additional symptoms of COVID-19 not specified by this paragraph.

It is crucial that employees promptly inform their employer of these circumstances because this information allows the employer to take actions to protect other employees, including most critically by removing employees who pose a direct threat of infection to other employees in the workplace. The information conveyed by these notifications also allows the employer to take other important steps to protect its employees, including cleaning and disinfecting areas that may have been contaminated (as required under paragraph (g)(2)(iii) of the general section). In addition, the employer can start the required notifications to other employees who may have been exposed to a COVID-19-positive employee, as described in further detail below.

DRAFT

Employer notification to employees of COVID-19 exposure in the workplace

Paragraph (i)(3) of the general section and paragraph (l)(3) of the healthcare section pertain to employer notification requirements to employees regarding COVID-19 exposure in the workplace. An employer's obligation under this section begins whenever the employer is notified that a person at its workplace is COVID-19 positive. Subject to a limited exception with respect to certain COVID-19-positive patients in healthcare settings (discussed in further detail below), this notification obligation is triggered by *any* COVID-19-positive person at the workplace, including employees, vendors, contractors, customers, delivery people, visitors, or other non-employees, and particularly in healthcare settings clients, patients, or residents. Employers could be notified of an infected person in the workplace by numerous sources including the affected individual themselves, as well as the local or state health department, a family member of a person confirmed to have COVID-19, or another employer (e.g., an

employer of a facility where a temporary employee was working). The employer could also be notified by an employee who spoke to any of the individuals listed above (e.g., an administrative assistant), and forwarded the message to the employer. Once an employer is notified of a COVID-19-positive person at its workplace, the employer has three separate notification obligations that must be completed within 24 hours. These notification obligations are very similar under the general and healthcare sections, but with small differences. Accordingly, employers' obligations under the general section will be discussed first, followed by a discussion of the differences in the healthcare section.

First, under paragraph (i)(3)(i)(A) of the general section the employer must notify each employee who has been in close contact with the person who is COVID-19 positive. The notification to these employees must state the fact that the employee was in close contact with someone with COVID-19 along with the date(s) that the contact occurred. As defined in paragraph (b) of both the general and healthcare sections, *Close contact* means being within 6 feet of another person for a cumulative total of 15 minutes or more over a 24-hour period during that person's potential period of transmission. The potential transmission period runs from 2 days before the person feels sick (or, for asymptomatic people, 2 days prior to test specimen collection) until the time the person is isolated. Examples of cumulative exposures for 15 minutes could be 3 exposures for 5 minutes each or 1 exposure for 5 minutes and a second exposure for 10 minutes, over a 24-hour period. This definition in terms of proximity, duration, and timing of exposure is consistent with CDC's current definition of close contact, which is "an operational definition" used as the criteria for conducting contact tracing (CDC, February 25, 2021). It is based on the assumption that infection risk increases at decreased distances and increased duration of exposure to an infected person during the transmission period.

DRAFT

It is important to notify this category of employees because individuals who have had close contact with a person who is COVID-19 positive are at the highest risk of contracting COVID-19. Timely notice of potential close contact with persons who are COVID-19 positive will allow employees who have had close contact to seek medical advice and be tested. Notifying those employees about the date that contact occurred will allow them to verify that they were exposed. It also allows them to provide that information to a licensed healthcare provider or public health agency to determine factors such as optimal time for testing. In addition, this gives employees necessary information to be particularly vigilant in monitoring their own health and symptoms, and to take steps to potentially avoid exposing others in their household or community.

The second notification requirement, under paragraph (i)(3)(i)(B) of the general section, requires the employer to notify all other employees who worked in a well-defined portion of a facility (e.g., a particular floor) where the person with confirmed COVID-19 was present during the potential transmission period. As stated above, the potential transmission period runs from 2 days before the person felt sick (or, for asymptomatic people, 2 days prior to test specimen collection) until the time the person is isolated. This notification must specify the date(s) the person with COVID-19 was in the workplace during the potential transmission period. This notification is required if any person with confirmed COVID-19 (employee or non-employee) was present in a facility for any length of time, even if relatively brief.

OSHA has determined that it is important to notify this category of employees even though they are generally at lower risk of developing COVID-19 and do not meet the criteria for notification under CDC contact tracing recommendations. Notifying these employees is important because it can remind them to be aware of possible symptom development in the less

DRAFT

likely event that they do develop COVID-19. It will also allow employees who may be at risk of developing COVID-19 in special circumstances, despite the lack of close contact, to seek advice from local or public health departments. For example, CDC has stated that transmission can occur beyond 6 feet in special circumstances, particularly in enclosed spaces, during activities involving heavy breathing, such as exercise (CDC, October 5, 2020). In a fitness and exercise setting, notifying a fitness instructor about a student in the class who is COVID-19 positive would allow the instructor to seek advice from a local or public health department. CDC also notes that infections can sometimes occur from contact transmission. Thus, notifying a janitor that an office worker from a floor they service developed COVID-19 would allow the janitor to seek information about possible risk from tasks such as emptying trash contaminated with used tissues or paper towels. As indicated above, notifying those employees about the date the person with COVID-19 was in the workplace during the potential transmission period will allow them to verify that they were exposed, as well as provide the date(s) to a licensed healthcare provider or public health agency to determine factors such as optimal time for testing. Furthermore, determining which locations of a workplace a COVID-19-positive person may have visited can also inform the employer about ways to improve transmission prevention efforts, and improve the COVID-19 plan under paragraph (c) of the general and healthcare sections. For example, an employer may learn that a delivery person confirmed to have COVID-19 visited many departments throughout a building while making deliveries. Such information could help the employer realize that numbers of persons exposed could be minimized by leaving deliveries in the lobby and designating individuals from certain areas of the building to pick up deliveries while maintaining physical distance from others in the building.

DRAFT

Finally, under paragraph (i)(3)(i)(C) of the general section the employer must also notify other employers whose employees have been in close contact with the COVID-19-positive person, or worked in a well-defined portion of a facility (e.g., a particular floor) in which the COVID-19-positive person was present during the potential transmission period. Again, the potential transmission period runs from 2 days before the person felt sick (or, for asymptomatic people, 2 days prior to test specimen collection) until the time the person is isolated. The notification must specify the date(s) the person with COVID-19 was in the workplace during the potential transmission period and the location(s) where the person with COVID-19 was in the workplace. And again, this notification is required if any person with confirmed COVID-19 (employee or non-employee) was present in a facility for any length of time, even if relatively brief.

The purpose of notifying other employers whose employees had close contact with or were in the same well-defined portion of a facility as the COVID-19-positive person during the potential transmission period is to ensure that workers who are not directly employed by the business or facility (e.g., host employer) where they were potentially exposed will also be notified of exposures. Examples of employers who would need to be notified include contracting agencies, temporary staffing agencies, vendors, and delivery services. Providing them with the information required under paragraph (i)(3)(i)(C) of the general section will allow the employers and employees to determine if they could have been exposed, and will allow the employee to contact a licensed healthcare provider or local or state public health official for information to help them determine factors such as optimal time for testing. Because the host employer is the one who controls the workplace, OSHA expects that the host employer would have the details to determine which employees at the workplace could have had close contact with, and which could

DRAFT

have been in the same well-defined area as, someone who is COVID-19 positive. This would allow the host employer to inform other employers (e.g., contractors, temporary staffing agencies, vendors, delivery services) if one of their employees had close contact with or could have been in the same well-defined area as a COVID-19-positive person during their transmission period. This would then allow employers such as contractors, temporary staffing agencies, vendors, and delivery services to notify their employees, as required under paragraphs (i)(3)(i)(A) and (B) of the general section.

Each of these three notification requirements are also required of employers covered under the healthcare section, but with two important differences. First, under paragraphs (l)(3)(i)(A)-(B), employers are only required to notify employees who had a close contact or possible exposure in a well-defined portion of a facility if the employees were not wearing a respirator and any other required PPE. Similarly, paragraph (1)(3)(i)(C) only requires employers to notify other employers whose employees had a close contact or possible exposure if the employees were not wearing respirators and any other required PPE. In this provision "other required PPE" refers to the other parts of the PPE ensemble worn in addition to respirators when employees are exposed to people with suspected or confirmed COVID-19, e.g., gloves, gowns, and eye protection; it does not include face coverings. OSHA included this difference for notifications to healthcare employees because of the different knowledge and expectations of employees working in healthcare industries versus other industries. Employees in healthcare settings are more likely to expect to be exposed to ill persons as part of their job. They are also expected to have an understanding of standard and transmission-based precautions. Therefore, they have a better understanding of pre- and asymptomatic transmission and how it affects their risk of contracting COVD-19. Many times employees in healthcare settings who are wearing

DRAFT

respirators and other required PPE are doing so because they are knowingly treating suspected or confirmed COVID-19 cases (as required by paragraph (f)(2)), so there is no need to inform them of potential exposure. Other employees in healthcare settings may be wearing respirators and other PPE during aerosol generating procedures (AGPs) performed on a population that is not known or suspected to have COVID-19 (as required by paragraph (f)(3)), but they understand that the reason they are required to wear the respirator and PPE is because of a general presumption of COVID-19 exposure due to pre- and asymptomatic transmission. Thus, again, such employees do not need to be informed of a potential exposure. Finally, in some cases, employees in healthcare may only be required to wear a facemask but are wearing both a respirator and other PPE either voluntarily or at their employer's request. Employees who choose to voluntarily upgrade their PPE presumably do so based on an understanding that they could be exposed to someone who is pre- or asymptomatic, even when all the other controls (e.g., patient screening and placement) are properly implemented. An employer choosing to upgrade PPE is exceeding the minimum requirements of the standard, thus implying that such an employer is conscientious and would train employees on the possibility of pre- and asymptomatic transmission. Therefore, employees who are wearing PPE voluntarily or because their employer chose to exceed the minimum requirements of the standard are likely already aware of the potential for pre- and asymptomatic exposure and the need to be especially vigilant in screening for COVID-19 symptoms. Therefore, OSHA does not find notification of close contacts or exposures to individuals with COVID-19 necessary in these circumstances.

The second difference in the notification requirements is that the healthcare section contains an exception to all notifications required by (l)(3)(i) that is not included in the general section. That exception in paragraph (l)(3)(iii) provides that the notification provisions are not

DRAFT

triggered by the presence of a patient with confirmed COVID-19 in a workplace where services are normally provided to suspected or confirmed COVID-19 patients (e.g., emergency rooms, urgent care facilities, COVID-19 testing sites, COVID-19 wards in hospitals). This exception recognizes that the notifications required by paragraph (l)(3)(i) are not necessary in healthcare settings where employees already expect to be working near suspected or confirmed COVID-19 patients and are, therefore, already aware of their potential for exposure. However, this exception is limited to scenarios where services are normally provided to patients who are suspected or confirmed to have COVID-19 and employees are wearing respirators and other appropriate PPE. For example, a mammography center at a hospital conducts screening to identify patients who have COVID-19 and exclude them from receiving services at the center, but then learns that a COVID-19-positive person visited the center during the period of transmission. The employer would be required to notify all employees who were not wearing a respirator and other PPE and either had close contact with the person or were in the same well-defined portion of the facility as the person.

Each of these three notification requirements in both the general and healthcare sections is critical to ensuring that individuals who are at potential risk of developing COVID-19 are promptly made aware of that risk so that they can take appropriate steps to monitor their health. As previously noted, the employer is required to make all of these notifications within 24 hours of learning that a COVID-19-positive person was in the workplace. OSHA has determined that this time period is necessary to ensure that employees receive timely information about a potential risk to their own health and to the health of those around them, as the notified employees may now be infectious themselves as a result of their exposure to a COVID-19-positive person. Prompt notification would allow the employee to start taking precautions such as

DRAFT

physically distancing from household members to prevent transmission in the event that the employee is or becomes infectious. When making required notifications, employers should notify each individual in a language and manner they understand via a phone call, text message, e-mail, or in person (if using protections such as physical distancing and face coverings). However, in some cases, such as when close contact did not occur and all persons who could have been potentially exposed in a general area may not be known (e.g., bathroom, building floor), the employer could satisfy notification requirements by posting notices in languages that employees understand in common areas. This may include posting notices in break rooms, time clock areas, or restrooms.

In certain circumstances it may be difficult for employers to determine every person who is required to be notified of a COVID-19 exposure or close contact in the workplace. Employers should try and get as many details as possible about areas of the workplace visited and other areas where employees could have been exposed. Employers will often learn about a COVID-19-positive person in their workplace (e.g., a customer who shopped at their store; a delivery person), through the local public health authorities (CDC, October 22, 2020), and they should cooperate with those authorities in identifying potentially exposed employees. Employers should use reasoned judgment based on the information that is available to them in making the determination of who is required to be notified under this standard. Notification obligations exist under the standard where it is more likely than not that a COVID-19 person was either in close contact with an employee, or in the same well-defined area as an employee. However, OSHA recommends that employers should err on the side of over-inclusion where not otherwise clear and make notifications whenever it is likely that a close contact or exposure has occurred.

DRAFT

OSHA provides some examples below to help employers understand their notification obligations under this standard.

An employer at a large department store learns from the local health department that a COVID-19-positive person shopped at the department store, but only in the women's shoe department, and then left the store. Under that scenario, the employer must notify all shoe salespersons who were working at the time the infected customer shopped in the women's shoe department. The employer would also be required to notify employees who were working in the shoe stockroom and may have come into contact with items handled by the shopper and employees in other departments on the same floor that the shopper could have passed on the way in and out. The employer would also have to notify employers of contracted janitorial staff that could have handled waste generated on that floor. Where the employer can determine that one or more employees had close contact with the customer, the employer must notify those employees of the close contact. The employer would not be expected to notify employees on floors that the infected customer did not visit.

In a manufacturing setting, if an assembly line employee notifies the employer that the employee has tested positive for COVID-19, the employer must notify close contacts, including any other employees working within 6 feet of the employee with COVID-19. In addition, it is reasonable to assume brief or more distant contact with others in public spaces of the same area. Although risk of infection is lower in those cases, the possibility of transmission still exists due to factors such as inadequate ventilation or contact with contaminated surfaces. Therefore, any employees working in the general area of the manufacturing facility, in addition to employers of employees such as contractors or temporary help, must also be notified.

DRAFT

In another example, an employer of a plumber working at a new residential housing construction site learns that the plumber is COVID-19-positive. The plumber's employer contacts the general contractor of the construction site to provide it with the information. The general contractor knows that an electrician was working in the same houses as the plumber, and that they more likely than not had close contact during the period that the plumber was infectious. However neither the plumber nor the electrician were working or otherwise interacting in the same area with a crew installing drywall. In that circumstance, the general contractor would only need to contact the electrician's employer to inform it that the electrician more likely than not had close contact with a COVID-19-positive employee, during the employee's transmission period.

As a fourth example, a medical provider employer learns that a COVID-19-positive patient visited a medical office that does not normally treat suspected or confirmed COVID-19 patients during the period of transmission. The employer would notify all employees who more likely than not had close contact with the patient and were not wearing respirators and other PPE (e.g., the receptionists, nurses, doctors, phlebotomists). The employer would also notify the separate employer of contracted housekeeping staff working in the general area of the building. The employer would not have to notify a billing specialist working in a separate wing of the building that was not visited by the patient.

Paragraph (i)(3)(ii) of the general section (paragraph (l)(3)(ii) of the healthcare section) provides that notifications required by paragraph (i)(3)(i) of the general section (paragraph (l)(3)(i) of the healthcare section) must not include any employee's name, contact information (e.g., phone number, email address), or occupation. This provision is necessary to ensure that when providing notice about the potential exposure, the employer protects the infected

DRAFT

employee's identity, as required by ADA laws. To notify employees while still protecting the infected employee's identity, employers could use vague descriptions such as "a person confirmed to have COVID-19 was recently in the workplace and you may have been exposed." However, OSHA is aware that even if no personal identifying information is provided, other employees may be able to figure out the identity of the person with COVID-19. For example, at a small business, it may be obvious that a certain employee has not been reporting to work. As long as the employer does not reveal any of the personal identifying information described above and has made a good faith effort to comply with this provision, the employer will be considered to have complied with this provision even if it is possible for others to figure out the identity of the affected employee. However, the employer should review other guidance from other relevant agencies, such as the EEOC, to make sure it is in compliance with any other applicable privacy laws (EEOC, December 16, 2020). Paragraph (l)(3)(ii) of the healthcare section is not intended to preclude the sharing of information that is permitted between medical providers under the Health Insurance Portability and Accountability Act (HIPAA).

DRAFT

Medical removal from the workplace

Paragraph (i)(4) of the general section (paragraph (l)(4) of the healthcare section) contains requirements regarding medical removal of employees from the workplace. Where the ETS requires removal of employees, it means complete removal from the workplace; isolation within the workplace is insufficient.

There are three triggers for employer obligations under this paragraph. The first is if an employer knows that an employee is COVID-19 positive (i.e. the employee meets the criteria in paragraph (i)(2)(i) of the general section (paragraph (l)(2)(i) of the healthcare section)). The second is if an employer knows that an employee meets the criteria in paragraph (i)(2)(ii)

through (i)(2)(iv) of the general section (paragraph (l)(2)(ii) through (l)(2)(iv) of the healthcare section —that is, the employee has been told by a licensed healthcare provider that they are suspected to have COVID-19; they are experiencing recent loss of taste and/or smell with no other explanation; or they are experiencing both fever (≥100.4° F) and new unexplained cough associated with shortness of breath. The third is if an employer is required to notify an employee of close contact in the workplace to a person who is COVID-19 positive in accordance with paragraph (i)(3)(i)(A) of the general section (paragraph (l)(3)(i)(A) of the healthcare section). These triggers result in different exclusion requirements.

Under the first trigger, where an employer knows an employee is COVID-19 positive, paragraph (i)(4)(i) of the general section (paragraph (l)(4)(i) of the healthcare section) requires the employer to immediately remove the employee from the workplace and keep the employee removed until the employee meets the return-to-work criteria in paragraph (i)(6) (paragraph (l)(6) of the healthcare section), as discussed below. OSHA determined that directing an employee who is COVID-19 positive to stay home until return-to-work criteria are achieved is critical to preventing the transmission of COVID-19 in the workplace.

Following the second trigger, when an employer knows that an employee meets the criteria in paragraph (i)(2)(ii) through (i)(2)(iv) (paragraph (l)(2)(ii) through (l)(2)(iv) of the healthcare section), paragraph (i)(4)(ii) of the general section (paragraph (l)(4)(ii) of the healthcare section) requires the employer to immediately remove the employee from the workplace. The employer then may choose between two options. The first option, described in paragraph (i)(4)(ii)(A) of the general section (paragraph (l)(4)(ii)(A) of the healthcare section), is to keep the employee removed until the employee meets return-to-work criteria. The second option, described in paragraph (i)(4)(ii)(B) of the general section (paragraph (l)(4)(ii)(B) of the

DRAFT

healthcare section), is to provide a COVID-19 test at no cost to the employee and keep the employee removed until the employer is notified by the employee of the test results. If the test results are negative, the employee may return to work immediately. If the test results are positive, the employer must comply with paragraph (i)(4)(i) of the general section (paragraph (l)(4)(i) of the healthcare section) and keep the employee removed until the employee meets return-to-work criteria. If the employee refuses to take the test, the employer must continue to keep the employee removed from the workplace until return-to-work criteria are met, but is not obligated to provide the medical removal protection benefits described in paragraph (i)(5)(iii) of the general section (paragraph (l)(5)(iii) of the healthcare section). Additionally, absent undue hardship, employers must make reasonable accommodations for employees who cannot take the test for religious or disability-related medical reasons. For example, in such circumstances OSHA would expect the employer to consider accommodations such as providing a different kind of test or medical evaluation that does not raise the same religious or medical concerns; making arrangements for the employee to work in isolation or remotely; or proceeding as if the test results were positive, and keeping the employee removed until return-to-work criteria are met, while providing medical removal protection benefits.

Following the third trigger, when an employer is required to notify an employee of close contact in the workplace with a person who is COVID-19 positive, paragraph (i)(4)(iii)(A) of the general section (paragraph (l)(4)(iii)(A) of the healthcare section) requires the employer to immediately remove the employee from the workplace. The employer then has a choice between two different actions. The first option is that the employer may keep the employee removed from the workplace for 14 days. The second option is to keep the employee removed and provide a COVID-19 test, at no cost to the employee, at least 5 days after the exposure that triggered the

DRAFT

notification requirement. If the test results are negative, the employee may return to work after 7 days have passed following the exposure. If the test results are positive, the employer must comply with paragraph (i)(4)(i) of the general section (paragraph (l)(4)(i) of the healthcare section) and keep the employee removed until the employee meets return-to-work criteria specified in paragraph (i)(6) of the general section (paragraph (l)(6) of the healthcare section). If the employee refuses to take the test, the employer must continue to keep the employee removed from the workplace for 14 days, but is not obligated to provide the medical removal protection benefits described in paragraph (i)(5)(iii) of the general section (paragraph (l)(5)(iii) of the healthcare section). Absent undue hardship, employers must make reasonable accommodations for employees who cannot take the test for religious or disability-related medical reasons, as described above.

Paragraph (i)(4)(iii)(B) of the general section (paragraph (l)(4)(iii)(B) of the healthcare section) contains an exception to the removal requirements following the third trigger. An employee who would otherwise be required to be removed after exposure in the workplace does *not* need to be removed if the employee does not have a recent loss of taste and/or smell or fever combined with cough and shortness of breath, *and* the employee has been fully vaccinated against COVID-19 (meaning at least two weeks have passed after receiving the final dose) or the employee has had COVID-19 and recovered from it within the past 3 months. OSHA included this exception for fully vaccinated employees because it is consistent with CDC recommendations, as described in more detail in *Need for Specific Provisions* (Section V of the preamble). The exemption for asymptomatic employees who were confirmed to have COVID-19 and recovered within the last three months from removal is also consistent with CDC recommendations. As explained in more detail in Section V, the CDC has analyzed accumulating

DRAFT

evidence indicating that persons who have recovered from laboratory confirmed COVID-19 and remain symptom-free may not have to quarantine again if exposed within three months of the illness. Although the evidence does not definitively demonstrate the absence of reinfection within a three-month period, CDC concluded that the benefits of avoiding unnecessary quarantine likely outweigh the risks of reinfection as long as other precautions such as physical distancing, face coverings, and hygiene continue to be implemented. OSHA will continue to follow this issue closely and will make adjustments to the ETS or modify enforcement activities as appropriate when additional information becomes available and/or if the CDC recommendations are updated.

OSHA identified the triggers for medical removal to create a policy that ensures the safety of other employees in the workplace, consistent with economic feasibility constraints and the employer's need to maintain a sufficient workforce to continue operations. OSHA determined that requiring the removal of employees who are COVID-19 positive or who are suspected to be COVID-19 positive based on medical advice is essential to prevent the transmission of the virus that causes COVID-19 through the workplace. Employees who are confirmed COVID-19 positive pose a clear and direct hazard to their co-workers, and those who are suspected to be COVID-19 positive also present a significant hazard to their co-workers because of the likelihood that they do, in fact, have COVID-19.

Removal of employees based on symptoms is less straightforward because many symptoms of COVID-19 are common with other diseases or health conditions. As explained above in the section on notification requirements, OSHA determined it would not be feasible or reasonable to require the removal of any employee who merely experiences *any* symptom of COVID-19, because many COVID-19 symptoms are also symptoms of less dangerous illnesses

DRAFT

such as the common cold or conditions that are not infectious, such as allergies. Therefore, removing any employee experiencing these symptoms alone would likely mean the removal of many employees who do not have COVID-19, which could be unduly burdensome to the employer. As discussed in *Need for Specific Provisions* (Section V of the preamble), OSHA identified the symptoms of recent loss of taste and/or smell and fever coupled with new unexplained cough and shortness of breath as removal triggers because this symptom or symptom combination is highly specific for COVID-19, and under the scenarios of the studies described in Section V, would likely result in the removal of relatively few employees who do not have COVID-19.

OSHA encourages employers who are able to do so to have a more robust program of medical removal. To this end, a note to paragraph (i)(4)(ii) of the general section (paragraph (l)(4)(ii) of the healthcare section) explains that the symptoms OSHA has selected as requiring removal constitute only a partial list of the symptoms that CDC has recognized as being COVID-19 symptoms. Employers may choose to go beyond the minimum requirements laid out in the ETS and remove employees who display additional symptoms from the CDC list (such as chills, fatigue, or congestion; fever in the absence of cough; or cough in the absence of fever) or refer those employees to a healthcare provider.

OSHA has also determined that individuals who have had close contact with someone in their workplace who is COVID-19 positive are at risk of contracting COVID-19. As has been established in Section IV of this preamble, *Grave Danger*, COVID-19 readily transmits in workplaces where employees come into contact with co-workers and the public, often for extended periods of time and often in areas that are poorly ventilated. Thus, if an employee has had a close contact in the workplace, the likelihood that they may be COVID-19 positive is

DRAFT

sufficiently high that the employee should be removed from the workplace, pending the results of a COVID-19 test, in order to mitigate any risk of transmission to other employees. OSHA determined that requiring removal of these employees, at least until the employee has received a negative COVID-19 test, strikes the appropriate balance between reducing the risk to others in the workplace and maintaining adequate staffing. As discussed above, employees who have been fully vaccinated or who have recently recovered from COVID-19 need not be removed at all, as long as they are not experiencing a recent loss of taste and/or smell or fever combined with cough and shortness of breath because of the lower likelihood that they would have COVID-19 at this time. The time frames for testing and return to work of employees in the third category are drawn from CDC guidance, and the scientific rationale supporting those time frames is discussed in *Need for Specific Provisions* (Section V of the preamble).

Finally, paragraph (i)(4)(iv) of the general section (paragraph (l)(4)(iv) of the healthcare section) provides that whenever an employee is removed from the workplace as outlined above, the employer may require the employee to work remotely or in isolation, if suitable work is available. For example, an employee who ordinarily performs customer service functions at a call center could be required to work from home as long as the appropriate technology is available. This provision helps ensure business continuity by allowing a job function to be performed when the employee is able to work from home. In cases where working remotely is not possible, OSHA encourages employers to consider flexible and creative solutions. For example, a temporary reassignment to a position that can be performed by telework might be a possibility. However, if an employee is too ill to work, remote work should not be required; and sick leave or other leave should be made available as consistent with the employer's general policies and any applicable laws.

DRAFT

OSHA's removal requirements as outlined in this paragraph are intended to set the floor for what is required; however, as stated above OSHA encourages employers who are able to do so to have a more robust program of medical removal, as indeed some employers have already done. In addition to removal based on other COVID-19 symptoms, employers may consider removal based on certain exposure or close contacts employees have had outside of the workplace. Similarly, employers may consider removal of employees if the employer learns that the employee was notified by a state or local public health authority to quarantine or isolate; the employer might even be contacted by such an authority directly. Although the ETS does not require removal in those situations, the state or local health public health authority may impose separate obligations or the employer might chose to remove employees in those circumstances, above and beyond what is required by this ETS.

Medical removal protection benefits

Paragraph (i)(5) of the general section and paragraph (l)(5) of the healthcare section require, with some limitations, that employers continue to pay employees who have been removed from the workplace under the medical removal provisions found in paragraph (i)(4) of the general section (paragraph (l)(4) of the healthcare section). OSHA determined that requiring continued pay for removed employees under the listed circumstances is necessary to ensure that employees do not refrain from reporting their COVID-19-positive status or symptoms out of the fear of losing essential income. It is also necessary to ensure that during contact tracing, COVID-19-positive employees do not refrain from reporting close contacts with their co-workers out of fear that those co-workers will suffer a loss of pay.

The requirement to maintain pay for removed workers applies to employers that have more than 10 employees on the date the section becomes effective. OSHA created this exception

DRAFT

for very small employers – those with 10 or fewer employees – to ensure consistency with the exceptions in other parts of the ETS. As noted earlier, the ETS does not require these small employers to maintain written COVID-19 plans (paragraph (c)(2) of the general and healthcare sections), and exempts them from certain recordkeeping requirements (paragraphs (n)(1) and (q)(1)). OSHA acknowledges the concern that removal may leave smaller employers without an adequate workforce to continue operations in some cases. For instance, even a small outbreak at a firm with fewer than 10 employees can lose a large percentage of its current staff (e.g. one confirmed positive case and 2 additional employees removed due to close contact) with their specific knowledge of the firm's operations. OSHA also created the exception because, compared to larger employers, employers with 10 or fewer employees tend to have smaller profit levels and fewer financial resources and are more vulnerable to unexpected economic outlays (Bartik et al., 2020). Several small business surveys indicate that securing loans and raising capital is particularly difficult for this sector (Guidant Financial, 2021; Biz2Credit, 2021). Although these very small businesses would be eligible to receive tax credit offsets, and are encouraged to take advantage of them, their business size would make them particularly susceptible to any significant duration of time between the outlay of pay to removed employees and the receipt of tax offsets. OSHA is therefore requiring medical removal protection benefits to be paid only by employers that have more than 10 employees.

When an employee is working remotely or in isolation in accordance with paragraph (i)(4)(v) of the general section (paragraph (l)(4)(iv) of the healthcare section), the employer must continue to pay that employee the same regular pay and benefits the employee would have received had the employee not been absent from work, until the employee meets the return-to-work criteria discussed below. If the employee is able to work remotely or in isolation, then the

DRAFT

employee is entitled to payment for all time worked, including overtime, when applicable. When an employee has been removed from the workplace under paragraph (i)(4) of this section (paragraph (l)(4) of the healthcare section) (i.e., and is not working remotely or in isolation), the employer must also continue to pay the employee the same regular pay and benefits the employee would have received had the employee not been absent from work, but that regular pay does not include overtime pay even if the employee had regularly worked overtime hours in recent weeks. If an employee is removed from work multiple times as required by the ETS, such as because of being exposed at different times at the workplace to people with COVID-19, the employer must pay the employee during removal on each occasion.

When an employee has been removed and is not able to work remotely or in isolation, however, the amount the employer is required to pay is capped at a maximum per week. The employer must pay up to this amount, based on the employee's normal wages and benefits, until the employee meets the return-to-work criteria. OSHA acknowledges the payment of medical removal protection benefits for large swaths of the workforce and for extended periods of time may pose economic feasibility concerns absent a source of funding, particularly for smaller employers. The cap on medical removal protection benefits is therefore intended to be within the amount of tax credits made available to employers in the American Rescue Plan Act of 2021 ("ARP"), Public Law No: 117-2. The cap amounts are specified in both the general and healthcare sections of the ETS under paragraphs (i)(5)(iii)(A) and (B).

For all employers, the cap is $1,400 per week per employee for the first two weeks of removal. OSHA considered two analyses in determining the level at which to set the cap. First, an analysis by the Council of Economic Advisers (CEA) found workers well into the middle class were "liquidity constrained," and therefore would be responsive to the incentives of

DRAFT

medical removal pay (CEA February 2021). Based on an analysis of the expected cost of MRP versus income distribution, CEA found that a minimum threshold of $1,300 per week appropriate. It also noted a number of factors that would support increasing the threshold, including that higher earners are more likely to be able to telework, the advent of rapid testing, and the spread of vaccination, all of which lower the cost of MRP. OSHA also conducted an analysis showing that a cap of $1,400 per week which showed that approximately 84% of affected workers would have their entire salary covered by the cap (OSHA, 2021 – forthcoming memo explaining the calculation). Based on these analyses, OSHA finds that a cap at $1,400 per week insures the incentive effects of full replacement pay are felt by a large majority of the affected workforce, and that higher level is not necessary to ensure reporting given the greater availability of telework and lower liquidity concerns of higher paid workers.

For employers with fewer than 500 employees, the cap is $1,400 per week for the first two weeks an employee is removed from work, but is reduced to $200 a day (equivalent to $1000 per week over a 40-hour, 5-day work week) beginning in the third week, if the employee's removal continues that long. This lower cap amount beginning in the third week is consistent with the maximum amount of tax credits that employers with fewer than 500 employees may claim after the first 80 hours of leave under the ARP. Larger employers with 500 or more employees must continue to pay up to $1,400 per week even after the initial two weeks an employee is removed from work. (The cap does not preclude employers from paying more than this amount, however.) OSHA expects most employees should be able to return to work within 10 days of developing symptoms or 14 days (2 work weeks) from removal, and only a relatively small number will need to remain out for a longer period of time because of COVID-19 symptoms.

DRAFT

Paragraph (i)(5)(iv) (paragraph (l)(5)(iv) of the healthcare section) provides that if an employee who has been removed from the workplace and is not working remotely or in isolation receives compensation for lost earnings from any other source, such as employer-paid sick leave, administrative leave, weather and safety leave, or a publicly funded compensation program, then the employer may reduce the amount paid to the removed employee by however much the employee receives from the outside source. For example, if a removed employee who is not working remotely or in isolation has accumulated paid sick leave, the employer may require the employee to use that paid sick leave before paying medical removal benefits under this paragraph. If an employee has paid leave available, but the employer is unable to require the employee to use the leave (as may be the case with federal employers) and the employee opts not to use it, then the employer may still reduce the amount paid under this paragraph by the amount of paid leave the employee has available but is opting not to use. Likewise, if a removed employee receives, for example, $300 a week from a state or local government benefits program for quarantined or isolated employees, the employer's obligation to pay medical removal benefits to the removed employee would be reduced by $300 per week. Additionally, if the employee is able to earn money because of the removal that was not previously possible – such as by picking up part-time work from home from another employer – then the employer may reduce the amount of benefits paid accordingly.

OSHA recognizes that certain employees who are COVID-19 positive may be required to be removed from the workplace for some time. For example, as explained in *Need for Specific Provisions* (Section V of the preamble), some people such as those with severe illness or immune disorders might be infectious and need to be removed for 20 days or more. However, most employees required to be removed will be out of the workplace for a relatively short period of

DRAFT

time, and can return to work after as little as ten days from their positive test or from when symptoms first appeared, as described further in the discussion of paragraph (i)(6) of the general section (paragraph (l)(6) of the healthcare section), below. Employees removed under paragraph (i)(4)(iii)(A) of the general section (paragraph (l)(4)(iii)(A) of the healthcare section) after close contact with a COVID-19-positive person in the workplace can return to work as soon as seven days after the close contact if their employer-provided COVID-19 test is negative. Additionally, an employer's obligation to provide paid medical removal benefits ends when an employee meets the return-to-work criteria (i.e., is no longer likely infectious), even if the employee is experiencing persistent debilitating effects of the disease and is unable to work for that reason. If a state or local health department requires an employee to continue isolating after the return-to-work criteria in this ETS are met, those entities may impose separate requirements, but the ETS would not require the employer to continue providing paid medical removal benefits.

Under paragraph (i)(5)(v) of the general section (paragraph (l)(5)(v) of the healthcare section), when employees return to work after their removal period, they must not be subject to any adverse action or deprivation of rights or benefits because of their removal. This means that an employer cannot take actions such as terminating the employment of a removed employee or demoting the employee to a lower-paying position, regardless of the length of time spent away from the workplace. Protecting employees' job status and prohibiting adverse actions by the employer as a result of a COVID-19-related exclusion is crucial for ensuring that employees report COVID-19-positive status or symptoms to the employer. If employees fear job loss or other adverse actions as a result of removal for a COVID-19-related reason, they will likely be reluctant to make these reports. OSHA realizes there may be situations where an employee with COVID-19 is out of work for months before they are well enough to return to work, and the

DRAFT

employer may need to fill the employee's position during the removal period. In this situation, OSHA would expect that the employer would fill the position with a temporary employee, who is made aware that the temporary assignment will end once the removed employee returns to work. The removed employee's position should not be permanently filled by a replacement unless the employee notifies the employer, or the employer is able to verify, that the employee will not be returning to their former position. The provision is consistent with Section 11(c) of the OSH Act, 29 U.S.C. 660(c)(1), which prohibits discrimination or discharge of any employee for exercising any right afforded under the Act.

Return to work

Paragraph (i)(6) of the general section (paragraph (l)(6) of the healthcare section) contains requirements related to an employee's return to work after a COVID-19-related workplace removal. It provides that an employer's decision to return an employee to work must be made in accordance with guidance from a licensed healthcare provider or applicable guidance from the CDC which are incorporated by reference (CDC, August 10, 2020; CDC, December 3, 2020a; CDC, February 18, 2021), unless state or local public health authorities specify a longer period of removal. The purpose of this provision is to ensure that an employee who has or likely has COVID-19 does not return to work until it is highly likely that there is no longer a significant risk of transmitting disease.

CDC's recommendations for isolation are only broad guidance; the appropriate duration for any given individual may differ depending on factors such as disease severity or the health of the employee's immune system. For this reason, the ETS requires that employers make decisions about an employee's return to work in accordance with guidance from a licensed healthcare provider (who would be better acquainted with a particular employee's condition) or CDC

DRAFT

guidance. For example, the "CDC's Isolation Guidance," referenced in paragraph (i)(6) of the general section (paragraph (l)(6) of the healthcare section) states that a COVID-19-positive person can stop isolating when three criteria are met: (1) at least ten days have passed since the first appearance of the person's symptoms; (2) the person has gone at least 24 hours without a fever (without the use of fever-reducing medication); and (3) the person's other symptoms of COVID-19 are improving (excluding loss of taste and smell). If a person has tested positive but never experiences symptoms, then the person can stop isolating after ten days from the date of their positive test. If a licensed healthcare provider recommends a longer period of isolation for a particular employee, however, then the employer would need to abide by those longer periods rather than returning the employee to work after ten days. Employers are also free to require employees to remain removed for a longer period than the ETS requires. For example, an employer that serves a vulnerable population of clients may want to use extra caution and require employees to stay isolated past the time when a licensed healthcare provider says the employee may return to work. The employer's obligation to pay medical removal benefits under paragraph (i)(5)(iii) of the general section (paragraph (l)(5)(iii) of the healthcare section) ceases when the employee meets the return-to-work criteria listed in paragraph (i)(6) of the general section (paragraph (l)(6) of the healthcare section), even if the employer chooses to require a longer removal period.

Finally, in a note to paragraph (i) of the general section, OSHA recognizes that CDC's "COVID-19 Critical Infrastructure Sector Response Planning" allows asymptomatic exposed workers, who have not tested positive, as a last resort, to avoid quarantine, if the workers' quarantine may cause serious harm or danger to public health or safety and when additional precautions are implemented to protect the exposed workers and the community

DRAFT

(CDC, December 3, 2020b). In a similar note to paragraph (l) of the healthcare section OSHA recognizes that CDC's "Strategies to Mitigate Healthcare Personnel Staffing Shortages" allows elimination of quarantine for certain healthcare workers, but only as a last resort**,** if the workers' absence would mean there are no longer enough staff to provide safe patient care, specific other amelioration strategies have already been tried, patients have been notified, and workers are utilizing additional PPE at all times (CDC, March 10, 2021). OSHA recognizes that in these limited circumstances, there are different feasibility constraints, as contemplated by the CDC, may be appropriate, and OSHA will enforce the requirements of paragraph (i) and paragraph (l) in accordance with these considerations.

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*Vaccination*

Vaccination is a vital tool that will help reduce the presence and severity of COVID-19 cases in the workplace, and serves as the final layer of protection in a workplace COVID-19 infection-prevention program. As discussed further in *Need for Specific Provisions* (Section V of the preamble), vaccination protects employees from developing COVID-19, or from developing a severe case of the disease if they do contract it. Paragraph (j) of the general section (paragraph (m) of the healthcare section) provides that, when an employer makes the COVID-19 vaccine

DRAFT

available to employees, whether on-site or at an off-site location, the employer must pay for all costs associated with vaccination. OSHA has determined, however, that requiring employers to make the COVID-19 vaccine available to their employees is not feasible because most employers lack control over how vaccines are administered (i.e., administration is handled by state or local government entities). When an employer does facilitate vaccination among its employees, OSHA believes that offering the vaccine at no cost will encourage employees who can be safely vaccinated to do so. The importance of removing cost barriers to safety measures is discussed in more detail in the *Summary and Explanation* for Requirements implemented at no cost to employees.

Under paragraph (b) of the general and healthcare sections, the term *vaccine* as used in this ETS is defined as a biological product authorized or licensed by the FDA to prevent or provide protection against COVID-19, whether the substance is administered through a single shot or a series of shots. As of March 1, 2021, there are three vaccines authorized by the FDA for emergency use to prevent COVID-19 that therefore meet the definition of COVID-19 vaccine as used in this ETS: the Pfizer-BioNTech vaccine, the Moderna vaccine, and the Johnson & Johnson (Janssen) vaccine, which received Emergency Use Authorizations (EUA) on December 11, 2020, December 18, 2020, and February 27, 2021, respectively (CDC, December 30, 2020; Oliver et al., 2020; Oliver et al., 2021; McClung et al., November 27, 2020; FDA, December 2020; FDA, January 2021; FDA, February 27, 2021). Any vaccine subsequently authorized or licensed for use by the FDA would also meet the definition of vaccine used in this standard. The definition of vaccine includes substances that are administered through a single shot or a series of shots. Therefore, when more than one shot is required by the FDA for a particular type of vaccine, all the requirements discussed below apply to the entire series of shots. Currently the

DRAFT

Pfizer-BioNTech and Moderna vaccines require a series of two shots, and the Johnson & Johnson (Janssen) vaccine only requires one shot.

Paragraph (j) of the general section (paragraph (m) of the healthcare section) provides that when an employer makes a vaccine available to its employees, either at the workplace or off-site, the employer must do so at no cost to the employees. This provision intends to capture situations in which the employer has undertaken some effort to facilitate vaccination of its employees by, for example, hosting a vaccine clinic at the workplace (e.g., mobile trailer), or partnering with another entity, such as a pharmacy or health care provider, so that employees can be vaccinated at the workplace or at an off-site location. It should be noted that if an employer chooses to make the vaccine available to its employees, it must facilitate the full vaccination (i.e., both doses in a vaccination series, if applicable), again at no cost to its employees.

If an employer makes a vaccine available to employees, either at the workplace or at an off-site location, the employer must pay for all costs associated with the vaccine. When providing the vaccine either at the workplace or off-site, this requirement would include all costs in the form of wages for time spent related to the vaccination appointment(s), such as registering, completing required paperwork, all time spent at the vaccination site (e.g., receiving the vaccination dose, post-vaccination monitoring by vaccine provider), any copays incurred by employees, and any vaccine administration costs or other costs charged by the vaccine provider. In some cases, there may not be a vaccine administration fee (e.g., if the government is reimbursing the vaccine provider for administrative costs). In which case, there would be no vaccine administration costs for the employer to pay. However, if the vaccine provider does charge a fee, the employer would need to cover this cost. Where a vaccine requires a series of shots the employer's obligation to pay for all time and costs applies equally to each required

DRAFT

shot. Additionally, if the employer chooses to make the vaccine available outside of work hours, the employer would also be responsible for costs associated with the employee receiving the vaccine, such as applicable wages.

If the employer makes the vaccine available to its employees off-site, in addition to the costs described above, the employer must also cover all costs associated with traveling to and from the vaccination site. This applies to situations in which employees have to travel to an off-site location like a pharmacy, or situations in which an employee working remotely (e.g., telework) or in an alternate location must travel to the workplace to receive the vaccine.

Paragraph (j) of the general section (paragraph (m) of the healthcare section) does not require employees to be vaccinated for COVID-19. Employers should consult applicable law and/or labor management contracts concerning employee vaccination. While OSHA encourages all eligible employees to take advantage of the protection offered by vaccination, the agency recognizes that some employees may decline vaccination for a number of reasons, including underlying medical conditions or religious objections. At the same time, nothing in the ETS precludes an employer from offering incentives beyond the requirement of this standard for employees to get vaccinated, as appropriate under applicable laws and/or labor management contracts. The EEOC provides guidance on COVID-19 vaccination as it relates to equal employment opportunity laws (EEOC, December 16, 2020).

DRAFT

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*Training*

Training is critical to controlling the spread of COVID-19 in the workplace and an important component of the COVID-19 program required by this ETS. Paragraph (c) of the general and healthcare sections requires employers to develop and implement workplace-specific COVID-19 plans. As part of developing their plans, employers must conduct a hazard

DRAFT

assessment to identify potential workplace hazards related to COVID-19. This hazard assessment will help employers identify the specific hazards their employees face and ensure the employers' COVID-19 plans are appropriately tailored to the workplace. The hazard assessment will also help employers develop workplace-specific policies and procedures to mitigate the risk of COVID-19 transmission. Training on these policies and procedures is an essential part of this ETS because it helps to ensure that employees understand the sources of potential exposure to COVID-19, the workplace-specific control measures implemented to reduce exposure to the hazard, and the requirements of this ETS. The effectiveness of the ETS would be undermined if employees did not have sufficient knowledge and understanding of all aspects of the COVID-19 policies and procedures implemented by their employers for recognizing and preventing potential occupational exposures to COVID-19.

Accordingly, paragraph (k)(1) of the general section (paragraph (n)(1) of the healthcare section) requires employers to provide training to each employee. The training employers provide pursuant to these paragraphs must be in a language and at a literacy level the employee understands. Additionally, the employer must ensure the employee comprehends all of the training elements required in these paragraphs. If an employer has employees that speak different languages or are at different literacy levels, the employer must ensure all training materials are presented in a way that each employee can understand. This may require an employer to create different training materials for different groups of employees (e.g., materials in different languages). When translation of training materials is required, employers must ensure the translation is one the employees can clearly understand. Training employees in a manner they understand enables employees to maximize the effectiveness of the workplace controls they utilize and helps ensure that the employer's training program is successful.

DRAFT

The implementation of training programs, including how training is conducted and by whom, may vary based on the size and type of workplace or business, and employers have some flexibility to adapt training to their specific workplace. However, employers must ensure each of their employees comprehend the training elements required in this ETS. Under the general section, those key elements are listed in paragraphs (k)(1)(i)-(xii). Employers can offer training in a variety of formats, including online, virtual, instructor-led, or application-based methods, but employers must ensure that employees comprehend the training materials. Following training, employees must be able to demonstrate their understanding of the materials. There are different ways employers can ensure comprehension of the training materials, including a knowledge check (e.g., written or oral assessment) or discussion after the training. Post-training assessments may be particularly useful for ensuring employee participation and comprehension when employers offer online training.

Employers covered under the healthcare section are responsible for ensuring their employees comprehend the training elements in that section (i.e., paragraphs (n)(1)(i)-(xiii)). However, given the more detailed training required under the healthcare section, including training on the policies and procedures to adhere to standard and transmission-based precautions required by paragraph (e), paragraph (n)(3) also requires employers to ensure training is overseen or conducted by a person knowledgeable in the covered subject matter as it relates to the employee's job duties. This individual must be knowledgeable about the various requirements described in the healthcare section, including all provisions within paragraph (n), as well as infection control policies and procedures. Additionally, paragraph (n)(4) of the healthcare section requires employers to ensure training provides an opportunity for interactive questions and answers with a person knowledgeable in the covered subject matter as it relates to the

DRAFT

employee's job duties. For example, an employer could utilize a virtual or online training but would need to ensure that training includes the ability to ask questions and receive answers. In order to ensure that employees comprehend the material presented during training, especially given the increased exposure risk in these industries, it is critical that employees have the opportunity to ask questions and receive answers promptly. When video- or computer-based trainings are used, this may require the employer to make available a qualified trainer to address questions after the training, or to offer a telephone hotline where employees can ask questions.

Paragraph (k)(1)(i) of the general section (paragraph (n)(1)(i) in the healthcare section) requires employers to provide a general explanation of COVID-19, including how the disease is transmitted (including pre-symptomatic and asymptomatic transmission), the importance of hand washing and how to effectively wash hands, ways to reduce the risk of spreading COVID-19 through good respiratory etiquette, the signs and symptoms of the disease, risk factors for severe illness, and when to seek medical attention, as part of their training materials. Additional information about COVID-19 that may aide employers in providing this portion of the training can be found in *Grave Danger* (Section IV of the preamble) and in various COVID-19-related guidance from the CDC (CDC, October 28, 2020; CDC, December 22, 2020; CDC, February 3, 2021; CDC, December 31, 2020; CDC, January 8, 2021; CDC, April 22, 2020; CDC, November 24, 2020). Employers should stay updated and inform employees on the latest guidance from the CDC related to COVID-19 to ensure that their training features the most up-to-date information available.

Paragraph (k)(1)(ii) of the general section (paragraph (n)(1)(iii) of the healthcare section) requires employers to provide employees with an explanation of the tasks and situations in the workplace that could result in potential COVID-19 infection. Employees' job duties affect their

DRAFT

level of occupational risk. Therefore, employee training will vary based on the workplace and the employee's job duties. Occupational risk may also change as employees take on different tasks, requiring the employer to provide additional training. For example, if cross-training on multiple job tasks or functions is occurring due to increased employee shortages and absenteeism related to COVID-19 illness, quarantine, or isolation, employers must ensure that each employee receives training about potential COVID-19 exposure for all job tasks and duties they are asked to engage in. The hazard assessments required by paragraph (c)(4) of the general and healthcare sections will help employers determine employees' potential workplace exposure to COVID-19 and, consequently, the training they will need to receive.

OSHA recognizes that COVID-19 control practices rely upon a multi-layered and overlapping strategy of controls. Thus, paragraph (k)(1)(iii) of the general section (paragraph (n)(1)(iv) of the healthcare section) requires employers to provide training on all workplace-specific policies and procedures to prevent the spread of COVID-19 that are applicable to the employee's duties. This may include training on policies and procedures related to physical distancing, physical barriers, and other COVID-19-related control measures in the workplace. Employees play a particularly important role in reducing exposures because appropriate application of work practices and controls determine exposure levels. As such, training in those practices and controls is necessary for employees to implement them effectively.

Paragraph (k)(1)(iv) of the general section requires employers to provide training on employer-specific policies and procedures for face coverings and face shields worn to comply with this section, including when they are required for protection against COVID-19; limitations on their protection against COVID-19; how to properly put them on, wear them, and take them off; and how to properly care for, store, clean, maintain, and dispose of them. The *Summary and*

DRAFT

*Explanation* for Face Coverings provides additional information regarding the requirements for wearing face coverings and face shields. Employers can also find more information on face coverings and face shields, including how to properly care for, store, clean, and maintain these items in various CDC guidance documents (CDC, October 28, 2020b; CDC, February 10, 2021; CDC, February 18, 2021).

Some non-COVID-19 workplace hazards require the use of personal protective equipment (PPE). When employees have job tasks requiring the use of PPE for a non-COVID-19-related reason, paragraph (k)(1)(v) of the general section requires that employers train those employees on any modifications to PPE donning, doffing, cleaning, storage, maintenance, and disposal procedures needed to address COVID-19. This means that when employees are using PPE for non-COVID-19 occupational hazards, employers must train those employees on how to prevent the transmission of COVID-19 associated with their use of that PPE. As an example, in a construction setting, employees may have to wear respiratory protection because of other occupational hazards (e.g., crystalline silica dust). Employers must provide those employees training on additional precautions related to the proper use, limitations, location, handling, decontamination, storage, maintenance, removal, and disposal of their PPE to reduce transmission of COVID-19 associated with their use of respiratory protection. Employers must remain in compliance with all other applicable OSHA standards, such as the PPE (29 CFR 1910.132), Eye and Face Protection (29 CFR 1910.133), Respiratory Protection (29 CFR 1910.134), and Hand Protection (29 CFR 1910.138) Standards.

Paragraph (f) of the healthcare section contains PPE requirements associated with COVID-19 in healthcare and associated industries. Paragraph (n)(1)(vi) of the healthcare section requires employers to provide training on employer-specific policies and procedures for PPE

DRAFT

worn to comply with the healthcare section of this ETS. Specifically, paragraphs (n)(1)(vi)(A-D) mandate that this training cover when PPE is required for protection against COVID-19; limitations of PPE for protection against COVID-19; how to properly put on, wear, and take off PPE; and how to properly care for, store, clean, maintain, and dispose of PPE. Additionally, paragraph (n)(1)(vi)(E) of the healthcare section requires that employers provide training on any modifications to donning, doffing, cleaning, storage, maintenance, and disposal procedures needed to address COVID-19 when PPE is worn to address workplace hazards other than COVID-19. The S*ummary and Explanation* for Personal Protective Equipment provides additional information on PPE requirements in healthcare and associated industries.

Paragraph (c)(7)(ii) of the general and healthcare sections requires employers to establish policies and procedures to minimize the risk of transmission of COVID-19 to employees from other people who enter the workplace, including how employers will encourage or require those people to use face coverings. Paragraph (k)(1)(vi) of the general section (paragraph (n)(1)(vii) of the healthcare section) requires employers to train employees on employer-specific policies and procedures regarding expectations for the use of face coverings by other people who enter the workplace. The training must also address how employees are expected to respond in the event that people entering the workplace do not follow those policies and procedures, and how employers intend to minimize employee exposure to COVID-19 hazards from any person not wearing a face covering. For example, if a retail employer has a policy requiring customers to wear face coverings when they enter the establishment, employees must receive training that explains how they should handle a situation where a customer is not wearing a face covering, as well as training on how to minimize their exposure to COVID-19 should that occur.

DRAFT

Paragraph (k)(1)(vii) of the general section (paragraph (n)(1)(viii) of the healthcare section) requires employers to train each employee on workplace-specific policies and procedures for cleaning and disinfection. This training must be consistent with the cleaning and disinfection requirements in paragraph (g) of the general section (paragraph (j) of the healthcare section). Training must include instruction on the proper and safe use of cleaning and disinfection supplies provided by the employer. For example, if an employee is tasked with cleaning their immediate work area or their tools and equipment, the employer must train the employee on which supplies to use, as well as how to properly and safely use those supplies.

Certain tasks may require employers to provide employees additional training related to cleaning and disinfection. For example, paragraph (g)(2) of the general section (paragraph (j)(2)(ii) of the healthcare section) requires employers to clean and disinfect materials, areas, and equipment that have likely been contaminated by a person who is COVID-19 positive in accordance with CDC guidance. Employers must ensure employees tasked with cleaning and disinfecting those materials, areas, and equipment receive training on the cleaning and training protocols established in accordance with the CDC guidance. Additionally, under paragraph (j)(1) of the healthcare section, in patient care areas, resident rooms, and for medical devices and equipment, employers must follow standard practices for cleaning and disinfection of surfaces and equipment in accordance with applicable CDC guidelines. Therefore, employers must train employees tasked with cleaning and disinfecting those areas surfaces in accordance with the CDC guidance. Additional information regarding cleaning and disinfection is available in the S*ummary and Explanation* for Cleaning and Disinfection.

Paragraph (k)(1)(viii) of the general section (paragraph (n)(1)(ix) of the healthcare section) requires employers to train employees on all employer-specific policies and procedures

DRAFT

for health screening and medical management. This training must cover all health screening and medical management requirements under paragraph (i) of the general section (paragraph (l) of the healthcare section), including when and how health screening will occur, what the screening will include, and how frequently employees will be screened. It is particularly important that employees are informed about the requirement that they notify their employer of COVID-19 illness or symptoms, as described in paragraph (i)(2) of the general section (paragraph (l)(2) of the healthcare section). Additionally, employees must receive training on how and when their employer will notify them of workplace exposures, as described in paragraph (i)(3) of the general section (paragraph (l)(3) of the healthcare section). Employees must be informed that these notifications will not include the name, contact information, or occupation of the employee who is COVID-19 positive. Employees must also receive training on the situations in which removal from the workplace is required and when employees who have been removed can return to work, as described in paragraphs (i)(4) and (i)(6) of the general section (paragraph (l)(4) and (l)(6) of the healthcare section). Further, training must be provided on the medical removal protection benefits required by paragraph (i)(5) of the general section (paragraph (l)(5) of the healthcare section). Additional information about employer requirements related to health screening and medical management can be found in the *Summary and Explanation* for Health Screening and Medical Management.

Paragraph (k)(1)(ix) of the general section (paragraph (n)(1)(x) of the healthcare section) requires that employers provide training on available sick leave policies, any other COVID-19-related benefits to which the employee may be entitled to under applicable federal, state, or local laws, and other supportive policies and practices. Employers must train employees on their company sick leave policies. Employers should consider implementing sick leave policies that

DRAFT

are flexible, consistent with public health guidance, and encourage potentially contagious employees to stay home. Employers must also train employees on any federal, state, or local laws under which they may be entitled to COVID-19-related benefits. Other examples of potential supportive policies and practices could include: coordinating leave policies with businesses that provide your workplace with contract or temporary employees; maintaining flexible leave policies for those caring for sick household members or with childcare responsibilities; providing telework and flexible workday options; and communicating with insurance companies to provide information to employees about medical care in the event of a COVID-19 outbreak.

OSHA believes that it is important for employees to be familiar with the ETS and have access to relevant employer-specific policies and procedures in order to comply. Thus, paragraph (k)(1)(x) of the general section (paragraph (n)(1)(xi) of the healthcare section) requires employers to identify the safety coordinator(s) specified in the COVID-19 plan as part of employees' training so they know who to contact with questions or concerns. Additionally, paragraph (k)(1)(xi) of the general section (paragraph (n)(1)(xii) of the healthcare section) requires employers to train employees on the requirements of this ETS. For example, if an employer makes the COVID-19 vaccine available to its employees, the employer must train its employees on the contents of paragraph (j) of the general section (paragraph (m) of the healthcare section) (e.g., that the employer making the vaccine available must do so at no cost to the employees). Furthermore, paragraph (k)(1)(xii) of the general section (paragraph (n)(1)(xiii) of the healthcare section) requires that employees receive training on how to obtain a copy of this ETS, as well as any relevant employer-specific policies and procedures developed under this ETS, including the employer's written COVID-19 plan, if a written plan is required.

DRAFT

Prior to the effective date of this ETS, some employers may have already provided some training to their employees in response to the ongoing COVID-19 pandemic. As explained in the note to paragraph (k)(1) of the general section (paragraph (n)(1) of the healthcare section), employers may rely on that training to the extent that it meets the relevant training requirements under paragraph (k) of the general section (paragraph (n) of the healthcare section). However, if an employer intends to rely on training already provided to satisfy its training requirements under this ETS, then it must review and evaluate the training already provided and determine whether it covers all of the training requirements under these sections. If the previous training is missing any of the required elements, then the employer must train its employees on those elements to come into compliance with the ETS. For example, if an employer has already provided recent training on the modes of transmission of COVID-19, the employer would not need to conduct that part of the training again to meet its initial training requirements under this ETS. Thus, the employer would not be required to expend resources to meet a requirement it has already met. However, the employer would need to provide training to its employees that satisfies the other requirements in paragraph (k) of the general section (paragraph (n) of the healthcare section).

Paragraph (k)(2) of the general section (paragraph (n)(2) of the healthcare section), requires employers to provide additional training when changes occur related to the employee's risk of contracting COVID-19 at work, when policies or procedures change, and when there is an indication that the employee has not retained the necessary understanding or skill. Both initial and supplemental employee training are important components of an effective approach to controlling the spread of COVID-19. Initial training, conducted before the assignment of tasks where occupational exposure may occur, provides employees with the knowledge and skills they will need to protect themselves against occupational exposure. Initial training also emphasizes

DRAFT

the importance of following workplace policies and procedures to mitigate the spread of COVID-19. Supplemental training is important to ensure employees continue to have the knowledge and skills they need to protect themselves as conditions change. Frequent review and updates to training are especially important under this ETS as more information about COVID-19, as well as updated medical recommendations and public health practices in relation to preventing COVID-19 transmission, become available.

Paragraph (k)(2)(i) of the general section (paragraph (n)(2)(i) of the healthcare section) requires additional training when changes occur that affect the employee's risk of contracting COVID-19 at work. For example, changing outbreak conditions in a community may directly affect an employee's exposure risks for contracting COVID-19, including at work. Therefore, additional training would be necessary when newly-available information from the CDC, WHO, OSHA, or local public health departments renders prior training inadequate or outdated to protect employees from COVID-19 (e.g., discovery of new modes of transmission for COVID-19). Additionally, if an employer assigns an employee new or different job tasks, that employee may be exposed to new COVID-19 hazards at work. When changes in community transmission conditions or new job tasks alter employees' exposure to COVID-19, additional training is necessary.

Paragraph (k)(2)(ii) of the general section (paragraph (n)(2)(ii) of the healthcare section) requires additional training when policies or procedures are changed. Therefore, if the employer alters its workplace policies and procedures related to COVID-19, employees must receive training on those particular changes. For example, under paragraph (c) of the general and healthcare sections, employers must monitor the workplace to ensure the ongoing effectiveness of their COVID-19 plans and update them as needed. When monitoring the workplace, the

DRAFT

employer may find that the COVID-19 plan must be updated to better address the COVID-19 transmission risks its employees are exposed to. Employees must receive training on any new or altered policies and procedures that the employer implements as a result. Such additional training ensures that employees are able to actively participate in protecting themselves from COVID-19 exposure in the workplace when policies and procedures change.

Paragraph (k)(2)(iii) of the general section (paragraph (n)(2)(iii) of the healthcare section) requires employers to provide additional training to an employee when there is an indication that the employee has not retained the necessary understanding or skill. For example, if an employer observes employees not wearing face coverings or wearing them improperly, not correctly practicing physical distancing, or not appropriately using physical barriers, the employer would have an indication that the employees have not retained their understanding of the necessary training elements. In such cases, the employer would need to provide additional training to the employees. However, where the employer discovers that the employee understands a particular workplace rule (such as wearing a facemask) but is nonetheless willfully not complying with it, retraining is not necessary if the employer takes steps to enforce the rule.

Due to the increased exposure risk to COVID-19 when providing hands on patient services and care, as well as heightened complexity of policies and procedures that healthcare and associated industries will need to put in place to comply with this standard, there are several additional provisions for training in the healthcare section. For example, paragraph (n)(1)(ii) of the healthcare section requires employers to provide training on employer-specific policies and procedures on patient screening and management. More information about employers' patient screening and management obligations can be found in the *Summary and Explanation* for Patient Screening and Management.

DRAFT

During the COVID-19 pandemic, OSHA expects that there may be a number of different multi-employer arrangements in healthcare and associated industries (e.g., contracted healthcare providers, licensed independent practitioners with privileges to practice in various workplaces). To ensure healthcare employees are adequately protected from COVID-19 exposure in multi-employer workplaces, paragraph (n)(1)(v) of the healthcare section requires employers to train employees on employer-specific multi-employer workplace agreements related to infection control policies and procedures, the use of common areas, and the use of shared equipment that affect employees at the workplace. *Common areas*, as defined in paragraph (b) of the healthcare section, are indoor or outdoor locations under the control of the employer that more than one person may use or where people congregate (e.g., building lobbies, reception areas, waiting rooms, restrooms, break rooms, eating areas, smoking areas, locker rooms, bathing areas, transit lounges, conference rooms).

Training and information requirements are routine components of OSHA standards (OSHA, 2015). The inclusion of training and information requirements reflects the agency's conviction, as noted above, that informed employees are essential to the implementation of any effective occupational safety and health policies, procedures and employer safety and health programs. OSHA believes that informing and training employees about the COVID-19 hazards to which they are potentially exposed will contribute substantially to reducing the incidence of diseases caused by workplace exposure to COVID-19.

DRAFT

**Training Summary and Explanation References:**

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Siegel JD, Rhinehart E, Jackson M, Chiarello L, and the Healthcare Infection Control Practices Advisory Committee. (2007). 2007 Guideline for Isolation Precautions: Preventing Transmission of Infectious Agents in Healthcare Settings. Centers for Disease Control and Prevention. https://www.cdc.gov/infectioncontrol/guidelines/isolation/index.html (Siegel et al., 2007)

*Anti-retaliation*

DRAFT

Paragraph (l) of the general section (paragraph (o) of the healthcare section) includes provisions to ensure employees are aware of their rights under the standard, and that they are protected from retaliation for exercising those rights. Specifically, the paragraph requires that employers inform each employee of their right to the protections required by the standard (see paragraph (l)(i) of the general section (paragraph (o)(1)(i) of the healthcare section)). Employers are also required to inform each employee of the prohibition on employers discharging or in any manner discriminating against any employee for exercising their right to the protections required by the standard, or for engaging in actions that are required by the standard (see paragraph (l)(ii) of the general section (paragraph (o)(1)(ii) of the healthcare section)). In addition, it explicitly prohibits employers from discharging or in any manner discriminating against any employee for exercising their right to the protections required by the standard, or for engaging in actions that are required by the standard (see paragraph (l)(2) of the general section (paragraph (o)(2) of the healthcare section)).

OSHA's authority to promulgate the anti-retaliation provisions of the ETS stems from section 6(c) of the Act, which requires the Agency to promulgate an ETS when necessary to protect employees from grave danger posed by a new hazard such as COVID-19. Once OSHA has established as a threshold matter, based on substantial evidence in the record, that an ETS is necessary to protect employees from COVID-19, OSHA has almost "unlimited discretion" to devise the means to achieve that goal and need only demonstrate that each specific provision of the standard is "reasonably necessary" to protect employees from exposure to COVID-19. *See United Steelworkers of Am. v. Marshall*, 647 F.2d 1189, 1230, 1237, 1241 (D.C. Cir. 1981); *see also Forging Industry Ass'n v. Sec'y of Labor*, 773 F.2d 1436, 1447 (4th Cir. 1985).

DRAFT

The anti-retaliation provisions in paragraph (l) of the general section (paragraph (o) of the healthcare section) are reasonably necessary components of the ETS because employee participation—such as wearing face coverings and staying home when they test positive for COVID-19 to protect others, maintaining social distancing, and alerting the employer to COVID-19 hazards—is critical to mitigating the spread of COVID-19 at the workplace, and fear of retaliation would undermine the effectiveness of the ETS. Although anti-retaliation protections may not be integral to all OSHA standards given the statutory bar on retaliation under section 11(c) of the OSH Act (29 U.S.C. 660(c)(1)), anti-retaliation protections are especially critical to the effectiveness of the ETS because of the emergency nature of the COVID-19 pandemic and the central role employee participation plays in effectuating the ETS's purpose.

This is not the first time OSHA has implemented explicit anti-retaliation protections in a regulation where such protections were necessary to effectuate the purposes of the OSH Act. In 2016, OSHA amended its Recordkeeping regulation to require certain employers to report data from their OSHA injury and illness records to OSHA electronically each year, and to ensure the accuracy of those records consistent with the Agency's authority under sections 8 and 24 of the Act (29 U.S.C. §§ 657 & 673), the regulation included a prohibition on retaliating against employees for reporting work-related injuries and illnesses. *See Improve Tracking of Workplace Injuries and Illnesses*, 81 Fed. Reg. 29624, 29627 (May 12, 2016); *codified at* 29 C.F.R. 1904.35. In that rulemaking, OSHA received numerous comments indicating that fear of retaliation motivated employees to conceal work-related injuries and illnesses from their employers. See 81 Fed. Reg. at 29670. Similar concerns are implicated here, where fear of retaliation could motivate employees to conceal information or refrain from taking action critical to mitigating the spread of COVID-19 in the workplace, such as reporting their COVID-19 status

DRAFT

to their employer and staying home from work after testing positive, and alerting the employer to COVID-19 hazards in the workplace. In enforcement proceedings before the Occupational Safety and Health Review Commission, two administrative law judges have upheld OSHA's authority to promulgate the anti-retaliation provision of its Recordkeeping regulation, 29 C.F.R. 1904.35(b)(1)(iv). *Sec'y of Labor v. U.S. Postal Service*, No. 18-0188, 2020 WL 4514847, at *14-17 (May 18, 2020), *set aside on other grounds*, 2020 WL 4514846 (July 28, 2020) (holding that the regulation was validly promulgated and citing an order of another ALJ reaching the same conclusion). A facial challenge to the validity of the Recordkeeping rule's anti-retaliation provision is pending in the U.S. District Court for the Western District of Oklahoma. *See Nat'l Ass'n of Home Builders v. Acosta*, CIV-19-009-PRW (W.D. Okla., Jan. 4, 2017).

The anti-retaliation provisions of the ETS partially overlap with statutory retaliation bar in section 11(c)(1) of the OSH Act, 29 U.S.C. 660(c)(1), which provides:

> No person shall discharge or in any manner discriminate against any employee because such employee has filed any complaint or instituted or caused to be instituted any proceeding under or related to [the OSH Act or has testified or is about to testify in any such proceedings or because of the exercise by such employee on behalf of himself or others of any right afforded by [the] Act.

But the fact that the anti-retaliation provisions in the ETS dovetail with the anti-retaliation goals of section 11(c) does not limit OSHA's authority to promulgate them. *See United Steelworkers, AFL-CIO v. St. Joe Resources*, 916 F.2d 294, 296-98 (5th Cir. 1990) (holding that section 11(c) is not an exclusive remedy, and OSHA had the authority to order back pay to remedy a violation of OSHA's Lead standard even where section 11(c) would require the same relief). And, to the extent the OSH Act may not unambiguously resolve this question, OSHA's interpretation of section 6(c) as authorizing the Agency to promulgate the anti-retaliation requirements in this ETS is entitled to deference under *Chevron USA, Inc. v. NRDC*, 467 U.S. 837 (1984). *See*

DRAFT

*Mourning v. Family Publication Serv., Inc.*, 411 U.S. 356, 369 (1973) (upholding agency's authority to promulgate regulations "reasonably related to the purposes of the enabling legislation"); *Pub. Citizen Health Rsch. Grp. v. U.S. Dep't of Lab.*, 557 F.3d 165, 178 (3d Cir. 2009), *as amended* (May 15, 2009) (affording *Chevron* deference to OSHA's "choice of methodology to implement the [OSH Act]").

The anti-retaliation provisions of this ETS are necessary to protect employees from the grave danger posed by COVID-19 because it is critically important for employees to be aware of, and to be able to exercise, their rights under the standard given that employee participation is essential to mitigating the spread of COVID-19 in the workplace. For example, employees who are COVID-19 positive must be able to notify their employer of their condition without fear of retaliation in order to protect others in the workplace; if an employee refrains from reporting their condition to the employer due to fear of retaliation, the employee would not be removed from the workplace and could spread the infection to other employees. Similarly, employees must be able to notify their employer of other COVID-19 hazards in the workplace—such as co-workers or members of the public refusing to wear face coverings or wearing them improperly—without fear of retaliation; if an employee does not report a hazardous condition due to fear of retaliation, the employer may not become aware of the hazard and would not be able to address it. A workplace free from the threat of retaliation promotes collaboration between employers and employees in the effort to minimize the risk of transmission of COVID-19.

As of February 21, 2021, the Agency had received 4,872 complaints alleging retaliation for activities related to workplace protections from COVID-19, which represents a significant increase in the number of complaints OSHA would typically receive in the same time period—OSHA received a total of 13,507 retaliation complaints from February 1, 2020 to February 21,

DRAFT

2021 (including the 4,872 COVID-19-related complaints), compared to 9,819 total complaints during the same timeframe in 2019-20, and 9,832 total complaints during the same timeframe in 2018-19. Approximately 35 percent of the docketed COVID-19-related complaints OSHA has completed investigating have resulted in merit findings or settlements involving positive outcomes for complainants. Some examples of complaints OSHA has received include the following:

- An employee was fired for complaining that customers and co-workers were not wearing their face coverings properly.
- A manager encouraged his staff to stay home and get tested after an outbreak at work; the employer did the opposite and offered bonuses and extra pay to employees who came to work, then retaliated against the manager because he had encouraged employees to stay home and get tested.
- A doctor was fired because she distributed face coverings at the clinic and instructed employees, including those working the front desk, to wear face coverings and take precautions.
- An employee at a healthcare clinic was disciplined because he wanted to wear an N95 respirator. The employer provided surgical masks but refused to allow the employee to wear an N95 respirator, even if he provided his own.
- An employee was disciplined because she raised concerns about a co-worker who was allowed to come to work while awaiting the outcome of a COVID-19 test.
- An employee was symptomatic at work and was sent home by his employer. He was instructed by the employer to stay home until he received COVID-19 test results. His test

DRAFT

results were negative, but upon return to work he was notified that he was terminated due to his absence during the period when he was awaiting test results.

Each of the situations described above, if verified, would be considered a violation of the standard. Retaliation takes many forms; it occurs when an employer (through a manager, supervisor, or administrator) fires an employee or takes any other type of adverse action against an employee for engaging in protected activity. Adverse actions include discipline; reducing pay or hours; reassignment to a less desirable position; denying overtime or promotion; intimidation or harassment; and any other action that would dissuade a reasonable employee from raising a concern about a possible violation or engaging in other protected activity. *See Burlington Northern & Santa Fe Railway Co. v. White*, 548 U.S. 53, 57 (2006) (holding, in the Title VII context, that the test for determining whether a particular action is materially adverse is whether it "could well dissuade" a reasonable person from engaging in protected activity).

Although the ETS does not change the substantive obligations of employers to refrain from retaliating against employees for engaging in protected activity under section 11(c), the anti-retaliation provisions in the ETS serve two additional purposes. First, they increase awareness of the protections provided to employees. Second, they provide OSHA with an enhanced enforcement tool for ensuring that employees are protected from retaliation for exercising their right to the protections required by the ETS, and for engaging in actions required by the ETS. In other words, the anti-retaliation provisions of the standard serve a preventive purpose as well as a remedial one. "The breadth of agency discretion is, if anything, at zenith when the action assailed relates primarily not to the issue of ascertaining whether conduct violates the statute, or regulations, but rather to the fashioning of policies, remedies and

DRAFT

sanctions, . . . in order to arrive at maximum effectuation of Congressional objectives." *United Steelworkers*, 647 F.2d at 1230 n.64 (citation omitted).

Regarding the standard's preventive purposes, the requirement for employers to inform each employee of their rights under the standard and the prohibition on retaliation serves to educate employees who might not otherwise be aware of their rights. The explicit prohibition on retaliation reminds employers of their obligation not to discharge or discriminate against employees for exercising their right to the protections required by the ETS, or for engaging in actions required by the ETS. The standard thus serves to enhance protections against retaliation by increasing awareness of those protections among both employees and employers. By increasing awareness, OSHA believes that the provisions will prevent acts of retaliation from occurring in the workplace and encourage employees to exercise their right to the protections required by the ETS, to engage in actions required by the ETS, and to communicate their COVID-19 status to the employer to mitigate the spread of COVID-19 in the workplace.

Employers have flexibility regarding how they will inform employees of their rights and the prohibition on retaliation. This information can be provided along with other training required under the standard, or it can be provided separately. Employees can be informed in writing, verbally during a staff meeting, or using other methods. Employers are able to choose any method of informing employees, so long as each employee is apprised of the information specified in the standard.

Regarding the standard's remedial purposes, the prohibition on retaliation in the standard provides OSHA with a means of addressing workplace retaliation that is vitally important for protecting employees from the grave danger presented by COVID-19 in the workplace. Under section 11(c), an employee who believes he or she has been retaliated against may file a

DRAFT

complaint with OSHA, and if, after investigation, the Secretary has reasonable cause to believe that section 11(c) has been violated, then the Secretary may file a complaint against the employer in U.S. District Court seeking "all appropriate relief," including reinstatement and back pay (29 U.S.C. 660(c)(2)). However, section 11(c) only authorizes the Secretary to take action against an employer for retaliating against an employee if the employee files a complaint with OSHA within 30 days of the retaliation (29 U.S.C. 660(c)). The ETS provides OSHA with an additional enforcement tool for promoting employee engagement in mitigating the spread of COVID-19 in the workplace, which is critical given the grave and unusual danger COVID-19 poses to workers. Some employees may not have the time or knowledge necessary to file a section 11(c) complaint or may fear additional retaliation from their employer if they file a complaint. The standard allows OSHA to issue citations to employers for retaliating against employees, and require abatement including back pay and reinstatement, even if no employee has filed a section 11(c) complaint within 30 days of the retaliation. OSHA has six months from the occurrence of a violation to issue a citation under the standard (29 U.S.C. 658(c)).

In addition, OSHA can address retaliation directly and relatively quickly by issuing a citation, whereas litigation in U.S. District Court under section 11(c) is a much slower process. Moreover, OSHA can issue a single citation addressing retaliation against multiple employees—for example, if OSHA discovers during an inspection that the employer terminated multiple employees who tested positive for COVID-19, or multiple employees who wore their own N95 respirators or face coverings—without identifying which employee(s), if any, filed a complaint with OSHA. In contrast, complaints under section 11(c) must identify each individual complainant. With cases related to COVID-19, it is critically important for OSHA to be able to act as quickly and efficiently as possible to ensure that employees are provided the protections

DRAFT

required by the standard, and are taking the precautions required to protect each other from COVID-19, without fear of retaliation. Any delay in addressing retaliation in these circumstances could result in additional cases of COVID-19 in the workplace, for example if employees hide their COVID-19 status or refrain from taking precautions required to protect themselves and other employees from COVID-19 because they fear retaliation from the employer.

The standard does not abrogate or interfere with the rights or restrictions contained in section 11(c) of the OSH Act. An employee who wishes to file a complaint under section 11(c) may do so within the statutory 30-day period regardless of whether OSHA is investigating an alleged violation of the standard involving the same underlying conduct. Where OSHA's investigation substantiates the violation, OSHA will determine (in consultation with the complainant, where appropriate) whether to pursue a remedy under section 11(c) or through a citation under the ETS, but not both. A Note to paragraph (l) of the general section (paragraph (o) of the healthcare section) is included in the regulatory text to provide an additional reminder of the protections from retaliation provided under section 11(c).

DRAFT

**Anti-retaliation Summary and Explanation References:**

Occupational Safety and Health Administration (OSHA). (2021, February 22). COVID-19 Response Summary: Summary Data for Federal Programs – Whistleblower Data. https://www.whistleblowers.gov/covid-19-data (OSHA, February 22, 2021)

*Requirements implemented at no cost to employees*

Paragraph (m) of the general section (paragraph (p) of the healthcare section) specifies that the implementation of all requirements of the standard, with the exception of any employee self-monitoring conducted under paragraph (i)(1)(i) of the general section (paragraph (l)(1)(i) of the healthcare section), must be at no cost to employees. This provision is included to make it clear that the employer is responsible for costs associated with implementation of the standard.

The requirement is consistent with the OSH Act, which requires employers to ensure a safe and healthful work environment. It is also consistent with OSHA's past practice in numerous rulemakings. In indicating that the implementation of all requirements must be at no cost to the employee, OSHA considers costs to include not only direct monetary expenses to the employee, but also the time necessary to perform required tasks and other expenses such as transportation costs.

It is vitally important that the protections of the ETS are provided at no cost to employees. For example, OSHA concluded in the agency's final rule on Employer Payment for Personal Protective Equipment (PPE) that requiring employers to pay for PPE results in significant safety benefits because employees are more inclined to use PPE if it is provided to them at no cost (72 FR 64341, 64344). As described in *Need for Specific Provisions* (Section V of this preamble), face coverings, facemasks, and face shields are critical to minimizing the risk of COVID-19 transmission in the workplace. Employer payment for these items therefore serves to enhance the protection of employees from COVID-19 hazards. Similarly, employees are more likely to take advantage of other workplace protections if they are provided at no cost. For example, in one instance where employees were transported to and from a hospital at company expense for a work-related medical exam, and they received their normal pay during transportation, waiting, and examination time, employee participation was 100%. When subsequent examinations were scheduled outside working hours and employees were not provided with transportation or compensated for their time, participation dropped to 58%. *See Phelps Dodge Corp. v. OSHRC*, 725 F.2d 1237, 1238 (9th Cir. 1984).

The requirement that protections under the standard be provided at no cost to employees applies broadly to the provisions of the standard. For example, face coverings must be provided

DRAFT

at no cost to employees to meet the requirements of paragraph (f) of the general section.[27] Paragraph (f)(2) of the general section provides an exception to this requirement when employees provide their own face coverings. When employees choose to use their own face coverings, the employer is not required to reimburse them for the cost of those face coverings. Similarly, when face shields are required to comply with the standard, they must be provided at no cost to employees. Paragraph (f)(4) of the general section provides an exception to this requirement when employees choose to provide their own face shields. When the employer allows employees to use their own face shields, the employer is not required to reimburse them for the cost of those face shields.

Paragraph (f) of the healthcare section also includes requirements for facemasks, face shields, and in some circumstances, respirators and other PPE. These items must be provided at no cost to employees. Paragraph (f)(1)(iii) of the healthcare section also provides an exception to this requirement for employees who provide their own face shields. As under the general section, when the employer allows employees to use their own face shields, the employer is not required to reimburse the employees for the cost of those face shields.

In addition, the standard permits employers to allow employees to provide and use their own PPE in some circumstances where PPE is not required, or where PPE provided by the employee would be more protective than what is required under the standard. Specifically, paragraph (f)(5) in the general section allows the employer to permit an employee to wear their

DRAFT

[27] This Summary and Explanation of paragraph (m) of the general section (paragraph (p) of the healthcare section) highlights *some* of the requirements that must be implemented at no cost to employees. This discussion is intended to be illustrative of the requirement that, with limited exceptions, employees are not to bear the costs of implementing the general and healthcare sections; it is not intended to be an exclusive list of the sections' no cost requirements. As stated in paragraph (m) of the general section (paragraph (p) of the healthcare section), the implementation of *all* requirements of the general and healthcare sections, with the exception of any employee self-monitoring conducted under paragraph (i)(1)(i) of the general section (paragraph (l)(1)(i) of the healthcare section), must be at no cost to employees.

own respirator instead of a required face covering; paragraph (f)(6) in the general section requires the employer to allow an employee to wear their own face covering, facemask, and/or face shield when these items are not required, unless doing so would create a hazard of serious injury or death; and paragraph (f)(4)(ii) in the healthcare section requires the employer to permit an employee to wear their own respirator instead of a required facemask. In each of these circumstances, when an employee provides and uses their own PPE, the employer is not obligated to pay the employee for the cost of procuring or maintaining the PPE.

Where an employee elects to provide their own PPE, OSHA believes it is reasonable for the employee to assume responsibility for the cost of that PPE. These are situations where either no PPE is required, or where the employee chooses to use an alternative to what is required under the standard. The employer must provide the protections required by the standard at no cost to employees, but is not obligated to pay for protections beyond those required, or for alternatives chosen by the employee.

Paragraph (i)(1)(i) of the general section (paragraph (l)(1)(i) of the healthcare section) requires the employer to screen each employee before each work day and each shift for COVID-19 symptoms. The provision allows for employee self-monitoring as well as screening in person by the employer. Where employers elect to conduct screening by having employees self-monitor before reporting to work, the standard does not require them to compensate employees for any incidental costs they incur (e.g., the cost of a thermometer to measure their temperature).

Paragraph (i)(1)(ii) of the general section (paragraph (l)(1)(ii) of the healthcare section) explicitly indicates that any COVID-19 test required by the employer for screening purposes must be provided at no cost to the employee. Similarly, any COVID-19 test provided under

DRAFT

paragraph (i)(4)(ii)(B) of the general section (paragraph (l)(4)(ii)(B) of the healthcare section) must be provided free of cost to the employee. If testing under any of these provisions requires travel by the employee, the employer is required to bear the cost of travel (e.g., mileage for personal vehicle use, public transportation fare), and the employee must be paid at their regular rate of pay for time spent receiving the test, including travel time.

Paragraph (j) of the general section (paragraph (m) of the healthcare section) requires that, when an employer makes a vaccine available to its employees either at the workplace or off-site, the vaccine must be provided at no cost to the employee. If vaccination requires travel by the employee, the employer is required to bear the cost of travel. The employee must be paid for time spent receiving the vaccination, including any time spent on required paperwork, vaccine administration, post-vaccination monitoring, and travel time. The employer also must ensure that the employee is not charged any fees for administration of the vaccine.

Paragraph (k) of the general section (paragraph (n) of the healthcare section) requires the employer to ensure that each employee receives training, in a language and at a literacy level the employee understands, so that the employee comprehends specified elements regarding COVID-19, associated hazards in the workplace, the measures in place to protect employees from those hazards, and other specified topics. This training must be provided at no cost to the employee. The employee must be paid for time spent receiving training. If an employee must travel away from the workplace to receive training, the employer is required to bear the cost of travel, and the employee must be paid for travel time. Any training or other communications provided under paragraph (l)(1) of the general section (paragraph (o)(1) of the healthcare section), which requires employers to inform each of their employees about certain anti-retaliation-related topics, must similarly be provided at no cost to employees.

DRAFT

*Recordkeeping*

Section 8(c)(1) of the Act requires employers to "make, keep and preserve, and make available to the Secretary [of Labor] or the Secretary of Health and Human Services, such records regarding his activities relating to this Act as the Secretary, in cooperation with the Secretary of Health and Human Services, may prescribe by regulation as necessary or appropriate for the enforcement of this Act or for developing information regarding the causes and prevention of occupational accidents and illnesses." Section 8(c)(2) of the Act specifically directs the Secretary of Labor to promulgate regulations requiring employers to maintain accurate records of work-related injuries and illnesses. Section 8(c)(3) of the Act requires employers to "maintain accurate records of employee exposures to potentially toxic materials or harmful physical agents which are required to be monitored or measured under section 6 [of the Act.]" In accordance with section 8(c), OSHA has included recordkeeping requirements in paragraph (n) of the general section and paragraph (q) of the healthcare section. These paragraphs include requirements for the creation, maintenance, and availability of certain COVID-19-related records, including the retention of the COVID-19 plan required by paragraph (c) of each of these sections, the establishment and maintenance of a COVID-19 log, as well as the availability of records to employees, employee representatives, and OSHA.

Although the Act provides OSHA with authority to require all employers covered by OSHA to keep records, one major class of employers is not required to keep records under paragraphs (n) and (q) of the general and healthcare sections, respectively. Paragraph (n)(1) of the general section (paragraph (q)(1) of the healthcare section) provides that small employers with 10 or fewer employees on the effective date of the applicable section are not required to comply with the recordkeeping provisions in paragraph (n)(2) or (n)(3) of the general section

DRAFT

(paragraph (q)(2) or (q)(3) of the healthcare section). The approach to the scope in each section is generally consistent with the partial exemption in 29 CFR 1904.1, which provides that an employer in any industry with 10 or fewer employees at all times during the last calendar year is not required to maintain OSHA records of occupational injuries and illnesses during the current year unless required to do so in writing by OSHA.

The size exemption in paragraph (n)(1) of the general section (paragraph (q)(1) of the healthcare section) is based on the total number of employees in a firm, rather than the number of employees at a particular location or establishment. An exemption based on individual establishments would be difficult to administer, especially in cases where an individual employee, such as a maintenance worker, regularly reports to work at several establishments. Under the 10-or-fewer employee exception in this paragraph, approximately 80% of employers under OSHA's authority would not be required to maintain records required under paragraph (n)(2) of the general section (paragraph (q)(2) in the healthcare section) or make such records available under paragraph (n)(3) of the general section (paragraph (q)(3) in the healthcare section).

All individuals who are "employees" under the OSH Act are counted in the total; the count includes all full-time, part-time, temporary, and seasonal employees. For businesses that are sole proprietorships or partnerships, the owners and partners would not be considered employees and would not be counted. Other examples of individuals who are not considered to be employees under the OSH Act are unpaid volunteers and immediate family members of farm employers (see 29 CFR 1975.4(b)(2), and 66 Fed. Reg. 5916, 6038).

Additionally, OSHA's regulation at 29 CFR 1904.2 partially exempts certain lower-hazard industry groups from the requirement for keeping occupational injury and illness records.

DRAFT

However, the partial exemption in 29 CFR 1904.2 does not apply to the recordkeeping requirements in paragraph (n) of the general section or (q) of the healthcare section. Employers in all industries, even those that are partially-exempt under OSHA's recordkeeping regulation, must comply with the recordkeeping requirements in this paragraph if they have more than 10 employees on the effective date of the applicable section. Also, although exempted from maintaining records under paragraph (n) of the general section (paragraph (q) of the healthcare section), employers with 10 or fewer employees are required to report to OSHA each work-related COVID-19 fatality and in-patient hospitalization as required by paragraph (o) of the general section (paragraph (r) of the healthcare section).

Paragraph (n)(2)(i) of the general section (paragraph (q)(2)(i) for healthcare) provides that covered employers must retain all versions of the COVID-19 plan implemented to comply with this section while this section remains in effect. As discussed above, paragraph (c) of both the general and healthcare sections requires employers with more than 10 employees to develop, implement, and update a written COVID-19 plan for each workplace. Since paragraph (c) of these sections requires employers to update their written COVID-19 plan as needed, paragraph (n)(2)(i) of the general section (paragraph (q)(2)(i) of the healthcare section) requires employers to retain all versions of the plan while this section is in effect.

One of the main purposes for the retention requirement is to provide employees, former employees, and their representatives with access to the written plan. As discussed below, paragraph (n)(3)(i) of the general section (paragraph (q)(3)(i) of the healthcare section) requires employers to provide access to employees and employee representatives to all versions of the

DRAFT

written COVID-19 plan.[28] OSHA believes that access to the plan will not only inform employees about the contents of the document, but will also lead to increased employee involvement in the development and updating of the plan. In addition, OSHA believes retention of all versions of the plan will ultimately assist employers in the prevention of COVID-19 exposure in their workplaces. Retention of all versions of the plan will enable employers to better evaluate the effectiveness of policies and procedures they have taken to limit exposure to COVID-19 and will ensure that employees and their representatives can provide meaningful contributions to the review and improvement of the COVID-19 plan. Additionally, making all versions of the plan available to OSHA (as required by paragraph (n)(3)(iv) of the general section (paragraph (q)(3)(iv) of the healthcare section)) will allow the agency to verify the effectiveness of employee protections.

Under paragraph (n)(2)(ii) of the general section (paragraph (q)(2)(ii) of the healthcare section), employers with more than 10 employees on the effective date of the applicable section are required to establish and maintain a COVID-19 log and record each instance identified by the employer in which an employee is "COVID-19 positive," meaning that person has tested positive for, or has been diagnosed by a licensed healthcare provider with, COVID-19, *regardless of whether the instance is connected to exposure to COVID-19 at work*. However, the COVID log should not record incidences for employees who work exclusively from home and thus could not expose others in the workplace. As explained in a Note to paragraph (n)(2)(ii) of the general

DRAFT

[28] Consistent with 29 CFR 1904.35(a)(3), OSHA interprets the term "employee" as used in paragraph (n)(3)(i)-(iii) of the general section (paragraph (q)(3)(i)-(iii) of the healthcare section) to include former employees. In accordance with this interpretation, OSHA also interprets the phrases "their personal representatives" and "their authorized representatives," as used in paragraph (n)(3)(i) and (n)(3)(iii) of the general section (paragraph (q)(3)(i) and (q)(3)(iii) of the healthcare section), to include the personal and authorized representatives of former employees. These interpretations are limited to these provisions. Note, as discussed in more detail below, that for former employees and their representatives, the requirement to provide access to the written COVID-19 plan under paragraph (n)(3)(i) of the general section (paragraph (q)(3)(i) of the healthcare section) is limited to the versions of the plan that were implemented during the former employees' employment.

section (paragraph (q)(2)(ii) of the healthcare section), the COVID-19 log is intended to assist employers with tracking and evaluating instances of employees who are COVID-19 positive without regard to whether those employees were infected at work. While the workplace is immediately impacted by having a COVID-19 positive employee because of the potential exposure to others, it can often be difficult to determine quickly whether that employee was infected at work or elsewhere, so OSHA has relieved employers of the burden of trying to make that determination for the COVID-19 log. Because of the need to quickly identify and track potential workplace exposure trends and inform others in the workplace about potential exposures, as well as implement other requirements of the standard (i.e., medical removal from the workplace), it is more urgent to record an instance where an employee is COVID-19 positive and the details surrounding that instance than to wait to determine whether the instance was work-related. OSHA believes that the requirement to establish and maintain a COVID-19 log will ultimately assist employers in preventing workplace transmission, even when cases arise that do not originate in the work environment.

Paragraph (n)(2)(ii)(A) of the general section (paragraph (q)(2)(ii)(A) in the healthcare section) provides that the COVID-19 log must contain, for each instance, the employee's name, contact information, occupation, location where the employee worked, the date of the employee's last day at the workplace, the date of the positive test for, or diagnosis of, COVID-19, and the date the employee first had one or more COVID-19 symptoms, if any were experienced.

The main purpose of the COVID-19 log is to assist employers in tracking whether there is a COVID-19 outbreak at the worksite. Information about specific occupations and locations where employees have worked can be used to pinpoint where exposure has occurred. For

DRAFT

example, if the establishment is an office building and the occupation of the infected employee is "waste collector" and the location is "floors 3 through 6," the employer would be able to conclude that the employee had spent a short duration in nearly every room on those floors and may be able to determine what times exposures in each place would have occurred based on the normal trash pickup schedule. If the employee's occupation is "delivery person," the employer may be required to notify other employers along that employee's delivery route, or state contact tracers.

Also, entering information on the COVID-19 log about an employee with non-work-related COVID-19 illness assists an employer in tracking how and when the disease entered the workplace. By entering information about all employee cases of COVID-19, the time needed by employers to make work-relatedness determinations is eliminated, and thus results in information being entered on the COVID-19 log in a timely manner. In addition, the information entered on the log may assist an employer in determining whether the employer's policies and procedures have been effective in the prevention of COVID-19 in their workplace.

Additionally, paragraph (n)(2)(ii)(B) of the general section (paragraph (q)(2)(ii)(B) of the healthcare section) requires employers to make entries on the COVID-19 log within 24 hours of learning that an employee is COVID-19 positive. The 24-hour timeframe ensures that information about an employee's confirmed or diagnosed illness is timely entered on the COVID-19 log. At some worksites, timely information entered on the COVID-19 log may assist employees and their representatives, who have a right of access to certain information on the log, in preventing the spread of the disease throughout a facility. Specifically, the timely entry of COVID-19 illness information on the log may assist employee representatives in identifying exposure trends in different areas of a workplace.

DRAFT

The COVID-19 log required by the ETS differs from the OSHA 300 log that employers are required to maintain under the OSHA injury and illness recordkeeping regulation at 29 CFR 1904. Most importantly, under 29 CFR 1904, employers are required to make several determinations regarding the recordability of specific injuries and illnesses before information is entered on the 300 log. For example, employers must determine whether an employee's COVID-19 illness is work-related. Under paragraph (n)(2)(ii) of the general section (paragraph (q)(2)(ii) of the healthcare section), employers are required to enter information on the COVID-19 log regardless of whether an employee's illness is the result of a work-related exposure. Also, under 29 CFR 1904, employers must generally provide access to the 300 log to employees, former employees, and their representatives with the names of injured or ill employees included on the form. By contrast, employers must maintain the COVID-19 log as though it is a confidential medical record, except when providing access as required by paragraph (n)(3) of the general section or paragraph (q)(3) of the healthcare section, or other federal law. As a result, while some COVID-19 illnesses may qualify for entry on both logs, the OSHA 300 log may not be used as a substitute for the COVID-19 log required by this section.

Finally, as explained in a Note to paragraph (n) of the general section (paragraph (q) of the healthcare section), employers must continue to record all work-related confirmed cases of COVID-19 on their OSHA Forms 300, 300A, and 301, or on equivalent forms, if required to do so under 29 CFR Part 1904. The recordkeeping regulation at 29 CFR 1904 includes additional requirements for the recording of work-related COVID-19 illness from this ETS. Under 29 CFR 1904, COVID-19 is a recordable illness and employers are responsible for recording cases of COVID-19 if: (1) the case is a confirmed case of COVID-19 as defined by the Centers for Disease Control and Prevention (CDC); (2) the case is work-related as defined by 29 CFR

DRAFT

1904.5; and (3) the case involves one or more of the general recording criteria in set forth in 29 CFR 1904.7 (e.g., medical treatment beyond first aid, days away from work).

Paragraph (n)(2)(ii)(B) of the general section (paragraph (q)(2)(ii)(B) of the healthcare section) also requires that the information in the COVID-19 log be maintained in a manner consistent with federal and state confidentiality and privacy requirements. OSHA historically has recognized that occupational safety and health records maintained by employers may contain information of a sufficiently intimate and personal nature that a reasonable person would wish to remain confidential. While the entries of information on the COVID-19 log may be brief, they may contain information that could result in a serious confidentiality or privacy concern if disclosed to other employees, former employees, or their representatives. Accordingly, under these sections, the disclosure of personal information entered on the COVID-19 log is limited to the access provisions set forth in paragraph (n)(3) of the general section (paragraph (q)(3) of the healthcare section). Otherwise, employers must maintain the log in a private and confidential manner.[29] In addition, employers must follow applicable federal and state privacy requirements when maintaining the information entered on the COVID-19 log.

One of the major federal laws addressing the privacy of individuals' health information is the U.S. Department of Health and Human Services (HHS) regulation at 45 CFR 160 and 164, known as the Health Insurance Portability and Accountability Act of 1996 (HIPAA) "Privacy Rule." The Privacy Rule protects the privacy of individually identifiable health information maintained or transmitted by HIPAA covered entities[30] and their business associates (referred to

DRAFT

[29] Please note that the employer is still required to enter work-related COVID-19 cases on the 300 log pursuant to 29 CFR part 1904 and must provide access to them under 29 CFR 1904.35(b)(2)(iv). However, employees do have the right to ask employers to record their injury or illness on the 300 log as a "privacy concern case," which could allow the employer to restrict the employee's name (see 29 CFR 1904.29(b)(6)-(9)).

[30] "Covered entities" are health plans, health care clearinghouses, and health care providers who conduct certain standard transactions electronically (see 45 CFR 160.103).

as "protected health information" or "PHI"). The Privacy Rule is also balanced to ensure that appropriate uses and disclosures of PHI can be made when necessary to treat a patient, to protect the nation's public health, and for other important purposes. A covered entity may not use or disclose PHI except as permitted or required by the Privacy Rule (see 45 CFR 164.502).

The term "covered entity" includes health plans, health care clearing houses, and health care providers who transmit health information in electronic form. For OSHA purposes, this mainly refers to a health care provider, defined in the Privacy Rule as any person or organization that furnishes, bills, or is paid for health care in the normal course of business.

The HIPAA Privacy Rule excludes certain individually identifiable health information from the definition of PHI. For example, employment records held by a covered entity in its role as an employer are not PHI and the HIPAA Privacy Rule would not affect the disclosure of health information contained in employment records to OSHA (see 45 CFR 160.103).

With respect to disclosures of PHI made by covered entities directly to OSHA, the Agency notes that the Privacy Rule specifically permits disclosures of PHI without an individual's authorization for certain purposes. Of particular significance is 45 CFR 164.512, "Uses and disclosures for which authorization or opportunity to agree or object is not required." These standards do not compel a covered entity to disclose PHI. Instead, they permit the covered entity to make the requested disclosure without obtaining authorization from the individuals who are the subjects of the PHI. Section 164.512(a) of the Privacy Rule permits covered entities to use and disclose PHI, without an individual's authorization, when they are required to do so by another law. HHS has made clear that this provision encompasses an array of binding legal authorities, including statutes, agency orders, regulations, or other federal, state, or local governmental actions having the effect of law (see 65 FR 82668). As a result, the Privacy Rule,

DRAFT

in and of itself, generally does not provide a justification for a covered entity to refuse to disclose PHI to OSHA as required by an OSHA standard or regulation.

A covered entity may also disclose PHI without an individual's authorization to "public health authorities" and to "health oversight agencies" (see 45 CFR 164.512(b) and (d)). The preamble to the Privacy Rule issued in 2000 specifically mentions OSHA as an example of both (see 65 FR 82492, 82526). Accordingly, while employers must maintain the COVID-19 log in a manner consistent with federal and state privacy requirements, they generally may not refuse to disclose PHI when required or requested by OSHA based solely on the provisions of the Privacy Rule. Also, because paragraph (n)(3) of the general section (paragraph (q)(3) of the healthcare section), includes a specific, legally enforceable right of access, the Privacy Rule permits employers to disclose certain PHI to employees, former employees, and their representatives, to the extent the disclosure is "required by law" (and must do so as required by the ETS).

Paragraph (n)(2)(ii)(C) of the general section (paragraph (q)(2)(ii)(C) for healthcare) provides that the COVID-19 log must be maintained and preserved while this section remains in effect. The purpose of this retention requirement is twofold. First, retention of the log allows employers to review previously entered information over a long period of time. This can be useful to determine which policies and procedures at a workplace have been effective in reducing occupational exposure to COVID-19. Second, retention of the log allows for access of the entered information by employees, former employees, and their representatives, and OSHA, which can facilitate tracing of potential exposures at a particular worksite and at other worksites where infected employees may have traveled.

The maintenance requirement in paragraph (n)(2)(ii)(C) of the general section (paragraph (q)(2)(ii)(C) of the healthcare section) does not specify a particular method by which employers

DRAFT

must maintain the log. Employers have flexibility in choosing a method for maintaining the information on the log. In making these decisions, employers should consider using a method that gives them the ability to effectively enter, update, and retain the information on the log while this section remains in effect, and ensures that the entered information is both accurate and secured. Also, employers should use a method that can allow for transmission of data when employees, former employees, and their representatives, and OSHA, request access to information under paragraph (n)(3) of the general section (paragraph (q)(3) of the healthcare section), especially when information is maintained at a centralized location.

For purposes of centralized recordkeeping, the COVID-19 log may be maintained at a location other than the establishment, such as a company's central office. Employers with several distinct establishments or workplaces may keep several versions of the log at a centralized location. However, if the COVID-19 log(s) is maintained at a central location, the employer must ensure that the information on the log can be accessed by employees, employee representatives, and OSHA at the relevant worksite in accordance with the requirements of section of the ETS.

Finally, if a business changes ownership while the ETS is in effect, the selling employer is responsible for transferring information on the COVID-19 log to the new owner. Under these circumstances, the previous owner is responsible for transferring all of the information entered on the COVID-19 log to the new owner, and the new employer becomes responsible for retaining that COVID-19 log. This will help ensure that the new employer is aware of previously entered COVID-19 exposure information, and that employees and their representatives who remain after the sale, as well as former employees and their representatives,

DRAFT

will have continued access to all of the COVID-19 log information at their workplace or former workplace.

Paragraph (n)(3) of the general section (paragraph (q)(3) of the healthcare section) includes requirements for the access, upon request, by employees, former employees, and their representatives to records retained or maintained by employers under paragraph (n) of the general section (paragraph (q) of the healthcare section). In addition, paragraph (n)(3) of the general section (paragraph (q)(3) of the healthcare section) includes requirements for records access for the Assistant Secretary. One of the goals of these access requirements is to enhance employee involvement in the process for preventing COVID-19 exposure in the workplace. OSHA believes employee access to information about COVID-19 is an essential part of an effective COVID-19 plan. When employees do not have access to accurate information about hazards they face in their workplace, the likelihood increases that employees may suffer occupational injuries and illnesses. This would mean, for purposes of COVID-19, that employers and employees would not have information they need to prevent the outbreak and spread of the virus in their workplace.

Paragraph (n)(3) of the general section (paragraph (q)(3) of the healthcare section) specifies that the employer must provide the records specified in paragraph (n)(3)(i)-(iv) of the general section (paragraph (q)(3)(i)-(iv) of the healthcare section) to the specified individuals for examination and copying within one business day of a request. By requiring prompt production of these records, these provisions ensure that requesters, who are limited to employees and their representatives, can have the information necessary to take an active role in their employers' efforts to prevent COVID-19 exposure in the workplace.

DRAFT

Paragraph (n)(3)(i)-(iv) of the general section (paragraph (q)(3)(i)-(iv) of the healthcare section) provides more details about which records the employers must provide access to and to whom that access must be provided. Paragraph (n)(3)(i)-(iii) of the general section (paragraph (q)(3)(i)-(iii) of the healthcare section) focuses on records access for employees and their representatives. As noted above, and consistent with 29 CFR 1904.35(a)(3), OSHA interprets the term "employee" as used in paragraph (n)(3)(i)-(iii) of the general section (paragraph (q)(3)(i)-(iii) of the healthcare section) to include former employees. In accordance with this interpretation, OSHA also interprets the phrases "their personal representatives" and "their authorized representatives," as used in paragraph (n)(3)(i) and (n)(3)(iii) of the general section (paragraph (q)(3)(i) and (q)(3)(iii) of the healthcare section), to include the personal and authorized representatives of former employees. These interpretations are limited to these provisions.

In addition, for purposes of paragraph (n)(3) of the general section and paragraph (q)(3) of the healthcare section, the term "representative" is intended to have the same meanings as in 29 CFR 1904.35(b)(2), which encompasses two types of employee representatives. The first is a personal representative of the employee or former employee, who is a person the employee or former employee designates, in writing, as his or her personal representative, or is a legal representative of a diseased or legally incapacitated employee or former employee. The second is an authorized representative, which is defined as an authorized collective bargaining agent of one or more employees working at the employer's worksite. Authorized representatives do not require separate written authorization to access the version of the COVID-19 log that maintains employee privacy because they have received broad authorization (see below for more details regarding the version of the log that maintains employee privacy).

DRAFT

Under paragraph (n)(3)(i)-(iii) of the general section (paragraph (q)(3)(i)-(iii) of the healthcare section), employees, former employees, and their representatives have three specific access rights. First, pursuant to paragraph (n)(3)(i) of the general section (paragraph (q)(3)(i) of the healthcare section), employees and their representatives have access to all versions of the written COVID-19 plan at any workplace where the employee or former employee has worked. Second, pursuant to paragraph (n)(3)(ii) of the general section (paragraph (q)(3)(ii) of the healthcare section), any employee, former employee, and anyone having written consent of that employee or former employee have access to the COVID-19 log entry for that employee or former employee. Finally, under paragraph (n)(3)(iii) of the general section (paragraph (q)(3)(iii) of the healthcare section), employees, former employees, and their representatives have a right to access a version of the COVID-19 log that maintains employee privacy. As noted above, the employer must provide these records to these individuals upon request for examination and copying not later than by the end of the next business day.

Employee, and employee representative, access to this information is critical to ensuring full employee participation in employer efforts to prevent COVID-19 exposure in the workplace. For example, access to the COVID-19 log may be helpful for a requesting employee in determining the likelihood of COVID-19 exposure in specific occupations or areas at a workplace. Also, access to information by employee representatives allows them to potentially evaluate exposure information for the employees they represent in different areas throughout a worksite. In addition, access to the information on the COVID-19 log provides a useful check on the accuracy of information entered by the employer and provides greater employee involvement in the COVID-19 protection program at the workplace.

DRAFT

Former employee access to these records is important as well. OSHA finds that the needs of former employees for access to records that could speak to their health are as compelling as the needs of current employees. Therefore, as noted above, OSHA interprets the term "employee" as used in paragraph (n)(3)(i)-(iii) of the general section (paragraph (q)(3)(i)-(iii) of the healthcare section) to provide records access to former employees and their representatives. Employers should note, however, that they may limit the access of a former employee and their representatives to versions of the written COVID-19 plan and the COVID-19 log that were current or otherwise relevant to the former employee's time of employment. In other words, as to the requirement in paragraph (n)(3)(i) of the general section (paragraph (q)(3)(i) of the healthcare section) to provide all versions of the written COVID-19 plan to former employees and their representatives, employers need only provide the versions of the plan that were implemented during the former employees' employment. Similarly, as to the requirement in paragraph (n)(3)(iii) of the general section (paragraph (q)(3)(iii) of the healthcare section) to provide the privacy-protected version of the COVID-19 log to former employees and their representatives, employers are only required to provide log entries for dates on which the former employee was employed by the employer.

Employers should note that employee privacy is protected under the access to records provisions in paragraph (n)(3) of the general section (paragraph (q)(3) of the healthcare section). Unlike the OSHA 300 log, employers are not permitted to disclose the names of employees entered on the COVID-19 log when they provide the COVID-19 log to employees, former employees, or their representatives for copying under paragraph (n)(3)(iii) of the general section (paragraph (q)(3)(iii) of the healthcare section). However, paragraph (n)(3)(ii) of the general section (paragraph (q)(3)(ii) of the healthcare section) does allow a limited exception to this

DRAFT

privacy requirement. Specifically, as noted above, upon request, employers must provide access to the COVID-19 log entry for an individual employee or former employee to that employee or former employee, or to anyone having that employee or former employee's written permission. Consequently, employees, former employees, their representatives, and others can request and receive access to entries about another employee or former employee with that employee or former employee's written permission.

In order to create a version of the COVID-19 log that maintains employee privacy (the version that would be provided under paragraph (n)(3)(iii) of the general section (paragraph (q)(3)(iii) of the healthcare section)), an employer must remove the names, contact information, and occupation of employees. Other information on the COVID-19 log relating to the location where the employee worked, the date of the employee's last day at the workplace, the date of the positive test for, or diagnosis of, COVID-19, and the date the employee first had COVID-19 symptoms must be included in the privacy-protected log. This information is critical for employees and their representatives to assess potential exposures to COVID-19 in the workplace. In addition, as noted above, paragraph (n)(2)(ii)(B) of the general section (paragraph (q)(2)(ii)(B) of the healthcare section) provides that the information in the COVID-19 log must be maintained in a manner consistent with federal confidentiality and privacy requirements. Accordingly, access to the COVID-19 log and the information contained therein must be consistent with federal confidentiality and privacy requirements.

Under the ETS, employees, former employees, and their representatives are entitled to one free copy of each requested record, which is consistent with 29 CFR 1904.35. The cost of providing one free copy to employees, former employees, their representatives is minimal, and these individuals are more likely to access the records if it is without cost. Allowing the

DRAFT

employer to charge for a copy of the record would only delay the production of the information. After receiving an initial, free copy of a requested record or document, an employee, former employee, or representative may be charged a reasonable fee for copying duplicative records. However, no fee may be charged for an update to a previously requested record.

Lastly, paragraph (n)(3)(iv) of the general section (paragraph (q)(3)(iv) of the healthcare section) provides OSHA with a specific right of access. Under this paragraph, employers must provide OSHA with access to the records required to be created and maintained by this section. This means that employers must allow OSHA representatives to examine and copy all versions of the COVID-19 written plan, as well as all information entered on the COVID-19 log, when the OSHA representative asks for the records during a workplace safety and health inspection. OSHA does not believe that its inspectors need to obtain employee permission to access and review personally-identifiable information entered on the COVID-19 log. Gaining this permission would essentially make it impossible to obtain full access to the log in a timely manner, which is needed by OSHA to perform a meaningful workplace investigation. Also, without complete access to the information entered on the log, Agency efforts to conduct immediate intervention or remediation of COVID-19 exposure at a specific workplace would be limited. Finally, OSHA representatives need access to the names entered on the log in order to interview employees at the workplace, and to access employee personnel and medical records.

*Reporting*

OSHA has required employers to report work-related fatalities and certain work-related hospitalizations under its recordkeeping regulation since 1971. These requirements have been an important part of the agency's statutory mission to assure safe and healthful working conditions for all working men and women. All employers covered by the OSH Act, including employers

DRAFT

who are partially exempt from maintaining injury and illness records, are required to comply with OSHA reporting requirements at 29 CFR 1904.39. Under OSHA's current reporting regulation, employers are required to report each work-related fatality to OSHA within 8 hours of the event, and each work-related in-patient hospitalization, amputation, and loss of an eye within 24 hours of the event.

The purpose of the reporting requirement in section 1904.39 is to provide OSHA with information to determine whether it is necessary for the agency to conduct an immediate investigation at a specific establishment. Employer reports of work-related COVID-19 fatalities and in-patient hospitalizations are an important element of the agency's efforts to reduce occupational exposure to the virus. After receiving an employer report, OSHA decides whether an inspection is needed to determine the cause of a work-related COVID-19 fatality or in-patient hospitalization, and whether any OSHA standards may have been violated. These reports are critical for the agency to respond quickly to COVID-19 exposure that may pose an ongoing risk to other employees at the worksite. Timely investigation also allows OSHA to view evidence at a workplace soon after a work-related COVID-19 fatality or in-patient hospitalization has occurred, and can make it easier for the agency to gather relevant information from others at the worksite that might be useful in protecting other employees. Moreover, prompt inspection enables OSHA to gather information to evaluate whether its current standards adequately address the workplace hazard presented from COVID-19. The information gathered from employer reports is also used by the agency to form the basis of statistical data on the causes and remediation of work-related COVID-19 fatalities and in-patient hospitalizations.

In order to address the unique circumstances presented by COVID-19, and to facilitate OSHA investigation and better workplace health surveillance, paragraph (o)(1) of the general

DRAFT

section requires employers covered by that section to report each work-related COVID-19 fatality to OSHA within 8 hours of the employer learning about the fatality, and each work-related COVID-19 in-patient hospitalization to OSHA within 24 hours of the employer learning about the in-patient hospitalization. The same requirements apply to employers covered by the healthcare section through paragraph (r)(1) of that section. As described in more detail in the following discussion, OSHA is adding these additional COVID-19 reporting requirements because the delay in the manifestation and progression of symptoms of COVID-19 can lead to hospitalization or fatality outside the normal window for reporting workplace those events.

Paragraph (o)(1)(i) of the general section (paragraph (r)(1)(i) of the healthcare section) provides that employers must report each work-related COVID-19 fatality to OSHA within 8 hours of the employer learning about the fatality. Under this paragraph, an employer must make a report to OSHA within 8 hours of learning both (1) that an employee has died from a confirmed case of COVID-19, and (2) that the cause of death was the result of a work-related exposure to COVID-19. Employers are only required to report confirmed case of COVID-19 as defined by the Centers for Disease Control and Prevention (CDC) (CDC, May 20, 2020). Typically, the cause of death is determined by the physician who was responsible for a patient who died in a hospital, although the cause of death can also be determined by others such as medical examiners or coroners (Pappas, May 19, 2020).

The requirement in paragraph (o)(1)(i) of the general section (paragraph (r)(1)(i) of the healthcare section) is similar to the fatality reporting requirement in OSHA's regulation at 29 CFR 1904.39(a)(1), which requires an employer to report to OSHA within 8 hours after the death of any employee as the result of a work-related incident. However, 29 CFR 1904.39(b)(6) requires employers to report a work-related fatality to OSHA only if the fatality occurs within 30

DRAFT

days of "the work-related incident." Prior to this ETS, for purposes of reporting events involving COVID-19, OSHA interpreted the phrase "the work-related incident" to mean "exposure" in the work environment. Therefore, in order to be reportable under 29 CFR 1904.39(a)(1), a work-related fatality due to COVID-19 needed to have occurred within 30 days of an employee's exposure in the work environment. Given the potentially-lengthy incubation period of the virus, as well as the possibility of long-term illness before death, the 30-day limitation for reporting fatalities to OSHA could restrict OSHA's ability to receive information about work-related COVID-19 fatalities.

To address these issues, OSHA has chosen not to apply the 30-day limitation period from 29 CFR 1904.39(b)(6) to the reporting provisions in paragraph (o) of the general section (paragraph (r) of the healthcare section) (see paragraph (o)(2)(i) of the general section ((r)(2)(i) of the healthcare section)). Therefore, the requirement to report these fatalities is not limited by the length of time between workplace exposure and death. The reporting of work-related COVID-19 fatalities that occur beyond 30-days from the time of exposure will enable the agency to evaluate more work-related COVID-19 fatalities to determine whether immediate investigations are needed to prevent other employees at the same worksite from being exposed to the virus. Unlike entries in the employer's COVID-19 log, which would typically only be viewed by OSHA if an investigation occurs, the report of these fatalities to OSHA facilitates the agency's timely tracking of this data. Accordingly, paragraph (o)(1)(i) of the general section ((r)(1)(i) of the healthcare section) requires employers to report each work-related COVID-19 fatality to OSHA within 8 hours of the employer learning about the fatality regardless of when the exposure in the work environment occurred.

DRAFT

Paragraph (o)(1)(ii) of the general section (paragraph (r)(1)(ii) of the healthcare section) requires an employer to report each work-related COVID-19 in-patient hospitalization to OSHA within 24 hours of the employer learning about the in-patient hospitalization. Under this paragraph, an employer must make a report to OSHA within 24 hours of learning that (1) an employee has been in-patient hospitalized due to a confirmed case of COVID-19, and (2) the cause of the hospitalization was the result of a work-related exposure to the illness.

OSHA's current reporting regulation at 29 CFR 1904.39(a)(2) provides that, within 24 hours after the in-patient hospitalization of one or more employees, as the result of a work-related incident, an employer must report the in-patient hospitalization to OSHA. 29 CFR 1904.39(b)(6) requires employers to only report in-patient hospitalizations to OSHA if the hospitalization occurs within 24 hours of the work-related incident. For example, if an employee trips in the workplace and sustains an injury on Monday, but is not hospitalized until Thursday, the employer does not need to report the event. In this example, "the work-related incident" occurred on Monday when the employee tripped and was injured in the workplace. Also, under section 1904.39, employers must report in-patient hospitalizations to OSHA within 24 hours of knowing both that the employee has been in-patient hospitalized and that the reason for the hospitalization was the result of "the work-related incident" (see 29 CFR 1904.39(a)(2), (b)(7)-(b)(8)). In non-COVID cases, the work-relatedness of the injury is typically apparently immediately.

Since the beginning of the pandemic, the reporting of work-related COVID-19 in-patient hospitalizations under 29 CFR 1904.39 has presented unique challenges. As noted above, for purposes of reporting COVID-19 fatalities and in-patient hospitalizations, OSHA has interpreted the phrase "the work-related incident" in 29 CFR 1904.39(b)(6) to mean an employee's

DRAFT

"exposure" to COVID-19 in the work environment. Thus, in order to be reportable, an in-patient hospitalization needed to occur within 24 hours of an employee's exposure to COVID-19 in the work environment. Given the potentially-lengthy incubation period of the virus, and the typical timeframe between exposure and the emergence of symptoms serious enough to require hospitalization, it is extremely unlikely for an in-patient hospitalization to occur within 24 hours of an employee's exposure to the virus. Also, in some cases, there has been uncertainty for employers in determining exactly when an employee was exposed in the workplace.

To address these issues, paragraph (o)(1)(ii) of the general section (paragraph (r)(1)(ii) of the healthcare section) does not limit the COVID-19 reporting requirement to only those hospitalizations that occur within 24 hours of exposure, as in 29 CFR 1904.39(b)(6). This change in the reporting requirement will result in OSHA making more determinations as to whether immediate investigations are needed at additional worksites. Given the severity of the disease, and how quickly it can spread, it is essential that remediation efforts at a workplace be undertaken immediately. As noted above, it is critical for OSHA to respond quickly to hazardous conditions where employees have been hospitalized. The elimination of the 24-hour limitation period will not only allow OSHA to receive more employer reports about work-related COVID-19 in-patient hospitalizations and as a result, shed light on where severe COVID-19 events are occurring, but it will also enable the agency to respond more quickly and effectively to these situations. Accordingly, employers must report each work-related COVID-19 in-patient hospitalization to OSHA regardless of when the employee's exposure in the workplace occurred (paragraphs (o)(1)(ii) of the general section and (r)(1)(ii) of the healthcare section). But consistent with OSHA's normal reporting requirements, when hospitalization for a work-related

DRAFT

case of COVID-19 does occur, the employer must report it within 24 hours of learning about the hospitalization.

Additionally, for purposes of this section, OSHA defines in-patient hospitalization as a formal admission to the in-patient services of a hospital or clinic for care or treatment (see 29 CFR 1904.39(b)(9) and (b)(10)). The determination as to whether an employee is formally admitted into the in-patient service is made by the hospital or clinic. Treatment in an Emergency Room only is not reportable.

Work-Relatedness Determinations

Given the nature of the disease, and the extent of community spread, in some cases, it may be difficult for an employer to determine whether an employee's COVID-19 illness is work-related, especially when an employee has experienced potential exposure both in and out of the workplace. For purposes of this section, when evaluating whether a fatality or in-patient hospitalization is the result of a work-related case of COVID-19, employers must follow the criteria in OSHA's recordkeeping regulation at 29 CFR 1904.5 for determining work-relatedness. Applying the criteria in 29 CFR 1904.5 under paragraph (o) of the general section (paragraph (r) of the healthcare section) is consistent with how employers make work-relatedness determinations when reporting fatalities and other serious events under 29 CFR 1904.39.

Under section 1904.5, employers must consider an injury or illness to be work-related if an event or exposure in the work environment either caused or contributed to the resulting condition, or significantly aggravated a pre-existing injury or illness. An injury or illness is presumed work-related if it results from events or exposures occurring in the work environment, unless an exception in section 1904.5(b)(2) specifically applies. Under this language, an injury or

DRAFT

illness is presumed work-related if an event or exposure in the work environment is a discernable cause of the injury or illness (see 66 Fed. Reg. 66,943 (December 27, 2001)).

According to 29 CFR 1904.5(b)(3), the "work environment" includes the employer's establishment and any other location where work is performed or where employees are present as a condition of their employment. Under 29 CFR 1904.5(b)(3), employers should evaluate the employee's work duties and environment and determine whether it is more likely than not that exposure at work caused or contributed to the illness (see 66 Fed. Reg. 5958-59 (January 19, 2001)).

Because of the typical incubation period of 3 to 14 days, an employee's exposure to COVID-19 will usually be determined after the fact. Employers must make reasonable efforts to acquire the necessary information to make good faith work-relatedness determinations under this section. In addition, the employer should rely on information that is reasonably available at the time of the fatality or in-patient hospitalization.

A work-related exposure in the work environment would likely include close contact with a person known to be infected with COVID-19 or common high-touch areas or items. For example, although work-relatedness must be determined on a case-by-case basis, if a number of COVID-19 illnesses develop among coworkers who work closely together without an alternative explanation, it is reasonable to conclude that an employee's fatality or in-patient hospitalization is work-related. On the other hand, if there is not a known exposure to COVID-19 that would trigger the presumption of work-relatedness, the employer must evaluate the employee's work duties and environment to determine whether it is more likely than not that the employee was exposed to COVID-19 during the course of their employment. Employers should consider factors such as:

DRAFT

- The type, extent, and duration of contact the employee had at the work environment with other people, particularly the general public.
- Physical distancing and other controls that impact the likelihood of work-related exposure.
- The extent and duration of time spent in a shared indoor space with limited ventilation.
- Whether the employee had work-related contact with anyone who exhibited signs and symptoms of COVID-19.

Time Periods for Reporting COVID-19 Fatalities and In-Patient Hospitalizations

As noted above, under paragraph (o) of the general section (paragraph (r) of the healthcare section), employers must report each work-related COVID-19 fatality or hospitalization to OSHA within the timeframes based on when any agent or employee of the employer becomes aware of the reportable event. For example, an employer "learns" of a COVID-19 fatality or in-patient hospitalization when a supervisor, receptionist, or other employee at the company receives information from a family member or medical professional about an employee fatality or in-patient hospitalization. It is the employer's responsibility to ensure that appropriate instructions and procedures are in place so that managers, supervisors, medical personnel, as well as other employees or agents of the company, who learn of an employee's death or in-patient hospitalization due to COVID-19 know that the company must make a report to OSHA.

Consistent with OSHA's regulation at 29 CFR 1904.39, the reporting clock begins to run with the occurrence of the reportable event. Under paragraph (o) of the general section (paragraph (r) of the healthcare section), in situations where the employer or the employer's agent does not learn about the work-related COVID-19 fatality or in-patient hospitalization right

DRAFT

away, the employer must make the report to OSHA within 8 hours for a fatality, or 24 hours for an in-patient hospitalization, from the time the employer (or the employer's agent) learns about the reportable event. For example, if an employee dies from a work-related case of COVID-19 on Sunday at 6:00 a.m., but the employer does not learn about the death until Monday at 8:00 a.m., the employer has until 4:00 p.m. that day to make the report to OSHA. Similarly, if an employee is in-patient hospitalized for a work-related case of COVID-19 at 8:30 p.m. on Monday, but the employer or the employer's agent(s) does not learn about the hospitalization until 9:00 a.m. the next day (Tuesday), then the employer would be required to make the report to OSHA within 24 hours of learning of the in-patient hospitalization (i.e., by 9:00 a.m. on Wednesday) (see 29 CFR 1904.39(b)(7)).

Likewise, if an employer does not learn right away that a reportable fatality or in-patient hospitalization is work-related, the employer must make the report to OSHA within 8 hours or 24 hours of learning that the death or in-patient hospitalization was the result of a work-related COVID-19 exposure. For example, if an employee is in-patient hospitalized for a case of COVID-19 at 9:00 a.m. on Monday, but the employer does not have enough information to make a work-relatedness determination until 11:00 a.m. on Monday, then the employer would be required to report the hospitalization within 24 hours of learning that the hospitalization was work-related (i.e., by 11:00 a.m. on Tuesday) (see 29 CFR 1904.39(b)(8)).

Finally, if an employer makes a report to OSHA concerning a work-related COVID-19 in-patient hospitalization and that employee subsequently dies from the illness, the employer does not need to make an additional fatality report to OSHA.

<u>How to Report COVID-19 Fatalities and In-Patient Hospitalizations and What Information Must be Included in the Report</u>

DRAFT

Paragraph (o)(2) of general section (paragraph (r)(2) of the healthcare section) provides that when reporting work-related COVID-19 fatalities and in-patient hospitalizations to OSHA, the employer must follow the requirements in 29 CFR 1904.39, except for 29 CFR 1904.39(a)(1)-(2) and (b)(6). As explained above, OSHA has included specific provisions for the reporting of work-related COVID-19 fatalities and in-patient hospitalizations that differ from 29 CFR 1904.39. However, when making COVID-19 fatality and in-patient hospitalization reports to OSHA, employers must follow the other reporting procedures set forth in section 1904.39. Specifically, under section 1904.39(a)(3), employers have three options for reporting work-related COVID-19 fatalities and in-patient hospitalizations to OSHA:

1. by telephone to the OSHA Area Office that is nearest to the site of the incident;
2. by telephone to the OSHA toll-free central telephone number, 1-800-321-OSHA (1-800-321-6742);
3. by electronic submission using the reporting application located on OSHA's public Web site at *www.osha.gov*.

Section 1904.39(a)(3) also allows employers to report work-related COVID-19 fatalities and in-patient hospitalizations to OSHA in person to the OSHA Area Office that is nearest to the site of the incident. However, because many OSHA Area Offices are closed to the public during the COVID-19 pandemic, employers must use one of the three options listed above. In addition, section 1904.39(b)(1) makes clear that, if the OSHA Area Office is closed, an employer may not report a work-related COVID-19 fatality or in-patient hospitalization by leaving a message on OSHA's answering machine, faxing the Area Office, or sending an email. Instead, the employer must make the report by using the 800 number or the reporting application located on OSHA's public web site at *www.osha.gov*.

DRAFT

The other provisions in 29 CFR 1904.39 (except for 29 CFR 1904.39(a)(1)-(2) and (b)(6)) also apply to the reports required by paragraph (o) of general section (paragraph (r) of the healthcare section). For example, employers should consult 29 CFR 1904.39(b)(2) to determine what information employers must give to OSHA when making reports of work-related COVID-19 fatality or in-patient hospitalization. Per that provision, employers must give OSHA the following information for each fatality or in-patient hospitalization: the establishment name, the location of the work-related incident, the time of the work-related incident, the type of reportable event (i.e., fatality or in-patient hospitalization), the number of employees who suffered a fatality or in-patient hospitalization, the names of the employees who suffered a fatality or in-patient hospitalization, the employer's contact person and his or her phone number, and a brief description of the work-related incident.

**Reporting Sum Ex References:**

Centers for Disease Control and Prevention. (2020, May 20). *Reporting and Coding Deaths Due to COVID-19.* https://www.cdc.gov/nchs/covid19/coding-and-reporting.htm (CDC, May 20, 2020)

Pappas S. (2020, May 19). *How COVID-19 Deaths are Counted*. Scientific American. https://www.scientificamerican.com/article/how-covid-19-deaths-are-counted1/ (Pappas, May 19, 2020)

*Dates*

To minimize transmission of COVID-19 in the workplace, it is essential that employers ensure that the provisions of this ETS are implemented as quickly as possible, but no later than the dates outlined in paragraph (p) of the general section and paragraph (s) of the healthcare section. These paragraphs set forth the effective date of those sections and the compliance dates for specific requirements of the standard. Additionally, paragraph (e) of the mini respiratory protection program section of this ETS (29 CFR 1910.504) contains effective and compliance

DRAFT

dates for that section. The effective date for all three of these sections, as required by section 6(c)(1) of the OSH Act (29 U.S.C. 655(c)(1)), is the date of publication in the *Federal Register*. The compliance date for all provisions in the general section is 14 days after the effective date, except for the requirements in paragraphs (e) and (h), which must be complied with within 30 days of the effective date. The compliance date for all provisions in the healthcare section is 14 days after the effective date, except for paragraphs (i), (k), and (n), which must be complied with within 30 days of the effective date. The compliance date for all provisions in the mini respiratory protection program section is 14 days after the effective date. The Secretary determined that all requirements under § 1910.501, § 1910.502, and § 1910.504 are necessary and feasible. Given the grave danger to employees from occupational exposure to COVID-19, as previously described, the effective date and compliance dates provided for this ETS are reasonable and appropriate.

For over a year—since at least January 2020, when the Secretary of Health and Human Services declared COVID-19 to be a public health emergency for the entire United States —all employers have been made acutely aware of the importance of minimizing employees' exposure to COVID-19 and many employers have willingly joined the global response to stop the spread of COVID-19. Therefore, OSHA anticipates that many employers will already be compliant with many of the requirements of this standard by the effective date. However, the rule provides flexibility for employers who may need some time to become compliant with all of the provisions in the relevant section(s) of the ETS. OSHA set the compliance dates to allow sufficient time for employers to obtain and read the standard, figure out its requirements, and undertake the necessary steps for compliance.

DRAFT

OSHA anticipates that employers will be able to implement measures to comply with most provisions of the standard within 14 days. Even in situations where an employer has not previously taken any steps to address COVID-19 hazards in the workplace, the requirements for COVID-19 plans, physical distancing, face coverings, and most other measures required under the standard can readily be met within the 14-day time period. These measures do not require extensive lead times to implement. Similarly, the mini respiratory protection program in § 1910.504 was expressly designed to simplify compliance for employers, and such a program can be readily implemented within the 14-day time period.

The standard provides a longer period of time for employers to comply with the requirements for physical barriers. Paragraph (e) of the general section (paragraph (i) of the healthcare section) requires the use of cleanable solid barriers at fixed work locations when physical distancing cannot be maintained, unless the employer can demonstrate barriers are not feasible. Many employers installed physical barriers prior to the publication of this ETS in order to mitigate the risks of COVID-19 exposure, but OSHA anticipates that some employers may need to adjust existing barriers or install new barriers to comply with the standard. Some of these employers may find it necessary to use designs that require custom fabrication or installation by contractors. Consequently, the standard provides 30 days from the date of publication before compliance with the provisions addressing physical barriers is required so that employers have adequate time, where necessary, to design and install effective barriers in their workplaces.

The standard also provides a longer period of time for employers to comply with the ventilation requirements. Paragraph (h) of the general section (paragraph (k) of the healthcare section) requires employers to ensure existing HVAC systems serving their workplace are used in accordance with the HVAC manufacturer's instructions, the design specifications of the

DRAFT

HVAC system(s), and the requirements in these paragraphs of the ETS sections. The ventilation provisions also require employers to ensure the use of MERV-13 filters or the highest-efficiency filters that are compatible with their HVAC system and to replace filters as necessary. OSHA anticipates that some employers may need additional time to assess their existing HVAC systems to ensure they are operating in accordance with the requirements of the standard, including upgrading filters when necessary. For example, some employers may need to make arrangements with an HVAC technician to assess, adjust, and maintain the HVAC system. Consequently, the standard provides 30 days from the date of publication in the *Federal Register* before compliance with the provisions addressing ventilation of workplaces is required.

Finally, OSHA has provided employers with additional time (again, 30 days from the effective date) to comply with the training requirements in paragraph (n) of the healthcare section. Paragraph (k) of the general section (paragraph (n) of the healthcare section) requires employers to provide training to each employee. Employers covered by the general section must provide that training within 14 days from publication of the ETS in the *Federal Register*. However, the training requirements in the healthcare section of the ETS go beyond those in the general section. Paragraph (n)(3) of the healthcare section includes a requirement for training to be overseen or conducted by a person knowledgeable in the covered subject matter as it relates to the employee's job duties. Additionally, paragraph (n)(4) of the healthcare section requires training which provides an opportunity for interactive questions and answers in a "live" format. Because of these additional requirements, OSHA recognizes that employers may need more time to fully meet the training requirements in the healthcare section. Therefore, the standard requires compliance with the training provisions in the healthcare section within 30 days from the date of publication in the *Federal Register*.

DRAFT

Employers covered by the general section have 30 days to comply with the requirements for physical barriers (paragraph (e)) and ventilation (paragraph (h)), and 14 days to comply with the training requirements in paragraph (k). These staggered compliance dates could result in a situation in which an employer is not able to provide all training required under paragraph (k) of the general section within 14 days, because the employer has not yet developed its workplace-specific policies and procedures on physical barriers or ventilation. If this is the case, the employer is permitted to provide the training on these measures after they are implemented (see paragraph (k)(2)(ii) of the general section, which requires additional training when policies or procedures change).

Compliance with the requirements of the ETS within the specified dates is achievable. Many employers are likely already in compliance with many of the provisions of the ETS, such as provisions for physical distancing, physical barriers, and cleaning and disinfection. Resources are also readily available to help employers achieve compliance. These resources include guidance issued by OSHA, the CDC, state and local governments, trade associations, and other organizations to help employers understand the risks and successfully minimize the transmission of COVID-19 in the workplace. OSHA therefore concludes that the compliance dates in this ETS are reasonable.

Still, OSHA's experience with promulgating standards shows that, in isolated circumstances, some employers will, despite their best efforts, be unable to comply with all requirements within the specified compliance dates. In particular, OSHA recognizes that requirements for physical barriers and ventilation may involve factors that are outside of the employer's control. For example, in exceptional circumstances, specialized barriers may require design, fabrication, and installation that may require more than 30 days to complete. OSHA is

DRAFT

willing to use its enforcement discretion in situations where an employer can show it has made good faith efforts to comply with the requirements of the standard, but has been unable to do so.

*Patient screening/management*

Patient screening and management strategies aim to identify and manage those individuals who may have COVID-19 before entering a facility so that appropriate precautions can be implemented to prevent transmission to others within the workplace. Therefore, paragraph (d) of the healthcare section includes provisions for screening and management of persons, including patients, entering settings where direct patient care is provided. The patient screening and management required under paragraph (d) of the healthcare section, §1910.502, is in addition to health screening for employees that is required under (l)(1) of the same section. The additional screening required under paragraph (d) would not extend to employers covered by the healthcare section that do not provide direct patient care.

Paragraph (d)(1) of the healthcare section requires that employers in a healthcare or associated industry setting must limit the number of entrances to the facility, as well as provide a monitoring system for each point of entry to ensure that persons do not enter the facility without going through screening. This provision would not apply to emergency responders or other licensed healthcare providers entering a non-healthcare setting or private residence to provide healthcare services. For example, this provision would not apply to a school nurse providing care to a student in a classroom, or a paramedic providing care to a person in their private residence.

Under paragraph (d)(2) of the healthcare section, employers must screen all individuals who enter the facility (e.g., clients, patients, residents, delivery people and other visitors, and other non-employees) for symptoms of COVID-19. This screening is an important aspect of a multi-layered approach, even though it will not identify asymptomatic or pre-symptomatic

DRAFT

individuals. Employers must update their COVID-19 plan, including a written COVID-19 plan with their screening and management procedures if the workplace setting has more than 10 employees. As noted following paragraph (d) of the healthcare section, the use of telehealth services, when appropriate and available, is encouraged. For example, employers may use phone or video platforms to conduct screening on a patient, client, resident, or other visitor prior to their arrival at the facility. This process helps to reduce the number of individuals entering a facility as well as reduce employee exposure, while not compromising the health screening of the patient.

Screening may take several forms depending on the design and size of the facility. This screening should include monitoring temperatures, assessing the presence of COVID-19 symptoms, confirming that individuals are abiding by the policies and procedures for wearing face coverings in accordance with paragraph (c), and assessing the individual's recent exposure to COVID-19. For example, at each entrance there may need to be an employee present to perform a health screening on each individual entering the facility. The employer should post visual alerts (e.g., signs, posters) at the entrance and in other strategic places (e.g., waiting areas, elevators) that provide instructions in appropriate languages and education levels about wearing face coverings, maintaining physical distancing, and performing timely hand hygiene and proper respiratory etiquette. It may be necessary to provide supplies for hand and respiratory hygiene, including face coverings, hand sanitizer (60-95% alcohol), tissues, and no-touch waste receptacles at entrances, in waiting areas, and at patient check-ins.

Under this same provision (paragraph (d)(2) of the healthcare section), employers are also required to establish policies to triage any individual that may be experiencing COVID-19 symptoms. Visitors who present with COVID-19 symptoms may be restricted from entering and referred to a physician for proper evaluation. In ambulatory care settings (e.g., surgery centers,

DRAFT

physicians' offices, and home health/hospice visits), a survey of health questions should be reviewed with the patient prior to entry to determine if the patient has been exposed to COVID-19, or demonstrates symptoms of the disease. When an in-person visit is unavoidable, each employer must develop policies and procedures, including those in the remaining provisions of the healthcare section, to triage those patients and ensure employee protection from COVID-19 transmission. Patients presenting for an in-person office visit should be isolated either in a separate area (e.g., examination room) with the door closed or asked to wait in their vehicle to be called in for their appointment. As stated previously, temperature monitoring upon arrival, health survey questions, and hand hygiene should be performed, and patients must use face coverings in compliance with the policies of the workplace. Employers should have policies in place if screening or triage reveals that the patient has likely been exposed to COVID-19 or may have an active infection. Such policies could include, but are not limited to: rescheduling of surgery, physician visit, or home health visit; referral for treatment and isolation of the patient to a separate area; if at a home visit, leaving the residence and rescheduling the visit; and follow-up treatment for the employee if exposed. The CDC offers additional guidance on triaging patients (CDC, February 25, 2021).

Paragraph (d)(3) of the healthcare section requires employers to implement other applicable patient management strategies in accordance with the "CDC's COVID-19 Infection Prevention and Control Recommendations", which is incorporated by reference as specified in 29 CFR 1910.509 (CDC, February 10, 2021). For example, patients who have been admitted may need to be screened daily for new fever onset or other suspected COVID-19 symptoms, as they may require additional medical treatment, or may need placement on appropriate Transmission-Based Precautions (see next section). If the admitted patient develops a high fever

DRAFT

and persistent cough, which may indicate a possible COVID-19 infection, that patient may need to be isolated in a private room and placed under Droplet Precautions. Transmission-Based Precautions are further described in the *Summary and Explanation* of Standard and Transmission-Based Precautions.

**Patient Screening and Management Summary and Explanation References**

Centers for Disease Control and Prevention (CDC). (2021, February 10).*Interim Infection Prevention and Control Recommendations for Healthcare Personnel During the Coronavirus Disease 2019 (COVID-19) Pandemic*. https://www.cdc.gov/coronavirus/2019-ncov/hcp/infection-control-recommendations.html (CDC, February 10, 2021)

Centers for Disease Control and Prevention (CDC). (2021, February 25). *Triaging Sick Patients*. https://www.cdc.gov/coronavirus/2019-ncov/hcp/non-us-settings/sop-triage-prevent-transmission.html (CDC, February 25, 2021)

*Standard and Transmission-Based Precautions / Recognized Good Biosafety Practices*.

Standard and Transmission-Based Precautions are the cornerstone for all infection prevention activities to prevent the transmission of communicable diseases to employees, patients, and other non-employees in healthcare and associated industries. Under paragraph (e)(1) of the healthcare section, in settings where healthcare services, healthcare support services, or mortuary services are provided, employers are required to develop and implement policies and procedures that adhere to Standard and Transmission-Based Precautions in accordance with "CDC's Guidelines for Isolation Precautions" (incorporated by reference, § 1910.509). The "CDC's Guidelines for Isolation Precautions*"* (Siegel et al., 2007) is an authoritative standard for infection prevention and control. Paragraph (e)(1) of the healthcare section applies, for example, to: settings where direct patient care occurs (e.g., hospitals, ambulatory care clinics); healthcare laundry services; medical equipment reprocessing facilities; medical waste facilities; and mortuaries. For more information about healthcare services, healthcare support services, and handling of human remains, please see the discussion of Scope in this section of the preamble.

DRAFT

Standard Precautions must be implemented regardless of the presence of a suspected or confirmed infectious agent, such as COVID-19. The use of Standard Precautions thus relies on the assumption that every patient, all potentially-contaminated materials (e.g., patient laundry), and all human remains in healthcare and other applicable settings (e.g., mortuaries, off-site laundries) are potentially infected or colonized with an infectious agent. Standard Precautions are similar to, but more extensive than, "universal precautions," which are required by OSHA's Bloodborne Pathogens standard (the BBP standard, 29 CFR 1910.1030), to prevent contact with blood or other potentially infectious materials (as that term is defined in the BBP standard). Standard Precautions were developed to integrate principles of universal precautions into broader principles pertaining to routes of exposure other than the bloodborne route, such as via the contact, droplet, or airborne routes. For example, although the BBP standard might not apply, Standard Precautions would be utilized when employees are exposed to urine, feces, nasal secretions, sputum, vomit, and other body fluids, and also when employees are exposed to mucous membranes and non-intact skin (Siegel et al., 2007). Standard Precautions assume that when there is exposure to these materials, the materials potentially contain infectious agents that could be transmitted via the contact, droplet, or airborne routes.

The infection prevention and control methods used under Standard Precautions will likely be similar to, but more extensive than, what employers should already be implementing to protect employees against exposures under the BBP standard. Standard Precautions not only include the infection control methods specified as universal precautions (e.g., hand hygiene, the use of certain types of PPE based on anticipated exposure, safe injection practices, and safe management of contaminated equipment and other items in the patient environment), but also include, for example, respiratory and cough etiquette (Siegel et al., 2007).

DRAFT

Transmission-Based Precautions are infection control practices that are used in tandem with Standard Precautions but are based on the way an infectious agent(s) may be transmitted. Transmission-Based Precautions are the second tier of basic infection control and are to be used in addition to Standard Precautions for patients who may be infected or colonized with certain infectious agents, such as COVID-19, for which additional precautions are needed to prevent infection transmission. Unlike Standard Precautions, Transmission-Based Precautions are only implemented if the presence of an infectious agent, such as COVID-19, is suspected or confirmed.

There are three categories of Transmission-Based Precautions: Contact Precautions, Droplet Precautions, and Airborne Precautions (Siegel et al., 2007).[31] For diseases that have multiple routes of transmission, more than one category of Transmission-Based Precautions must be used. Whether one category or multiple categories of Transmission-Based Precautions are used, they are always used in addition to Standard Precautions. As described in *Grave Danger* (Section IV of this preamble), COVID-19 is capable of contact, droplet, and airborne transmission in healthcare settings. As such, employers must follow the appropriate precautions specified for these transmission pathways, as applicable to their workplaces.

An extensive review of current policies and procedures will help employers ensure that paragraph (e)(1) is met; when necessary, employers must develop and implement any missing policies and procedures to adhere to Standard and Transmission-Based Precautions. There may be instances where employers will decide not to treat suspected or confirmed COVID-19

DRAFT

[31] Contact Precautions are designed to prevent transmission of infectious agents spread by direct or indirect physical contact with an infected or contaminated individual, item, or surface. Droplet Precautions are designed to prevent transmission of infectious agents spread by direct respiratory or mucous membrane contact with infectious droplets. Airborne Precautions are designed to prevent transmission of infectious agents that remain infectious over long distances and time when suspended in the air. (Siegel et al., 2007).

patients, and an official policy to that effect might preclude the need for some policies and procedures. For example, in an oral healthcare setting (e.g., dentistry, orthodontics), an employer might not need to develop and implement procedures for Transmission-Based Precautions if the employer develops and implements policies and procedures stating that the office will not treat, and will reschedule appointments for, any patients who are experiencing symptoms of COVID-19, are COVID-19 positive, or have been in close contact with someone who is COVID-19 positive. If, however, the employer continues to see patients with suspected or confirmed COVID-19, the employer must develop and implement policies and procedures for Transmission-Based Precautions. Additional details on Standard and Transmission-Based Precautions are also available in *Need for Specific Provisions* (Section V of this preamble).

Paragraph (e)(2) of the healthcare section requires that, in settings where biomedical laboratory operations are conducted, the employer must develop and implement policies and procedures to adhere to recognized good biosafety practices. A fundamental objective of all biosafety programs is the containment of potentially harmful biological agents. Recognized good biosafety practices include strict adherence to standard microbiological practices and techniques, such as wearing appropriate PPE, practicing good hand hygiene, implementing restrictions on eating, drinking and smoking, prohibiting mouth pipetting, adopting policies for the safe handling of sharps, using biosafety cabinets when manipulating infectious agent specimens and cultures, and minimizing aerosol-generating events, as well as special practices needed when standard microbiological practices and techniques are not sufficient to control the hazard (Miller et al., January 6, 2012).

Paragraph (e)(2) is intended to ensure practices employed at biomedical laboratories to protect employees are effective and reliable. Recognized good biosafety practices must meet

DRAFT

two criteria: they must be "good" and they must be "recognized." To be "good," a biosafety practice must prevent, minimize, or effectively reduce the risk of COVID-19 transmission in settings where biomedical operations are conducted. If the biosafety practices implemented by the employer do not prevent, minimize, or effectively reduce the risk of COVID-19 transmission, that employer will not have protected its employees from the COVID-19 hazard. To be "recognized," experts in infection control and biosafety must have concluded that a biosafety practice will prevent, minimize, or effectively reduce the risk of COVID-19 transmission (i.e., that it is good), and that conclusion must have been subject to robust review and been accepted by a relevant expert body or community (such as the CDC or the World Health Organization). The need for recognized good biosafety practices is further discussed in *Needs for Specific Provisions* (Section V of this preamble).

OSHA notes that the CDC has issued general and COVID-19 specific recommendations that can inform employers developing and implementing both Standard and Transmission-Based Precautions in accordance with "CDC's Guidelines for Isolation Precautions" (Siegel et al., 2007) and recognized good biosafety practices. In developing policies and procedures in accordance with paragraph (e) of the healthcare section, employers can look to a variety of sources, including *Interim Infection Prevention and Control Recommendations for Healthcare Personnel During the Coronavirus Disease 2019 (COVID-19) Pandemic* (CDC, February 10, 2021); *Discontinuation of Transmission-Based Precautions and Disposition of Patients with COVID-19 in Healthcare Settings (Interim Guidance)* (CDC, February 16, 2021); *Biosafety in Microbiological and Biomedical Laboratories* (Meechan and Potts, June 2020); *Interim Laboratory Biosafety Guidelines for Handling and Processing Specimens Associated with Coronavirus Disease (COVID-19)* (CDC, January 6, 2021); *Frequently Asked Questions about*

DRAFT

*Coronavirus (COVID-19) for Laboratories* (CDC, February 25, 2021); and *Collection and Submission of Postmortem Specimens from Deceased Persons with Confirmed or Suspected COVID-19: Postmortem Guidance* (CDC, December 2, 2020). As discussed in *Technological Feasibility* (Section VI of this preamble), many employers subject to the healthcare section have already implemented these guidelines in their workplaces, and the control practices contained in these guidelines are technologically feasible.

**Standard and Transmission-Based Precautions/Recognized Good Biosafety Practices Summary and Explanation References:**


Centers for Disease Control and Prevention (CDC). (2020, December 2). *Collection and Submission of Postmortem Specimens from Deceased Persons with Confirmed or Suspected COVID-19: Postmortem Guidance.* https://www.cdc.gov/coronavirus/2019-ncov/hcp/guidance-postmortem-specimens.html (CDC, December 2, 2020)

Centers for Disease Control and Prevention (CDC). (2021, January 6). *Interim Laboratory Biosafety Guidelines for Handling and Processing Specimens Associated with Coronavirus Disease (COVID-19).* https://www.cdc.gov/coronavirus/2019-nCoV/lab/lab-biosafety-guidelines.html (CDC, January 6, 2021)

Centers for Disease Control and Prevention (CDC). (2021, February 10). *Interim Infection Prevention and Control Recommendations for Healthcare Personnel During the Coronavirus Disease 2019 (COVID-19) Pandemic*. https://www.cdc.gov/coronavirus/2019-ncov/hcp/infection-control-recommendations.html (CDC, February 10, 2021)

Centers for Disease Control and Prevention (CDC). (2021, February 16). *Discontinuation of Transmission-Based Precautions and Disposition of Patients with COVID-19 in Healthcare Settings (Interim Guidance).* https://www.cdc.gov/coronavirus/2019-ncov/hcp/disposition-hospitalized-patients.html (CDC, February, 16, 2021)

Centers for Disease Control and Prevention (CDC). (2021, February 25, 2021). *Frequently Asked Questions about Coronavirus (COVID-19) for Laboratories.* https://www.cdc.gov/coronavirus/2019-ncov/lab/faqs.html (CDC, February 25, 2021)

Meechan, P. J., & Potts, J. (2020). Biosafety in microbiological and biomedical laboratories. 6th Edition. https://www.cdc.gov/labs/pdf/SF__19_308133-A_BMBL6_00-BOOK-WEB-final-3.pdf. (Accessed February 11, 2021) (Meechan and Potts, June 2020)

Miller JM, Astles R, Baszler T, Chapin K, Carey R, Garcia L, Gray L, Larone D, Pentella M, Pollock A, Shapiro DS, Weirich E, Wiedbrauk D. (2012, January 6). Guidelines for Safe Work


DRAFT

Practices in Human and Animal Medical Diagnostic Laboratories Recommendations of a CDC-convened, Biosafety Blue Ribbon Panel. Centers for Disease Control and Prevention (CDC) Morbidity and Mortality Weekly Report. 61:105pp. https://www.cdc.gov/mmwr/pdf/other/su6101.pdf (Miller et al., January 6, 2012)

Siegel JD, Rhinehart E, Jackson M, Chiarello L, and the Healthcare Infection Control Practices Advisory Committee. (2007). 2007 Guideline for Isolation Precautions: Preventing Transmission of Infectious Agents in Healthcare Settings. Centers for Disease Control and Prevention. https://www.cdc.gov/infectioncontrol/guidelines/isolation/index.html (Siegel et al., 2007)

*Personal protective equipment (PPE)*

**Facemasks**

Paragraph (f) of the healthcare section contains requirements for personal protective equipment (PPE). First, paragraph (f)(1) addresses the use of facemasks. Facemasks are required by the healthcare section because they offer both source control (i.e., reducing the spread of large respiratory droplets to others by covering an infected person's mouth and nose) and protection for the wearer. As defined in paragraph (b), *facemasks* are surgical, medical procedure, dental, or isolation masks that are FDA-cleared or authorized by an FDA EUA. Facemasks are intended for a medical purpose, such as prevention of infectious disease transmission (including uses related to COVID-19), and in this manner they function as source control. Facemasks also function as a barrier to protect the wearer from hazards such as splashes or large droplets of blood or bodily fluids. A detailed discussion on the use of facemasks in healthcare and associated industries is in *Need for Specific Provisions* (Section V of the preamble).

Paragraph (f)(1)(i) imposes the requirement that employers must provide, and ensure that employees wear, a facemask that meets the definition in paragraph (b) of this section. Facemasks provide protection against exposure to splashes, sprays, and spatter of body fluids from patients and others—a hazard to which many employees in healthcare industries are exposed—and therefore are required for those employees. This requirement is based on CDC recommendations

DRAFT

(CDC, February 10, 2021), and OSHA has previously established that facemasks are essential PPE for employees in healthcare and associated industries, under both the general PPE standard (29 CFR 1910.132) and the Bloodborne Pathogens standard (29 CFR 1910.1030).

For most situations, the ETS requires only facemasks. However, OSHA recognizes that respirators or surgical respirators can provide better employee protection, particularly in situations where physical distancing and physical barriers are not feasible (e.g., performing direct patient care tasks that do not involve exposure to people with suspected or confirmed COVID-19). Alternatively, employers could provide face shields to wear over the facemasks in the same situations when additional protection is desired. OSHA notes that face shields can amplify the protection offered by facemasks and provide additional eye protection to the wearer in situations where regular, close contact with other people is expected. Further, the agency encourages the use of face shields as an additional form of protection for the wearer, even when not required. Respirators and face shields are addressed in more detail in the following discussion, as well as in the *Need for Specific Provisions* (Section V of the preamble).

Paragraph (f)(1)(ii) of the healthcare section requires that employers ensure a facemask is worn over the nose and mouth when an employee is indoors, outdoors and less than 6 feet away from another person, and when riding in a vehicle with another person for work purposes. To be worn properly, facemasks need to completely cover the wearer's mouth and nose, and fit snugly against the sides of the face without gaps. Employers must train employees on when and how to properly wear a facemask in accordance with paragraph (n) of the healthcare section. Additionally, to ensure facemasks are worn properly, an employer might appoint a manager or senior employee to check that each employee is properly wearing a facemask at the start of and throughout each shift. To serve as additional reminders for employees, employers may want to

DRAFT

play public service announcements or display signs/posters throughout the facility about proper facemask usage.

Paragraph (f)(1)(ii) further requires employers to provide a sufficient number of facemasks to each employee as needed to comply with paragraph (f) and to ensure that each employee changes facemasks at least one per day, whenever they are soiled or damaged, and more frequently as necessary (e.g., patient care reasons). Facemasks can become soiled or dirty by splashes, sprays, or spatters, from contact with a contaminated surface, or by touching/adjusting it with contaminated hands. Because facemasks can become soiled after each use with bacteria and viruses, including the virus that causes COVID-19, it is important they are replaced as specified in this paragraph, including when they are soiled or damaged. Thus, employers are required to provide a sufficient number of facemasks to each employee to ensure compliance with these provisions.

Employers might consider providing supplemental face shields (further described below) to wear over facemasks, which would reduce the frequency with which they become soiled and the rate at which employees would have to change them during the day.

Paragraph (f)(1)(iii) of the healthcare section contains exceptions to the facemask requirements imposed in paragraph (f)(1)(ii) of this section. First, as described in paragraph (f)(1)(iii)(A), when an employee is alone in a room, they are not required to wear a facemask. However, if the employee exits the room or another individual enters the room, facemasks are required.

Under another exception, paragraph (f)(1)(iii)(B), employees are not required to wear facemasks while eating or drinking at the workplace, as long as each employee is at least 6 feet apart or separated by physical barriers from all other people. Employers may accomplish this by

DRAFT

staggering break times, allowing use of non-traditional break areas (e.g., conference rooms), or letting employees eat or drink outside where there may be more space, to ensure each employee is at least 6 feet apart while eating or drinking. Additional information on physical distancing and physical barriers, is discussed further in the *Summary and Explanation* for paragraphs (h) and (i) of the healthcare section, respectively.

The next exception, under paragraph (f)(1)(iii)(C), provides that facemasks are not required for employees when they are wearing respiratory protection in accordance with 29 CFR 1910.134 or paragraph (f) of this section. Employees required to use respiratory protection in accordance with 29 CFR 1910.134 for certain workplace hazards unrelated to the COVID-19 pandemic are exempt from the facemask requirements outlined in paragraph (f)(1) while they are wearing the respirators. Respirators provide some source control but also more critical protection to the wearer when it is not possible to wear both. Similarly, while employees are wearing respirators in connection with the COVID-19 hazard, as required in paragraphs (f)(2)-(f)(3) and (f)(5)-(f)(6), they are exempt from the facemask requirement. Finally, employees using respirators in compliance with the mini respiratory protection program section of this standard for voluntary respirator use are also exempt from the facemask requirement in paragraph (f)(1) while wearing a respirator. This is discussed in further detail in paragraph (f)(4) of the healthcare section on employee use of respirators when they are not required.

Paragraph (f)(1)(iii)(D) contains another exception for facemask use when it is important to see a person's mouth (e.g., communicating with a hearing-impaired person) and the conditions do not permit a facemask that is constructed of clear plastic (or includes a clear plastic window). In such situations, the employer must ensure that each employee wears an alternative to protect the employee, such as a face shield, if the conditions permit it.

DRAFT

Similarly, paragraph (f)(1)(iii)(E) contains an exception for employees who cannot wear facemasks due to a medical necessity, medical condition, or disability as defined in the Americans with Disabilities Act (42 USC 12101 et seq.). This exception applies to a narrow group of individuals with severe disabilities for whom wearing a facemask would pose deadly risks. This includes those who would not know to remove their facemasks if they are having difficulty breathing, those who are unable to independently remove their facemasks themselves, or those who cannot communicate promptly to someone else that their facemask must be removed. The remaining portion of the subset who cannot wear a facemask may be exempted on a case-by-case basis. In all such situations, the employer must ensure that each employee wears a face shield for the protection of the employee, if their condition or disability permits it.

Under the final exception, contained in paragraph (f)(1)(iii)(F) of the healthcare section, a facemask is not required for an employee if the employer can demonstrate that the use of such presents a hazard to the employee of serious injury or death (e.g., arc flash, heat stress, interfering with safe operation of equipment). This exception ensures employees remain protected from other potential or known workplace hazards that could lead to injury. In such situations, the employer must ensure that each employee wears an alternative to protect the employee, such as a face shield, if the conditions permit it. OSHA notes that specialized facemasks, or other specialized equipment that does not meet the definition of a facemask in paragraph (b), may be available to protect against the relevant hazard and also allow effective protection against COVID-19. Any employee not wearing a facemask under this exception must remain at least 6 feet away from all other people unless the employer can demonstrate it is not feasible. Finally, under this exception, the employee must resume wearing a facemask when not engaged in the activity where the facemask presents a hazard.

DRAFT

A note to paragraph (f)(1)(iii)(F) states that, with respect to paragraphs (f)(1)(iii)(D)-(F), the employer may determine that the use of a face shield without a facemask, in certain settings, is not appropriate due to other infection control concerns. These infection control concerns, along with the rationale for this note, are discussed in detail in *Need for Specific Provisions* (Section V of the preamble).

**Face shields**

Paragraph (f)(1)(iv) of the healthcare section outlines requirements for face shields used in healthcare. As defined in paragraph (b) of this section, *face shields* are devices, typically made of clear plastic, that (i) are certified to ANSI/ISEA Z87.1, which is incorporated by reference in 29 CFR 1910.509; or (ii) cover the wearer's eyes, nose, and mouth to protect from splashes, sprays, and spatter of body fluids, wrap around the sides of the wearer's face (i.e., temple-to-temple), and extend below the wearer's chin. These specifications are critical design parameters for face shields to effectively contain respiratory droplets and prevent droplet transmission.

Paragraph (f)(1)(iv) first states that when a face shield is required to comply with paragraph (f), or is otherwise required by the employer, the employer must ensure that the face shields are cleaned at least daily and are not damaged. Like facemasks, face shields can become soiled or dirty by splashes, sprays, or spatters, from contact with a contaminated surface, or by touching or adjusting the face shield with contaminated hands. Each time they are worn, face shields can become contaminated with bacteria and viruses, including the virus that causes COVID-19, which poses a risk of transmission to employees upon contact. Additionally, damaged face shields may not fit properly and thus, not meet the required specifications, thereby reducing their effectiveness. Thus, employers must ensure that face shields are regularly cleaned and are not used if damaged.

DRAFT

When an employee provides their own face shield, paragraph (f)(1)(iv) specifies that such face shield must meet the definition in paragraph (b) and the employer is not required to reimburse the employee for that face shield. In order to encourage the voluntary use of face shields, OSHA is not imposing a separate duty on employers to inspect or clean the employee-provided face shields. Because OSHA anticipates that employees choosing to voluntarily bring in their own face shields for extra protection will also wear their face shields outside of work, employees are expected to continue to care for them and provide proper cleaning as necessary. The general availability of cleaning supplies in the workplace, particularly if employer-provided face shields were also available, would be sufficient to allow workers to clean their own personal face shields as appropriate. More significantly, while employer-provided face shields must be thoroughly cleaned and disinfected because they might be shared between employees, this need for cleaning would not apply to personal face shields, which would not be shared.

Inspection is not required because the most likely damage to a face shield (e.g., failure of the head harness or strap, or cracks in the face shield) would render the face shield unusable or be blatantly obvious and employees could revert to an employer-provided face shield, if required.

**Respirators and other PPE**

Paragraphs (f)(2) through (f)(5) of the healthcare section contain requirements addressing the provision and use of respirators and other PPE. Information on why OSHA is requiring the provision and use of respirators in the healthcare section is discussed in greater detail in *Need for Specific Provisions* (Section V of this preamble).

In paragraph (b), the healthcare section defines a *respirator* as a type of PPE that is certified by NIOSH under 42 CFR Part 84 or is authorized under an Emergency Use

DRAFT

Authorization (EUA) by the US Food and Drug Administration (FDA). These specifications are intended to ensure some consistent level of testing, approval, and protection and to prevent the use of counterfeit respirators that will not offer adequate protection, which is important because respirators are intended to protect the wearer when directly exposed to hazards. Respirators protect against airborne hazards by removing specific air contaminants from the ambient (surrounding) air or by supplying breathable air from a safe source. Common types of respirators include filtering facepiece respirators (FFRs), elastomeric respirators, and powered air-purifying respirators (PAPRs). Face coverings, facemasks, and face shields are not respirators.

Paragraph (b) of the healthcare section also contains definitions for the types of respirators referred to in the definition of respirator. A *filtering facepiece respirator* (FFR) is a negative pressure particulate respirator with a non-replaceable filter as an integral part of the facepiece or with the entire facepiece composed of the non-replaceable filtering medium. N95 FFRs are the most common type of FFR and are the type of respirator most often used to control exposures to infections transmitted via the airborne route. When properly worn, N95 FFRs filter at least 95% of airborne particles (CDC, January 11, 2021). An *elastomeric respirator*, also defined in paragraph (b), is a tight-fitting respirator with a facepiece that is made of synthetic or rubber material that permits it to be disinfected, cleaned, and reused according to manufacturer's instructions. Elastomeric respirators are equipped with replaceable cartridges, canisters, or filters. Lastly, a *powered air-purifying respirator* (PAPR) is an air-purifying respirator that uses a blower to force the ambient air through air-purifying elements to the inlet covering. In general, an employer may provide and ensure the use of any of these respirator types to comply with the requirements in paragraphs (f)(2) through (f)(5).

DRAFT

Paragraph (f)(2) of the healthcare section addresses the provision and use of respirators and other PPE for exposure to a person with suspected or confirmed COVID-19, as well as exposure to human remains with suspected or confirmed COVID-19. A detailed discussion of OSHA's rationale for requiring employers to provide and ensure the use of respirators and other PPE for exposure to a person with suspected or confirmed COVID-19 is in the *Need for Specific Provisions* (Section V of the preamble).

Paragraph (f)(2) of the healthcare section also requires two types of PPE whenever employees have "exposure" to a person with suspected or confirmed COVID-19. In this context, exposure refers to close proximity, which includes being within 6 feet or in the same room. As part of its COVID-19 hazard assessment, healthcare employers must assess its facilities and practices and identify areas where employees are reasonably anticipated to be exposed to a person with suspected or confirmed COVID-19. This understanding of exposure is consistent with the process employers are expected to follow under OSHA's Bloodborne Pathogens standard, 29 CFR 1910.1030.

Employers should always anticipate that personnel involved in direct patient care will have exposure when they are treating patients who are suspected or confirmed to have COVID-19. For example:

- Medical examinations, regardless of where they are conducted;
- Medical assistant performing a nasal swab on a patient at a COVID-19 testing location;
- Home health care aide bathing a patient with suspected or confirmed COVID-19 in the patient's home;

DRAFT

- A dental hygienist setting plates in a patient's mouth for x-rays of a patient in a dental office.

In other cases, whether an employer should reasonably anticipate exposure to persons with suspected or confirmed COVID-19 depends on the employee's location and job duties. Thus, for example, employers should anticipate that an employee conducting screening and triage of patients in an emergency room would have exposure to persons with suspected or confirmed COVID-19, as their job involves determining whether patients have symptoms that are consistent with a COVID-19 diagnosis. However, the employer of a receptionist in a physical therapy clinic that has a policy for screening patients or visitors and prohibiting entry to suspected or confirmed COVID-19 cases would not normally anticipate exposure to such people. Likewise, a security guard stationed at the entrance of an emergency room or COVID-19 testing location should anticipate some exposure to visitors with COVID-19, but exposure would not normally be anticipated for a security guard stationed at an employee-only entrance where the employees are regularly screened for COVID-19 symptoms. A few other examples of employees whose anticipation of exposure would vary by job task or locations include the following:

- housekeeping or other healthcare support personnel whose duties involve entry into a room (or enclosed space, such as a partitioned patient area in an emergency room) of a suspected or confirmed COVID-19 patient to exchange laundry, clean, or remove trash.
- a maintenance person who enters the room of a resident with suspected or confirmed COVID-19 patient or changes a light in a hallway while such patients are nearby.
- a nutritionist entering the room of a resident with suspected or confirmed COVID-19 in a nursing home to discuss dietary requirements.

DRAFT

As part of the COVID-19 plan development, employers must take steps to minimize avoidable exposure of employees like janitors and housekeeping personnel to persons with suspected or confirmed COVID-19. For example, employers can implement physical and administrative controls to restrict visitors who are suspected to have COVID-19 to specific areas and away from as many staff as possible. Employers can also designate a limited group of janitors, housekeeping, or maintenance staff to handle all entries into rooms of suspected or confirmed COVID-19 patients and defer maintenance or other services until after the patient has left the room and there is an opportunity for an air exchange. Employers can implement policies restricting the movement of patients who are suspected or confirmed to have COVID-19, keep the doors to their rooms closed, and locate them in specific areas of the facility where there is less likelihood of unexpected interaction with staff.

The types of PPE necessary to reduce employee risks from these exposures are specified in paragraphs (f)(2)(i) and (f)(2)(ii). First, under paragraph (f)(2)(i), the employer must provide a respirator to each employee and ensure that it is provided and used in accordance with OSHA's Respiratory Protection standard (29 CFR 1910.134). Second, under paragraph (f)(2)(ii), the employer must provide gloves, an isolation gown or protective clothing, and eye protection to each employee and ensure that the PPE is used in accordance with OSHA's PPE standard, 29 CFR 1910 Subpart I. The Respiratory Protection standard requires, among other things, that the employer develops and implements a written respiratory protection program with required worksite-specific procedures and elements for required respirator use. The program must include several elements, such as procedures for fit testing and medical evaluations of employees. In any setting covered under the healthcare section where employees are exposed to persons with

DRAFT

known or suspected COVID-19, employers are required to provide and ensure the use of N95 FFRs or higher level respirators and follow all requirements under 29 CFR 1910.134.

The COVID-19 pandemic has had an unprecedented impact on the availability of FFRs, particularly N95 FFRs. While earlier in the pandemic there were shortages and supply chain disruption, more recently, the CDC has acknowledged that the supply and availability of NIOSH-approved respirators have increased significantly over the last several months (CDC, April 9, 2021). Nonetheless, there may be times when employers experience limitations or disruptions to the supply of filtering facepiece respirators. Thus, a note to paragraph (f)(2) provides that, when there is a limited supply of FFRs, OSHA will permit employers to follow the CDC's "Strategies for Optimizing the Supply of N95 Respirators." OSHA will examine whether there is a limited supply of FFRs on a case-by-case basis, and intends this note to apply only for the limited time when there is a limited supply of FFRs. For example, where respirators or associated supplies and services are readily available, this note will not apply. The note to paragraph (f)(2) also encourages employers to select elastomeric respirators or PAPRs instead of FFRs to prevent shortages and supply chain disruption, where possible. Since elastomeric respirators and PAPRs are reusable, they offer the advantage of repeated use by employees, both during and beyond the pandemic. Therefore, employers should evaluate and determine whether elastomeric respirators or PAPRs are suitable for particular tasks prior to using them as alternatives to FFRs. It should be noted that elastomeric respirators and PAPRs have specific use limitations and restrictions that need to be understood when determining whether they are appropriate for specific applications (CDC, October 13, 2020). For example, an elastomeric respirator with an exhalation valve should not be used during surgical procedures due to concerns that air coming out of the valve may contaminate the sterile field (CDC, October 13,

DRAFT

2020).[32] Additionally, PAPRs should not be used in surgical settings due to concerns that the blower exhaust and exhaled air may contaminate the sterile field (CDC, April 9, 2021).

Paragraph (f)(3) of the healthcare section addresses the provision and use of respirators and other PPE during aerosol generating procedures (AGPs), which, under this paragraph, includes AGPs performed on human remains. The healthcare section defines an AGP as a medical procedure that generates aerosols that can be infectious and are of respirable size (i.e., particles of respirable size, <10 μm). AGPs are more likely to generate higher concentrations of potentially infectious respiratory aerosols than coughing, sneezing, talking, or breathing, thereby putting employees performing or assisting in the conduct of AGPs at an increased risk for pathogen exposure and infection relative to conducting tasks or procedures that do not generate such a high concentration of aerosols (CDC, December 17, 2020). Given the risks associated with AGPs, as explained further below, the healthcare section requires the provision and use of respirators and other PPE both when AGPs are performed on a person with suspected or confirmed COVID-19 *and* when they are performed on a person who is *not* suspected or confirmed to have COVID-19. A detailed discussion of OSHA's rationale for requiring employers to provide and ensure the use of respirators and other PPE in these circumstances, including an extended discussion of the requirement for employers to provide and ensure the use of respirators and other PPE when they are performed on a person who is *not* suspected or confirmed to have COVID-19, is in the *Need for Specific Provisions* (Section V of the preamble).

DRAFT

[32] There are some newly designed NIOSH-approved half-mask elastomeric respirators that can not only protect the wearer, but also provide adequate source control by filtering the wearer's exhaled air that may contain harmful viruses or bacteria (NIOSH, March 1, 2021).

Development of a comprehensive list of AGPs for healthcare settings has not been possible due to limitations in available data on which procedures may generate potentially infectious aerosols and the challenges in determining if reported transmissions during AGPs are due to aerosols or other exposures (CDC, January 25, 2021). Furthermore, there is neither expert consensus, nor sufficient supporting data, to create a definitive and comprehensive list of AGPs for healthcare settings (CDC, January 25, 2021). For example, based on limited available data, it is uncertain whether aerosols generated from some procedures, such as nebulizer administration and high flow oxygen delivery, may be infectious. More specifically, aerosols generated by nebulizers are derived from medication in the nebulizer, and it is uncertain whether potential associations between performing this common procedure and increased risk of infection might be due to aerosols generated by the procedure or due to increased contact between those administering the nebulized medication and infected patients (CDC, January 25, 2021).

Therefore, the only medical procedures that are considered AGPs for the purposes of this ETS are: open suctioning of airways; sputum induction; cardiopulmonary resuscitation; endotracheal intubation and extubation; non-invasive ventilation (e.g., BiPAP, CPAP); bronchoscopy; manual ventilation; medical/surgical/postmortem procedures using oscillating bone saws; and dental procedures involving ultrasonic scalers, high-speed dental handpieces, air/water syringes, air polishing, and air abrasion. Examples of procedures that are considered AGPs under the ETS are a dentist or dental hygienist using an ultrasonic scaler on a patient, a nurse intubating a patient, an emergency medical technician (EMT) performing cardiopulmonary resuscitation on a patient; and a coroner or medical examiner using an oscillating bone saw during an autopsy. These and the other commonly performed procedures listed above are considered AGPs because they create uncontrolled respiratory secretions. They are also

DRAFT

consistent with those identified by the CDC as the most common AGPs in healthcare settings, dental settings, and deathcare settings (CDC, January 25, 2021; CDC, December 4, 2020; CDC, December 2, 2020).

The respirator program requirements for performing AGPs vary by setting and are dependent on whether the patient they are performed on is known or suspected to have COVID-19. Generally, compliance with the "full" respiratory protection program in 29 CFR 1910.134 is required for AGPs performed on persons with known or suspected COVID-19, whereas compliance with the "mini" respiratory protection program in 29 CFR 1910.504 is sufficient in other cases.

Paragraph (f)(3)(i) of the healthcare section requires that, for AGPs performed on a person with suspected or confirmed COVID-19, the employer must provide: (A) a respirator to each employee and ensure that it is provided and used in accordance with the Respiratory Protection Standard (29 CFR 1910.134); and (B) gloves, an isolation gown or protective clothing, and eye protection to each employee and ensure that the PPE is used in accordance with the PPE standard (29 CFR 1910 Subpart I). These requirements are similar to those in paragraph (f)(2), discussed above.

Paragraph (f)(3)(ii) of the healthcare section requires that, for AGPs performed on a person who is not suspected or confirmed to have COVID-19, the employer must provide: (A) a respirator to each employee and ensure that it is provided and used in accordance with the mini respiratory protection program section of the ETS (29 CFR 1910.504); and (B) gloves, an isolation gown or protective clothing, and eye protection to each employee and ensure that the PPE is used in accordance with 29 CFR 1910 Subpart I. When healthcare workers could be exposed during AGPs performed on patients who are not known or suspected to have COVID-

DRAFT

19, the employer is required to provide an N95 or higher level respirator but is not required to comply with the full requirements of the respiratory protection program under 29 CFR 1910.134. The employer must, however, comply with the requirements of the mini respiratory protection program section of the ETS (29 CFR 1910.504). A detailed discussion of the mini respiratory protection program section is in the relevant discussion of this *Summary and Explanation* and *Need for Specific Provisions* (Section V of the preamble).

There are two notes to paragraph (f)(3)(i) of the healthcare section. The first note provides that, for AGPs on a person with suspected or confirmed COVID-19, employers are encouraged to select elastomeric respirators or PAPRs instead of FFRs. OSHA included this note in the regulatory text because of the high risk associated with AGPs, especially when they are conducted on persons with suspected or confirmed COVID-19. One recently published article explained why filters certified as 99, 100, or HEPA (high-efficiency particulate air), but not N95s, are appropriate for AGPs. Howard (May 12, 2020) concluded that the correct selection of respirators for AGPs is "of the utmost importance in the current COVID-19 pandemic" because "high-risk aerosol-generating procedures may create aerosolization of high viral loads that represent increased risk to healthcare workers."

PAPRs provide a higher level of respiratory protection than N95 FFRs. PAPRs reduce the aerosol concentration inhaled by the wearer to at least 1/25th of that in the air, compared to a 1/10th reduction for FFRs (CDC, November 3, 2020). Because they provide higher-level respiratory protection than N95 FFRs, the CDC encourages the use of PAPRs during AGPs regardless of the pathogen (i.e., not just for protection against COVID-19) (CDC, November 3, 2020). Furthermore, the CDC encourages the use of PAPRs during autopsy procedures on

DRAFT

deceased persons with COVID-19 due to the likelihood of generation of contagious aerosols during various autopsy procedures (CDC, December 2, 2020).

Elastomeric respirators provide at least the level of respiratory protection as N95 FFRs. Half-mask elastomeric respirators offer the same level of protection as N95 FFRs (i.e., both N95 FFRs and half-mask elastomeric respirators reduce the aerosol concentration inhaled by the wearer to 1/10$^{th}$ of that in the air).[33] Full-face elastomeric respirators provide greater protection because of better sealing characteristics and less face-seal leakage (and also provide protection to more of the face including the eyes) (CDC, October 13, 2020). Full-face elastomeric respirators reduce the aerosol concentration inhaled by the wearer to at least 1/50$^{th}$ of that in the air (CDC, October 13, 2020).

The second note to paragraph (f)(3)(i) is a reminder that additional requirements, besides respirator requirements, specific to AGPs on people with suspected or confirmed COVID-19 are contained in paragraph (g) of the healthcare section. Additional information on paragraph (g) of the healthcare section is discussed later in the *Summary and Explanation*.

Paragraph (f)(4) of the healthcare section addresses the optional use of respirators by employees when not required by the healthcare section. OSHA recognizes that there will be cases where either an employer or an employee believes that protection is needed beyond a facemask, as required by paragraph (f)(1) of the healthcare section. Therefore, under paragraph (f)(4)(i), the employer may upgrade an employee's protection by providing a respirator to the employee when only a facemask is required by paragraph (f)(1) of the section. Per paragraph (f)(4)(ii), where the employer provides the employee with a facemask as required by paragraph

DRAFT

[33] For more information on the minimum level of protection that can be expected from any class of respirator (e.g., FFR, PAPR, half-mask elastomeric respirator) when the respirator is properly selected and used, see NIOSH/OSHA's (May 2015) *Hospital Respiratory Protection Program Toolkit* at https://www.osha.gov/sites/default/files/publications/OSHA3767.pdf.

(f)(1) of the section, the employer must permit the employee to wear their own respirator instead of a facemask. In both circumstances, the employer must comply with the mini respiratory protection program section of the ETS (29 CFR 1910.504). OSHA intends this flexibility, combined with lowered administrative requirements, to encourage more respirator use because properly worn respirators will provide significantly improved protection from COVID-19. Again, for a detailed discussion of the mini respiratory protection program section, please see the relevant discussion in this *Summary and Explanation* and *Need for Specific Provisions* (Section V of the preamble).

Paragraph (f)(5) of the healthcare section addresses the provision and use of respirators and other PPE based on Standard and Transmission-Based Precautions or recognized and generally accepted good biosafety practices. Under the paragraph, the employer must provide PPE (e.g., respirators, gloves, gowns, goggles, face shields) to each employee in accordance with the applicable infection control practices for healthcare or laboratories. In healthcare settings, the PPE must be provided in accordance with Standard and Transmission-Based Precautions, which includes CDC's "Guidelines for Isolation Precautions," which is incorporated by reference into the ETS. In laboratory settings, the PPE must be provided in accordance with recognized good biosafety practices. In both healthcare and laboratory settings, the employer must ensure that the PPE is used in accordance with OSHA's PPE Standard, 29 CFR 1910 Subpart I. OSHA provides a more in-depth explanation and discussion of Standard and Transmission-Based Precautions and recognized good biosafety practices in laboratories in the relevant section of this *Summary and Explanation*, as well as *Need for Specific Provisions* (Section V of the preamble).

DRAFT

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DRAFT

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DRAFT

*Aerosol-generating procedures on suspected or confirmed COVID-19 patients*

As discussed in *Need for Specific Provisions* (Section V of this preamble), aerosol-generating procedures (AGPs) are well known to be high risk activities for exposure to respiratory infections. As such, paragraph (g) of the healthcare section addresses policies and procedures that employers must implement to protect employees who perform AGPs on persons with suspected or confirmed COVID-19. This includes aerosol-generating postmortem procedures because human remains can still produce infectious droplets and particles (i.e., "person" includes "human remains" for the purpose of paragraph (g) of the healthcare section).

As defined in paragraph (b) of the healthcare section, *AGPs* are medical procedures that generate aerosols that can be infectious and are of respirable size (i.e., <10 µm). Moreover, for the purposes of the healthcare section, only the following medical procedures are considered AGPs: open suctioning of airways; sputum induction; cardiopulmonary resuscitation; endotracheal intubation and extubation; non-invasive ventilation (e.g., BiPAP, CPAP); bronchoscopy; manual ventilation; medical/surgical/postmortem procedures using oscillating bone saws; and dental procedures involving ultrasonic scalers, high-speed dental handpieces, air/water syringes, air polishing, and air abrasion. For further information on why these procedures are considered AGPs under the ETS, please see *Need for Specific Provisions* (Section V of this preamble).[34]

If an AGP is performed on a person with suspected or confirmed COVID-19, per paragraph (g)(1) of the healthcare section, the employer must limit the number of employees present during the procedure to only those essential for patient care and procedure support. This will ensure that as few employees as possible are exposed to infectious aerosols.

As noted in *Grave Danger* (Section IV of this preamble), it is well-accepted that COVID-19 may spread through airborne transmission during AGPs. To this end, paragraph (g)(2) of the healthcare section requires that when an AGP is performed on a person with suspected or confirmed COVID-19, the employer must ensure it is performed in an existing airborne infection isolation room (AIIR), if available. An *AIIR*, under paragraph (b) of the healthcare section, is a dedicated negative pressure patient-care room, with special air handling capability, which is used

DRAFT

[34] CDC guidelines recommend avoiding AGPs during postmortem activities if possible. The guidelines also provide that, if aerosol generation is likely and unavoidable (e.g., when using an oscillating saw), appropriate engineering controls and PPE should be used, and that these precautions, combined with the use of Standard Precautions, will help prevent direct contact with infectious material, percutaneous injury, and other hazards related to moving human remains and handling embalming chemicals (CDC, December 2, 2020).

to isolate persons with a suspected or confirmed airborne-transmissible infectious disease. AIIRs include both permanent rooms and temporary structures (e.g., a booth, tent or other enclosure designed to operate under negative pressure). For further discussion on the need for adequate ventilation and AIIRs during AGPs, please see *Need for Specific Provisions* (Section V of this preamble) and the S*ummary and Explanation* for ventilation (paragraph (k)(2) of the healthcare section).

There are a limited number of AIIRs available across the United States, and the COVID-19 pandemic has created added demand for AIIRs (Wilson, April 16, 2020). Based on this, OSHA concludes that the use of AIIRs needs to be prioritized for those persons that present the greatest exposure risk to employees (which, for the purposes of the ETS, means those persons with suspected or confirmed COVID-19). OSHA's decision to require the use of AIIRs only when AGPs are performed on persons with suspected or confirmed COVID-19 is consistent with the CDC's guidance on the use of AIIRs during AGPs (CDC, February 10, 2021).

If an AIIR is not available for an AGP on a person with suspected or confirmed COVID-19 (because, for example, the facility does not have an AIIR), the employer may transfer the patient to a facility with an available AIIR, if feasible. Employers may also consider the use of a ventilated headboard with a canopy if an AIIR is not available. However, if the procedure must be performed in the facility that does not have an available AIIR, the employer should still isolate the person to the extent feasible and distance that person from others when isolation is not feasible. For example, the employer could ensure that the procedure is performed in an isolated area of the facility. Moreover, the employer will need to comply with other provisions of the healthcare section, as well as all other applicable OSHA standards, during the conduct of the procedure (e.g., providing employees with and ensuring they use respirators and other PPE in

DRAFT

accordance with paragraph (f), and complying with requirements for ventilation in paragraph (k), of the healthcare section).

Paragraph (g)(3) of the healthcare section requires that, after an AGP is completed on a person with suspected or confirmed COVID-19, the employer must clean and disinfect the surfaces and equipment in the room or area where the AGP was performed. The employer must also develop and implement policies and procedures in accordance with paragraphs (c) and (j) of the healthcare section to ensure prompt, proper cleaning and disinfection of the surfaces and equipment in the room or area.

Finally, a note to paragraph (g) provides that respirators and other PPE requirements for use during AGPs are contained in paragraph (f)(3) of the healthcare section. This note serves as a cross-reference.

**Aerosol Generating Procedures Summary and Explanation References:**

Centers for Disease Control and Prevention (CDC). (2020, December 2). *Collection and Submission of Postmortem Specimens from Deceased Persons with Confirmed or Suspected COVID-19*. https://www.cdc.gov/coronavirus/2019-ncov/hcp/guidance-postmortem-specimens.html (CDC, December 2, 2020)

Centers for Disease Control and Prevention (CDC). (2021, February 10). *Interim Infection Prevention and Control Recommendations for Healthcare Personnel During the Coronavirus Disease 2019 (COVID-19) Pandemic.* https://www.cdc.gov/coronavirus/2019-ncov/hcp/infection-control-recommendations.html (CDC, February 10, 2021)

Wilson M. (2020, April 16). *Negative pressure rooms save lives. Why aren't there more of them?* Fast Company. https://www.fastcompany.com/90491094/negative-pressure-rooms-save-lives-why-arent-there-more-of-them (Wilson, April 16, 2020)

*Mini Respiratory Protection Program*

Compliance with the mini respiratory protection program section of the ETS (29 CFR 1910.504) is required when employees wear a respirator with no known exposures to suspected or confirmed sources of COVID-19. The mini respiratory protection program is designed to

DRAFT

improve employee protections during the pandemic by streamlining respiratory protection program requirements under the ETS. This program provides a limited set of requirements for the safe use of respirators; these requirements are meant to be easier and quicker to implement than the more comprehensive respiratory protection program under 29 CFR 1910.134. OSHA designed the mini respiratory protection program to allow employers and employees increased flexibility in selecting respirators while ensuring that employees remain protected. The rationale for including the mini respiratory protection program section in the ETS is discussed in more detail in the *Need for Specific Provisions* (Section V of the preamble).

Paragraph (a) establishes that the mini respiratory protection program section applies only to respirator use in accordance with specific provisions of paragraph (f)(5) of the general section and paragraphs (f)(3)(ii) and (f)(4) of the healthcare section. In any other situation where respirator use is required under the ETS (or another OSHA standard), the employer must follow the requirements in OSHA's respiratory protection standard, 29 CFR 1910.134. This includes when respirator use is required in the healthcare section, specifically under paragraph (f)(2)(i) for exposure to people with suspected or confirmed COVID-19; under paragraph (f)(3)(i)(A) for aerosol-generating procedures performed on a person with suspected or confirmed COVID-19; under paragraph (f)(5) based on Standard and Transmission-Based Precautions or recognized good biosafety practices; and where respirator use is required for protection from any hazards other than COVID-19.

Under paragraph (f)(5) in the general section, employers must comply with the mini respiratory protection program section when they elect to provide a respirator to an employee or permit an employee to wear their own respirator instead of a face covering. Similarly, paragraph (f)(4)(i) of the healthcare section requires employers to comply with the mini respiratory

DRAFT

protection program section when they elect to provide a respirator to an employee instead of a facemask. Employers must follow the mini respiratory protection program section when they permit an employee to wear their own respirator instead of a facemask, as required by paragraph (f)(4)(ii) of the healthcare section.

Finally, paragraph (f)(3)(ii)(A) of the healthcare section requires the employer to provide a respirator to each employee and ensure that it is used in accordance with the mini respiratory protection program section when aerosol-generating procedures (AGPs) are performed on a person who is not suspected or confirmed to have COVID-19. For example, when a dental hygienist is using an ultrasonic scaler to clean a patient's teeth or a nurse is performing an open suctioning of a patient's airway, the employer is required to provide a respirator and comply with the mini respiratory protection program section when the patient is not suspected or confirmed to have COVID-19. In contrast, when the same AGPs (using an ultrasonic scaler to clean a patient's teeth; performing open suctioning of a patient's airway) are performed on a person with suspected or confirmed COVID-19, 29 CFR 1910.134 applies to the required use of respirators. Allowing employers to follow the mini respiratory protection program section when providing a respirator during AGPs on patients who are not suspected or confirmed to have COVID-19 will address the difficulty some employers (e.g., dentists) would face in quickly implementing full respiratory protection programs under 29 CFR 1910.134 if they do not already have those programs in place. Ensuring that employees are provided N95s or higher level respirators, instead of facemasks, and that the employees are trained to do a user seal check before each use, will improve protection for employees who perform AGPs on patients who are not known or suspected to have COVID-19. OSHA expects, moreover, that this approach will increase compliance with the requirement to provide respirators under paragraph (f)(3)(ii)(A) of the

DRAFT

healthcare section because employers will be more likely to provide N95s or higher level respirators to their employees if they are not also required to implement a full respiratory protection program under 29 CFR 1910.134.

Paragraph (b) of the mini respiratory protection program section contains the definitions used in that section. Most of the definitions have already been discussed in the sections of the preamble devoted to the general and healthcare sections. The previously discussed definitions are COVID-19, elastomeric respirator, filtering facepiece respirator, respirator, and powered air-purifying respirator (PAPR). The definitions of hand hygiene, tight-fitting respirator, and user seal check are explained below, where paragraph (d)(2) is discussed.

Paragraph (c) of the mini respiratory protection program section applies to respirators provided by employees, as opposed to employer-provided respirators. When the employer permits an employee to use their own respirator under the provisions of paragraph (f)(5) of the general section or paragraph (f)(4)(ii) of the healthcare section, the employer must provide the employee with a specific notice, the text of which is included in paragraph (c) of the mini respiratory protection program section. The notice is similar to the notice provided to employees for voluntary respirator use under 29 CFR 1910.134 Appendix D. It explains that respirators can provide effective protection against COVID-19 hazards when properly selected and worn, but notes that a respirator can itself become a hazard if used improperly or not kept clean. The notice also instructs employees to read and follow the respirator manufacturer's instructions and warnings and to ensure that they do not mistakenly use another person's respirator. Further, the notice tells employees that if they need a respirator for a non-COVID-19 hazard, such as a chemical hazard, then their employer must provide them with a respirator and ensure that it is used in accordance with 29 CFR 1910.134. Employers that must comply with this paragraph

DRAFT

have substantial flexibility in how they provide the information to the employee. The agency expects that most employers will simply provide the information in written form, either through a printed page of information or electronically through a company e-mail system. Employers could also deliver the information orally through a training session

Paragraph (d) of the mini respiratory protection program section applies to employer-provided respirators, in contrast to employee-provided respirators. Paragraph (d) applies whenever employers provide respirators to their employees under paragraph (f)(5) of the general section, or paragraphs (f)(3)(ii)(A) or (f)(4)(i) of the healthcare section. The use of FFRs, elastomeric respirators, and PAPRs is covered under paragraph (d), although a small number of individual provisions apply only to particular categories of respirators (e.g., paragraph (d)(3)(i) of the respiratory protection program section applies only to FFRs).

Paragraph (d)(1) of the mini respiratory protection program section requires employers to ensure that each employee wearing a respirator receives training prior to first use of the respirator and whenever the employee begins using a different type of respirator. Employee training is an essential component of any OSHA standard, and is needed so employees understand the requirements of the standard and what must be done to keep them safe. In keeping with other OSHA training requirements, the training must be given in a language and at a literacy level the employee understands. The training must result in employee comprehension of how to inspect, put on, use, and remove the respirator. The employee must also understand the limitations and capabilities of the respirator, including limitations when the respirator has not been fit tested. Because employees are not required to be fit tested under the mini respiratory protection program section as they are under 29 CFR 1910.134, a key aspect of this portion of the training is to emphasize that without a fit test, an employer has less control over whether

DRAFT

employees are receiving the full, expected level of protection that a respirator is capable of providing to the wearer. In the absence of a fit test, the employer should inform the employee that a user seal check is very important to determining whether the respirator is properly placed on their face in order to allow the respirator to function as intended. After the training is provided, the employee must also comprehend the proper way to store, maintain, and inspect the respirator; how to perform a user seal check; and how to recognize medical signs and symptoms that may limit or prevent the effective use of the respirator, along with what to do if the employee experiences those signs and symptoms.

Employers have substantial flexibility regarding the format in which training is provided under the mini respiratory protection program section of this ETS. The training can be provided along with the other training required under paragraph (k) of the general section or paragraph (n) of the healthcare section (whichever is applicable), or it can be provided separately. Training may be provided in-person, remotely through online training, or by distributing educational materials. The requirement for employee comprehension of the training materials does not require a formal test and may be assessed in other ways so long as the employer can ensure that the requirement for comprehension has been met. Employers looking for training resources on respiratory protection can consult OSHA's website for materials and information.

Paragraph (d)(2) of the mini respiratory protection program section requires the employer to ensure that each employee who uses a tight-fitting respirator performs a user seal check each time they put on the respirator. A *tight-fitting respirator* is defined as a respirator in which the air pressure inside the facepiece is negative during inhalation with respect to the ambient air pressure outside the respirator (e.g., filtering facepiece). Tight-fitting respirators include all FFRs (e.g., N95s) and most elastomeric respirators, and under paragraph (d)(2) of the mini respiratory

DRAFT

protection program section, they require a user seal check. Many PAPRs used in healthcare settings are loose-fitting and therefore do not require a user seal check. *User seal check* is defined as an action conducted by the respirator user to determine if the respirator is properly seated to the user's face. A user seal check ensures an adequate seal is achieved, and can be conducted by either a positive pressure or negative pressure check. Finally, *hand hygiene* is defined as the cleaning and/or disinfecting of one's hands by using standard handwashing methods with soap and running water or an alcohol-based hand rub. Alcohol-based hand rub must contain at least 60% ethanol or 70% isopropanol. As specified in the definition, handwashing with soap and running water is preferable to the use of alcohol-based hand rubs.

Under paragraph (d)(2) of the mini respiratory protection program section, employers must ensure that employees perform a user seal check each time a tight-fitting respirator is put on. This requirement is meant to ensure that the respirator is properly seated on the user's face (i.e., that the proper seal has been achieved) whenever they are wearing it. Performing a user seal check helps ensure that the respirator is sealed to the employee's face and therefore that air is not leaking around the edges of the respirator instead of flowing through the filtering media. Paragraphs (d)(2)(i)(A) and (B) of the mini respiratory protection program section explain methods for conducting positive pressure and negative pressure seal checks. Both methods require, as the first step, that the employee conducts proper hand hygiene and properly dons their respirator. As described in paragraph (d)(2)(i)(A), the proper method for conducting a positive pressure user seal check is to have the employee exhale into the respirator while covering the filter surface with their hands. If there is no evidence of leaks and the employee can feel a slight outward pressure on the surface of the respirator, proper fit has likely been achieved and the fit is considered satisfactory. The proper method for performing a negative pressure user seal check,

DRAFT

under paragraph (d)(2)(i)(B), is to have the employee inhale while covering the filter surface with their hands. Proper fit has likely been achieved, and the fit is considered satisfactory, if the respirator collapses on the face and the employee does not feel air passing between their face and the facepiece of the respirator. Paragraph (d)(2)(ii) of the mini respiratory protection program section requires the employer to ensure that the employee corrects any seal problems discovered during the user seal check by readjusting how the respirator sits on the employee's face, readjusting the nosepiece, if applicable, and readjusting the straps along the sides of the head.

When an employee is required to wear a respirator and a problem with the seal check arises due to interference with the seal by an employee's facial hair, a note to paragraph (d)(2)(ii) of the mini respiratory protection program section reminds employers that they may provide a different type of respirator to accommodate an employee who cannot trim or cut facial hair due to their religious beliefs. In such cases, if the employee cannot achieve a seal with a FFR or elastomeric respirator, a loose-fitting PAPR may be the only alternative that provides effective protection.

Paragraph (d)(3) of the mini respiratory protection program section describes the requirements employers must follow for reuse of respirators that are provided by the employer, with specific requirements for FFRs (paragraph (d)(3)(i)) and for elastomeric respirators and PAPRs (paragraph (d)(3)(ii)). Reuse of respirators has been necessary in some cases during the COVID-19 pandemic, particularly at the beginning of the pandemic when shortages of respirators were most acute. When respirators are reused, it is important that proper procedures are followed and that reuse is limited to ensure they continue to effectively protect the user.

Paragraph (d)(3)(i) of the mini respiratory protection program section describes the requirements for reuse of FFRs. FFRs are designed and manufactured as disposable items of

DRAFT

personal protective equipment that should normally be discarded after a single use. Therefore, the note to paragraph (d)(3)(i) states that reuse of single-use respirators is discouraged. Decontamination and reuse of FFRs used under this section, however, poses less of a concern than reuse of respirators used in other situations, given that there should be no suspected or confirmed sources of COVID-19 present when such reuse occurs. Even so, it is important that reuse of FFRs is permitted only under the conditions set out in paragraph (d)(3)(i).

There are several requirements for the reuse of FFRs under paragraph (d)(3)(i) of the mini respiratory protection program section. The employer must ensure that an FFR is only reused by one employee, and that it is only reused when not visibly soiled or damaged. The employer must ensure that the employee visually checks the respirator's fabric and seal for damage in adequate lighting. In addition, the employer must ensure that the employee completes the user seal check (as described in paragraph (d)(2) of the same section) before each use. As explained earlier, the user seal check is needed to ensure the respirator is properly seated on the user's face. The employer must also ensure that the employee uses proper hand hygiene before putting on their respirator and conducting the user seal check. Proper hand hygiene will help keep the respirator clean and avoid the transmission of potentially infectious material from the employee's hands to the respirator.

The employer must ensure that each FFR reused in accordance with paragraph (d)(3)(i) of the mini respiratory protection program is not worn for more than five days, in total. This limit is generally consistent with CDC guidance, which recommends that, in the absence of guidance from the manufacturer, reuse be limited to no more than five uses per device to ensure adequate respirator performance (CDC, February 10, 2021). The CDC's technical literature regarding how to ensure safe reuse of an FFR discusses the number of times a user may don a single FFR, as

DRAFT

well as variability among FFRs made by different manufacturers. Given these factors, OSHA has set the limit at five days to provide flexibility and improve the feasibility of the standard, while ensuring employees remain protected. It should also be noted that the inspection of the respirator, as well as the user seal check, both of which must be performed by the employee each time a respirator is put on, provide additional safeguards to ensure the respirator is still in proper condition for reuse. It is also important that employers track usage to ensure that each respirator is discarded after five days of use. One way to do so is to attach a small tag to a respirator strap and mark it after each day's use. Similarly, a tag could be attached to the respirator's storage bag to track total use, or the information could be written directly on a paper bag.

Finally, under paragraph (d)(3)(i) of the mini respiratory protection program, employers must also ensure that each reused respirator is stored in a breathable container, such as a paper bag or hard container with air holes, for at least five calendar days between use. This provides time for pathogens that may be on the respirator to "die off" during storage and avoids exposing the employee to those pathogens during subsequent usage. The respirator must also be stored in a dry place to avoid exposure to water and moisture, which could deform the respirator and lead to poor fit.

Combining the five-day total use limitation with the five-day rest requirement, the employer could direct the employee to wear one FFR each day and store it in a breathable paper bag at the end of each day, rotating to the next respirator each day. This strategy requires a minimum of five FFRs per five-day period per employee and an effective and user-friendly tracking system to make sure that each respirator is used in the proper sequence. The five respirators, each used five times, would provide respiratory protection for the employee for 25 days. More information on FFR reuse is available from the CDC (October 19, 2020).

DRAFT

Paragraph (d)(3)(ii) of the mini respiratory protection program section contains the requirements employers must comply with when employees are reusing elastomeric respirators and PAPRs that are provided by the employer. Reusing these respirators is much simpler than reusing FFRs because elastomeric respirators and PAPRs are designed for reuse and made of more durable materials. The employer must ensure that the respirator is not damaged, which will be identified when the employee inspects the respirator before each use. The respirator must be cleaned and disinfected as often as necessary to be maintained in a sanitary condition following the requirements of 29 CFR 1910.134 Appendix B-2. Further, the employer must implement a change schedule for filter cartridges, canisters, or filters that is consistent with the manufacturer's recommendations. For more information about reuse of elastomeric respirators and PAPRs during the pandemic, refer to the CDC Guidance for Contingency and Crisis Strategies (CDC, October 13, 2020; CDC, November 3, 2020, respectively).

Finally, paragraph (d)(4) of the mini respiratory protection program section requires the employer to ensure that an employee discontinues use of a respirator if the employee or supervisor reports medical signs or symptoms related to the employee's ability to use a respirator. These signs and symptoms include shortness of breath, coughing, wheezing, or chest pain. They also include any signs or symptoms related to problems associated with lung or cardiovascular function. If an employee has had a previous medical evaluation that determined they were medically unfit for respirator use, the employer must not provide them with a respirator until they are re-evaluated and medically cleared to use a respirator. These provisions are necessary because the medical evaluation that would normally be required by the 29 CFR 1910.134 respiratory protection standard is not required in the mini respiratory protection

DRAFT

program section, and it is important to ensure that employee health is not compromised by respirator use.

Paragraph (e) contains the effective and compliance dates for the mini respiratory protection program. They are consistent with the dates for the face covering, facemask, and respirator requirements in the general and healthcare sections of the ETS. The mini respiratory protection program section becomes effective on the date of publication, and employers are required to comply with all requirements of the section within 14 days of publication. For more information on compliance dates, please see the *Summary and Explanation* on Dates (Section VIII of this preamble).

**Mini Respiratory Protection Program Summary and Explanation References:**

Centers for Disease Control and Prevention (CDC). (2020, October 13). *Elastomeric respirators: conventional, contingency, and crisis strategies.* https://www.cdc.gov/coronavirus/2019-ncov/hcp/elastomeric-respirators-strategy/index.html. (CDC, October 13, 2020)

Centers for Disease Control and Prevention (CDC). (2020, October 19). *Implementing Filtering Facepiece Respirator (FFR) Reuse, Including Reuse after Decontamination, When There Are Known Shortages of N95 Respirators.* https://www.cdc.gov/coronavirus/2019-ncov/hcp/ppe-strategy/decontamination-reuse-respirators.html#print (CDC, October 19, 2020)

Centers for Disease Control and Prevention (CDC). (2020, November 3). *Powered air purifying respirators (PAPRs).* https://www.cdc.gov/coronavirus/2019-ncov/hcp/ppe-strategy/powered-air-purifying-respirators-strategy.html. (CDC, November 3, 2020)

Centers for Disease Control and Prevention (CDC). (2021, February 10). *Strategies for optimizing the supply of N95 respirators.* https://www.cdc.gov/coronavirus/2019-ncov/hcp/respirators-strategy/index.html. (CDC, February 10, 2021)

*Severability*

The severability clause under 29 CFR 1910.505 of this ETS serves two purposes. First, it expresses OSHA's intent that if any section or provision of the ETS is held invalid or unenforceable or is stayed or enjoined by any court of competent jurisdiction, the remaining sections or provisions should remain effective and operative. Second, the severability clause also

DRAFT

serves to express OSHA's judgment, based on its technical and scientific expertise, that each individual section and provision of the ETS can continue to sensibly function in the event that some sections or provisions are invalidated, stayed, or enjoined.

Under the principle of severability, a reviewing court will generally presume that an offending provision of a regulation is severable from the remainder of the regulation, so long as that outcome appears consistent with the issuing agency's intent, and the remainder of the regulation can function sensibly without the offending provision. *See K Mart Corp. v. Cartier, Inc.*, 486 U.S. 281, 294 (1988) (invalidating and severing subsection of a regulation where it would not impair the function of the statute as a whole and there was no indication the regulation would not have been passed but for inclusion of the invalidated subsection); *Virginia v. EPA*, 116 F.3d 499, 501 (D.C. Cir. 1997) (same); *Davis Cnty. Solid Waste Mgmt. v. EPA*, 108 F.3d 1454, 1459-60 (D.C. Cir. 1997) (same). The principle of severability has always applied to OSHA's standards, including OSHA's prior ETSs, and reviewing courts have regularly severed invalid provisions, or prohibited invalid applications, of both OSHA's permanent and emergency standards, while allowing the remainder of the standards to continue in effect. *See e.g.*, *Am. Dental Ass'n v. Martin*, 984 F.2d 823, 830–31 (7th Cir. 1993) (affirming and allowing most of OSHA's bloodborne pathogens standard to take effect while vacating application of the standard to certain employers); *United Steelworkers of Am., AFL-CIO-CLC v. Marshall*, 647 F.2d 1189, 1311 (D.C. Cir. 1980) (affirming and allowing most of OSHA's lead standard to take immediate effect while staying application of the standard to certain industries pending further agency action); *Dry Color Mfrs. Ass'n, Inc. v. Dep't of Labor*, 486 F.2d 98, 108-09 (3d Cir. 1973) (vacating and remanding OSHA's ETS on carcinogens as to only 2 of 14 regulated chemicals, allowing ETS to take effect as to remaining 12 chemicals); *cf. N. Am.'s Bldg. Trades Unions v.*

DRAFT

*OSHA*, 878 F.3d 271, 309 (D.C. Cir. 2017) (affirming and allowing all of OSHA's silica standard to take effect while remanding for reconsideration of decision not to require broader medical removal protection provisions).

With respect to this ETS, it is OSHA's intent that all provisions and sections be considered severable. In this regard, the agency intends that: (1) in the event that any provision within a section of the ETS is stayed, enjoined, or invalidated, all remaining provisions within that section shall remain effective and operative; (2) in the event that any whole section of the ETS is stayed, enjoined, or invalidated, all remaining sections shall remain effective and operative; and (3) in the event that any application of a provision or section is stayed, enjoined, or invalidated, the provision or section shall be construed so as to continue to give the maximum effect to the provision or section permitted by law. Although OSHA always intends for a presumption of severability to be applied to its standards, the agency has opted to include an explicit severability clause in this ETS to remove any potential for doubt as to its intent. OSHA determined that such clarity is useful here given the unique nature of this emergency rulemaking proceeding, the unprecedented hazard at issue, and the urgent need for implementation of this ETS without delay. Having identified a grave danger to employees that requires immediate emergency rulemaking (Section IV of the preamble), it is OSHA's intent to have as many protective measures in place as quickly as possible to begin to reduce the hazard of exposure to COVID-19 in the workplace. Thus, should a court of competent jurisdiction determine that any provision or section of this ETS is invalid on its face or as applied, the court should presume that OSHA would have issued the remainder of the ETS without the invalidated provision(s) or application(s). Similarly, should a court of competent jurisdiction determine that any provision, section, or application of this ETS is required to be stayed or enjoined, the court should presume

DRAFT

that OSHA intends for the remainder of the ETS to take effect as specified in the rule. *See Casa de Maryland, Inc. v. Wolf*, 2020 WL 5500165, at *33 (D. Md. Sept. 11, 2020) (noting that existence of a severability clause creates a presumption that the agency did not intend the validity of the remaining rules to depend on the validity of the offensive provision and thus without strong evidence to the contrary objectionable provision should be severed); *Consumer Fin. Prot. Bureau v. The Mortg. Law Grp., LLP*, 182 F. Supp. 3d 890, 894-95 (W.D. Wis. 2016) (finding severability clause a clear expression of agency intent and therefore severing specific offending requirements within an otherwise valid provision); *cf. Alaska Airlines, Inc. v. Brock*, 480 U.S. 678, 686 (1987) (holding that inclusion of a severability clause in a statute creates a presumption of Congress's intent).

It is also OSHA's position, based on its technical and scientific expertise, that each of the provisions and sections of the ETS can continue to function sensibly in the event that any specific provisions, sections, or applications are invalidated, enjoined, or stayed. As explained in greater detail in *Need for Specific Provisions* (Section V of this preamble), and specifically in the subsection *Introduction – Effective Infection Prevention Utilizes Overlapping*, the best available evidence shows that each control measure required by this ETS is important both individually and collectively to protect employees from the grave danger of COVID-19. The ETS requires employers to implement multiple infection control measures together because an infection control program is most effective when it utilizes a suite of overlapping controls in a layered approach. This ensures that no inherent weakness in any one measure will result in an infection incident. As noted in Section V of the preamble, this is commonly referred to as the "Swiss Cheese Model of Accident Causation," which recognizes that each control has certain weaknesses or "holes," and that by stacking several controls together with different weaknesses,

DRAFT

the "holes" are blocked by the strengths of the other controls. However, while these control measures work best when used together, each individual measure will still independently result in some reduction of risk to employees, regardless of the implementation of any other measure. Indeed, to the extent any individual measures are not implemented, the remaining measures become increasingly more important as a means of reducing the hazard of COVID-19 to which employees are exposed. Accordingly, if a court of competent jurisdiction were to invalidate, enjoin, or stay any protections required by this ETS, the remaining protections would still serve to reduce the risk of employee exposure to COVID-19—becoming more important in that role absent the invalidated, enjoined, or stayed provisions—and, therefore, should be allowed to take effect. Moreover, as described in greater detail in *Technological Feasibility* (Section VI of the preamble), each of the individual protective measures required by this ETS is capable of being implemented independent of all other measures. While OSHA has emphasized throughout this rule that a multilayered approach is intended for the ETS, the various requirements imposed by this ETS are not required to rise or fall as a whole.

OSHA notes that 29 CFR 1910.504, the mini respiratory protection program, applies only to respirator use in accordance with specific provisions of the general and healthcare sections of the ETS. Thus, in the event that all of those specific provisions in both the general and healthcare sections of the ETS are simultaneously stayed, enjoined, or invalidated, the mini respiratory protection program could also be stayed, enjoined, or invalidated, as it cannot function sensibly in that context. However, if any of the provisions to which the mini respiratory protection program applies remain in effect, the mini respiratory protection program the mini respiratory protection program should also remain in effect.

DRAFT

The severability clause contained in the ETS is included to make clear OSHA's intent that the general presumption of severability should be applied to this standard. The clause is further included to make clear that, in the agency's scientific and technical judgment, the severance of any provisions, sections, or applications of this ETS will not undercut the structure or function of the rule more broadly. Consequently, in the event that a court of competent jurisdiction stays, enjoins, or invalidates any provision, section, or application of this ETS, the remainder of the rule should be allowed to take effect, particularly given the urgent need to address the grave danger COVID-19 poses to employees.

*Incorporation by Reference*

OSHA's ETS incorporates by reference a number of consensus standards and evidence-based guidelines. Those documents, which are listed below, will all be fixed in time and made publicly available. To aid readers in locating the publicly available copies of those documents, OSHA has created a new centralized incorporation by reference (IBR) section 29 CFR 1910.509 that is specific to the ETS provisions in subpart U of 29 CFR 1910. For the benefit of the reader and for administrative convenience, this centralized IBR section is located in the same subpart. If the ETS is not made permanent, 29 CFR 1910.509 will expire along with the rest of the Subpart U. If the ETS is made permanent, OSHA intends to recodify the standards from 29 CFR 1910.509 into 29 CFR 1910.6, the centralized IBR section for part 1910.

In this new section, OSHA is including a list of the title, edition/version, and year of the incorporated documents. Stakeholders may consult 29 CFR 1910.509 both to locate all of the documents incorporated by reference in subpart U (the paragraph in which the document is incorporated is listed there) and to find more details regarding how to locate the specific consensus standard and guidelines that have been incorporated by reference in the ETS.

DRAFT

OSHA recognizes that the Center for Disease Control and Prevention (CDC) and the Environmental Protection Agency (EPA) may update their guidelines based on the most current available scientific evidence, but OSHA is only requiring compliance with the standards or guidelines incorporated by reference, which are fixed in time at the point of publication. OSHA notes that the ETS largely tracks CDC guidance, some of which is labeled as recommendations or guidance and is not always expressed in mandatory terms. As discussed in the *Need for the ETS* (Section IV of this preamble), non-mandatory guidance has not proven to be an effective alternative to a mandatory standard in addressing the pandemic. The CDC has very limited regulatory authority, so nearly all of its materials are framed in non-mandatory terms, including the documents incorporated by reference in this ETS. Nevertheless, as discussed in detail elsewhere in this preamble, OSHA has reviewed those materials and determined that compliance with the safety measures and specific instructions in the CDC materials is important to protect workers. OSHA is concerned that converting these hundreds of pages into regulatory text would be cumbersome and make the ETS more difficult for employers and employees to understand and comply with. Moreover, OSHA believes that many employers and employees are already familiar with existing CDC materials and thus incorporation by reference will therefore facilitate compliance. Therefore, while OSHA is incorporating those materials by reference, compliance with the recommendations will be mandatory. OSHA will be able to cite employers who do not follow them. Compliance with all applicable provisions of the incorporated document is required where the provisions into which they are incorporated are mandatory, whether the incorporated document sets out its directions in mandatory language or recommendations. However, employer compliance with updated versions of the relevant CDC and EPA guidelines

DRAFT

that are at least as protective as the incorporated versions will not amount to more than a *de minimis* violation of the standard under OSHA's longstanding enforcement policy.

OSHA is incorporating by reference (in 29 CFR 1910.509) the materials below. A brief description of each consensus standard and guideline is provided in the text below. A description of their use can be found in the Regulatory Text, and *Summary and Explanation of the ETS* (Section VIII of this preamble), where the standards and guidelines are referenced.

*Regulatory Text -- § 1910.501(b); 1910.502(b)*

ANSI/ISEA Z87.1 (2010, 2015, and 2020) Occupational and Educational Personal Eye and Face Protection Devices: These consensus standards, versions dated 2010, 2015 and 2020, provides criteria and requirements for selection, use, and maintenance of the different face and eye protectors to eliminate hazards such as liquid splash and droplets exposures in occupational and educational environments. The 2010 version was updated in 2015 and 2020 to add new and innovative designs and streamline language. These consensus standards are available for purchase at https://webstore.ansi.org/

*Regulatory Text -- § 1910.501(g)(2); 1910.502(j)(2)(ii)*

CDC's Cleaning and Disinfecting Guidance (2021): This guidance provides direction on cleaning and disinfecting frequently touched surfaces, materials, and equipment regularly or when contaminated by a person who is COVID-positive using appropriate disinfectants and other equipment. This document is available at www.osha.gov/coronavirus/ets/ibr.

*Regulatory Text -- § 1910.502(d)(3); 1910.502(j)(1)*

CDC's COVID-19 Infection Prevention and Control Recommendations (2021): This guidance provides recommendations for routine infection prevention and control practices in

DRAFT

healthcare settings to protect health care workers. This document is available at www.osha.gov/coronavirus/ets/ibr.

*Regulatory Text -- § 1910.502(e)(1); 1910.502(f)(6)*

CDC's Guidelines for Isolation Precautions (2007, Updated 2019): These guidelines provide direction on developing, implementing, and evaluating infection control programs for healthcare settings across a variety of care. It also provides guidance on reducing the prevalence of hospital-acquired infections. This document is available at www.osha.gov/coronavirus/ets/ibr].

*Regulatory Text -- § 1910.502(j)(1)*

CDC's Guidelines for Environmental Infection Control (2019): These guidelines provide evidence-based strategies for the prevention of environmentally mediated infection among healthcare workers and immunocompromised patients. Pages 86-103 and 147-149 focus on Environmental Services in healthcare settings. This document is available at www.osha.gov/coronavirus/ets/ibr.

*Regulatory Text -- § 1910.501(i)(6); 1910.502(l)(6)*

CDC's Isolation Guidance (2021): This guidance provides steps to take when someone experiencing COVID-19 symptoms and/or tested positive for COVID-19. This document is available at www.osha.gov/coronavirus/ets/ibr.

*Regulatory Text -- § 1910.501(i)(6)*

CDC's Isolation Discontinuation Non-Healthcare Guidance (2020): This guidance provides information for healthcare providers and public health officials managing persons with COVID-19 under isolation who are not in healthcare settings (e.g., at home, in a hotel, dormitory room). This document is available at www.osha.gov/coronavirus/ets/ibr.

DRAFT

*Regulatory Text -- § 1910.502(l)(6)*

CDC's Return to Work Healthcare Guidance (2020): These guidelines provide guidance for occupational and public health professionals to develop policies to determine when an employee can return to work after quarantine and/or isolation in healthcare settings. This document is available at www.osha.gov/coronavirus/ets/ibr.

EPA's List N (2020): The products listed in this list meet EPA's criteria for use against SARS-CoV-2 (COVID-19) to clean and disinfect surfaces. This document is available at www.osha.gov/coronavirus/ets/ibr].

Copies of the consensus standards are available for purchase from the issuing organizations at the addresses or through the other contact information listed in Section 1910.509. The CDC and EPA documents are available at no cost through the contact information listed above. In addition, in accordance with § 1910.509(a)(2), these standards are available for inspection at any Regional Office of the Occupational Safety and Health Administration (OSHA), or at the OSHA Docket Office, U.S. Department of Labor, 200 Constitution Avenue NW, Room N-3508, Washington, DC 20210; telephone: 202-693-2350 (TTY number: 877-889-5627). Due to copyright issues, OSHA cannot post consensus standards on the OSHA website or through www.regulations.gov.

DRAFT

**List of Subjects**

**29 CFR Part 1910**

COVID-19, Disease, Health facilities, Health, Healthcare, Incorporation by reference, Occupational health and safety, Public health, Quarantine, Reporting and recordkeeping requirements, Respirators, SARS-CoV-2, Telework, Vaccines, Viruses

**29 CFR Parts 1915, 1917, 1918, 1926, and 1928**

COVID -19, Disease, Health facilities, Health, Healthcare, Occupational health and safety, Public health, Quarantine, Reporting and recordkeeping requirements, Respirators, SARS-CoV-2, Telework, Vaccines, Viruses.

**Authority and Signature**

James S. Frederick, Deputy Assistant Secretary of Labor for Occupational Safety and Health, U.S. Department of Labor, authorized the preparation of this document pursuant to [TO BE INSERTED BY SOL].

Signed at Washington, DC, on _____, 2021.

_____

**James S. Frederick,**
*Principal Deputy Assistant Secretary of Labor for Occupational Safety and Health.*

DRAFT

For the reasons set forth in the preamble, chapter XVII of title 29 of the Code of Federal Regulations is amended as follows:

**PART 1910—OCCUPATIONAL SAFETY AND HEALTH STANDARDS**

1. Add subpart U to read as follows:

**Subpart U — COVID-19 Emergency Temporary Standard**

Subpart U TOC

1910.501 General

1910. 502 Healthcare and Associated Industries

1910.503 [reserved]

Mini Respiratory Protection Program

1910.504 Mini Respiratory Protection Program

Severability

1910.505 Severability

Incorporation by Reference

1910.509 Incorporation by Reference

**Authority:** 29 U.S.C. 653, 655, and 657; Secretary of Labor's Order No. 8-2020 (85 FR 58393); 29 CFR part 1911; and 5 U.S.C. 553.

**§ 1910.501 General.**

(a) *Scope and application*. This section applies to all employers and places of employment except:

(1) Where there is only one employee at the workplace and no other people are in the workplace.

(2) Employees while working from home.

(3) Settings covered by § 1910.502 (e.g., healthcare, long term care, emergency response, mortuary services, biomedical laboratory operations).

Note to paragraph (a): Nothing in this section is intended to limit state or local government mandates or guidance (e.g., executive order, health department order) that go beyond the requirements and are not inconsistent with this section.

(b) *Definitions*. The following definitions apply to this section:

*Assistant Secretary* means the Assistant Secretary of Labor for Occupational Safety and Health, U.S. Department of Labor, or designee.

*Clean/cleaning* means the removal of dirt and impurities, including germs, from surfaces using soap and water or other cleaning agents. Cleaning alone does not kill germs.

DRAFT

*Close contact* means being within 6 feet of another person for a cumulative total of 15 minutes or more over a 24-hour period during that person's potential period of transmission. The potential transmission period runs from 2 days before the person felt sick (or, for asymptomatic people, 2 days prior to test specimen collection) until the time the person is isolated.

*COVID-19 (Coronavirus Disease 2019)* means the respiratory disease caused by SARS-CoV-2 (severe acute respiratory syndrome coronavirus 2). For clarity and ease of reference, this section refers to "COVID-19" when describing exposures or potential exposures to SARS-CoV-2.

*COVID-19 positive* and *confirmed COVID-19* refer to a person who has a confirmed positive test for, or who has been diagnosed by a licensed healthcare provider with, COVID-19.

*COVID-19 symptoms* mean the following: fever or chills; cough; shortness of breath or difficulty breathing; fatigue; muscle or body aches; headache; new loss of taste or smell; sore throat; congestion or runny nose; nausea or vomiting; diarrhea.

*COVID-19 test* means a test for SARS-CoV-2 that is:

(i) Cleared or approved by the U.S. Food and Drug Administration (FDA) or is covered by an Emergency Use Authorization (EUA) or Notification from the FDA to diagnose current infection with the SARS-CoV-2 virus; and

(ii) Administered in accordance with the FDA clearance or approval or the FDA EUA as applicable.

*Disinfect/disinfection* means using an EPA-registered disinfectant on EPA's "List N" (incorporated by reference, § 1910.509), in accordance with manufacturers' instructions to kill germs on surfaces.

DRAFT

*Face covering* means a product worn on the face specifically covering at least the wearer's nose and mouth with the primary purpose of providing source control by reducing the number of expelled droplets and aerosols from the wearer's nose and mouth into the air, and to provide a degree of particulate filtration to reduce the amount of inhaled particulate matter. This definition includes face coverings that otherwise meet the definition of face covering but are constructed of clear plastic (or include clear plastic windows), such as those utilized by persons communicating with those who are deaf or hard-of-hearing or when seeing a person's mouth is otherwise important.

*Facemask* means a surgical, medical procedure, dental, or isolation mask that is FDA-cleared or authorized by an FDA EUA. Facemasks may also be referred to as "medical procedure masks." Facemasks are intended for a medical purpose, such as prevention of infectious disease transmission (including uses related to COVID-19). In this manner, they function as source control. Surgical masks, a type of medical procedure mask, function as a barrier to protect the wearer from hazards such as splashes or large droplets of blood or bodily fluids.

*Face shield* means a device, typically made of clear plastic, that:

(i) is certified to ANSI/ISEA Z87.1" (incorporated by reference as specified in § 1910.509); or

(ii) covers the wearer's eyes, nose, and mouth to protect from splashes, sprays, and spatter of body fluids, wraps around the sides of the wearer's face (i.e., temple-to-temple), and extends below the wearer's chin.

*High-touch surfaces and equipment* means any surface or piece of equipment that is repeatedly touched by more than one person (e.g., doorknobs, light switches, countertops,

DRAFT

handles, desks, tables, phones, keyboards, tools, toilets, faucets, sinks, credit card terminals, touch-screen enabled devices).

*Physical location* means a site (including outdoor and indoor areas, a structure, or a group of structures) or an area within a site where work or any work-related activity (e.g., taking breaks, going to the restroom, eating, entering, or exiting work) occurs. A physical location includes the entirety of any space associated with the site (e.g., workstations, hallways, stairwells, breakrooms, bathrooms, elevators) and any other space that an employee might occupy in arriving, working, or leaving.

*Respirator* means a type of personal protective equipment that is certified by the National Institute for Occupational Safety and Health (NIOSH) under 42 CFR part 84 or is authorized under an Emergency Use Authorization (EUA) by the FDA. Respirators protect against airborne hazards by removing specific air contaminants from the ambient (surrounding) air or by supplying breathable air from a safe source. Common types of respirators include filtering facepiece respirators, elastomeric respirators, and powered air-purifying respirators (PAPRs). Face coverings, facemasks, and face shields are not respirators.

*Surgical mask* means a mask that covers the user's nose and mouth and provides a physical barrier to fluids and particulate materials. The mask meets certain fluid barrier protection standards and Class I or Class II flammability tests. Surgical masks are generally regulated by FDA as Class II devices under 21 CFR 878.4040 – Surgical apparel.

*Vaccine* means a biological product authorized or licensed by the FDA to prevent or provide protection against COVID-19, whether the substance is administered through a single shot or a series of shots.

DRAFT

*Workplace* means a physical location (e.g., fixed, mobile) where the employer's work or operations are performed.

(c) *COVID-19 plan*.

(1) The employer must develop and implement a COVID-19 plan for each workplace. If the employer has multiple facilities that are substantially similar, its COVID-19 plan may be developed by facility type rather than by individual workplace so long as all required site-specific information is included in the plan.

(2) If the employer has more than 10 employees, the COVID-19 plan must be written.

(3) The employer must designate one or more workplace COVID-19 safety coordinators to implement and monitor the COVID-19 plan developed under this section. The identity of the safety coordinator(s) must be documented in any written COVID-19 plan. The safety coordinator(s) must have the authority to ensure compliance with all aspects of the COVID-19 plan.

(4) The employer must conduct a workplace-specific hazard assessment to identify potential workplace hazards related to COVID-19.

(5) The employer must seek the input and involvement of non-managerial employees and their representatives, if any, in the hazard assessment and the development and implementation of the COVID-19 plan.

(6) The employer must monitor each workplace to ensure the ongoing effectiveness of the COVID-19 plan and update it as needed.

(7) The COVID-19 plan must address the hazards identified by the assessment required by paragraph (c)(4) of this section, and include policies and procedures to:

DRAFT

(i) Minimize the risk of transmission of COVID-19 for each employee, as required by paragraphs (d) through (k) of this section;

Note to paragraph (c)(7)(i): Although the employer's COVID-19 plan must account for the potential COVID-19 exposures to each employee, the plan can do so generally and need not address each employee individually.

(ii) Minimize the risk of transmission of COVID-19 to employees from visitors (e.g., customers and other non-employees) who enter the workplace. The COVID-19 plan must describe how employers will encourage or require visitors to use face coverings in the workplace. The COVID-19 plan must also address how employees should respond in the event that visitors do not follow the face covering policy and explain how the employer intends to minimize employee exposure to COVID-19 hazards from any visitor not wearing a face covering;

Note to paragraph (c)(7)(ii): The employer's visitor face covering policies and procedures may include exceptions to the face covering requirement for visitors while eating, drinking, or taking medication, for brief periods of time; while obtaining a service (for example, a medical or dental procedure) that requires removal of the face covering in order to perform the service; while playing certain musical instruments; while communicating, for brief periods of time, with a person who is hearing impaired when the ability to see the mouth is essential for communication; when necessary to temporarily remove the face covering to verify one's identity (e.g., during security screening); or for a child under the age of 2 years. When visitor face coverings are mandatory, exceptions must be provided for a narrow subset of persons with a disability who cannot wear a face covering or cannot safely wear a face covering because of the

DRAFT

disability, as defined in the Americans with Disabilities Act (42 USC 12101 et seq.). While most people with disabilities can safely wear a face covering, a small subset cannot wear a face covering because it could pose deadly risks. This includes people with severe disabilities who would not know to remove their face coverings if they are having difficulty breathing, are unable to independently remove their face coverings themselves, or cannot communicate promptly to someone else that their face coverings must be removed. The remaining portion of the subset who cannot wear a face covering may be exempted on a case-by-case basis.

(iii) Effectively communicate and coordinate with other employers;

(A) When employees of different employers share the same physical location, each employer must effectively communicate its COVID-19 plan to all other employers, coordinate to ensure that each of its employees is protected as required by this section, and adjust its COVID-19 plan to address any particular COVID-19 hazards presented by the other employees. This requirement does not apply to delivery people, messengers, and other employees who enter a workplace only briefly to drop off or pick up items.

(B) An employer with one or more employees working in a physical location controlled by another employer must notify the controlling employer when those employees are exposed to conditions at that location that do not meet the requirements of this section; and

(iv) Protect employees who in the course of their employment enter into private residences or other physical locations controlled by a person not covered by the OSH

DRAFT

Act (e.g., homeowners, sole proprietors). This must include procedures for employee withdrawal from that location if those protections are inadequate.

Note to paragraph (c): The employer may include other policies, procedures, or information necessary to comply with any applicable federal, state, or local public health laws, standards, and guidelines in their COVID-19 plan.

(d) *Physical distancing*.

(1) The employer must ensure that each employee is separated from all other people by at least 6 feet unless the employer can demonstrate that such physical distancing is not feasible for a specific activity. This provision does not apply to momentary exposure while people are in movement (e.g., passing in hallways or aisles).

(2) When the employer establishes it is not feasible for an employee to maintain a distance of at least 6 feet from all other people, the employer must ensure that the employee is as far apart from all other people as feasible.

Note to paragraph (d): Physical distancing can include methods such as: telework or other remote work arrangements; reducing the number of people, including visitors, in an area at one time; visual cues such as signs and floor markings to indicate where employees and others should be located or their direction and path of travel; staggered arrival, departure, work, and break times; and adjusted work processes or procedures, such as reducing production speed, to allow greater distance between employees.

(e) *Physical barriers*. At each fixed work location where each employee is not separated from all other people by at least 6 feet of distance, the employer must install cleanable solid barriers, except where the employer can demonstrate it is not feasible. The barrier must be sized (e.g., height and width) and located to block face-to-face pathways between individuals based on

DRAFT

where each person would normally stand or sit. The barrier may have a pass-through space at the bottom for objects and merchandise.

(f) *Face coverings*.

(1) Employers must provide, and ensure that employees wear, face coverings that meet the definition in paragraph (b) of this section, are made of at least two layers of fabric that is either a tightly woven material or non-woven material, and have no visible holes or openings in the material.

(2) The employer must ensure a face covering is worn by each employee over the nose and mouth when indoors, when outdoors and less than 6 feet away from another person, and when riding in a vehicle with another person for work purposes. The employer must provide a sufficient number of face coverings to each employee to comply with this paragraph. When an employee provides a face covering that meets the criteria in paragraph (f)(1) of this section, the employer may allow the employee to use it and is not required to reimburse the employee for that face covering.

(i) Employers providing disposable face coverings must ensure that each employee changes them at least once per day and whenever they are soiled or damaged.

(ii) Employers providing reusable face coverings must provide clean face coverings at least daily and replace the face covering if it is soiled or damaged or more frequently if specified by the manufacturer.

Note to paragraph (f)(2)(ii): When employers provide reusable face coverings, they may permit employees to clean and maintain the reusable face coverings provided by the employer.

DRAFT

(3) The following are exceptions to the requirements for face coverings in paragraph (f)(2) of this section:

(i) When an employee is alone in a room.

(ii) While an employee is eating and drinking at the workplace, provided each employee is at least 6 feet away from any other person, or separated from other people by a physical barrier.

(iii) When employees are wearing respirators in accordance with § 1910.134 or paragraph (f)(5) of this section.

(iv) When it is important to see a person's mouth (e.g., communicating with a hearing-impaired person) and the conditions do not permit a face covering that is constructed of clear plastic (or includes a clear plastic window). In such situations, the employer must ensure that each employee wears an alternative to protect the employee, such as a face shield, if the conditions permit it.

(v) When employees cannot wear face coverings due to a medical necessity, medical condition, or disability as defined in the Americans with Disabilities Act (42 USC 12101 et seq.). The exception for people with disabilities applies to a narrow group of individuals with severe disabilities for whom wearing a face covering would pose deadly risks, including those who would not know to remove their face covering if they are having difficulty breathing, those who are unable to independently remove their face covering themselves, or those who cannot communicate promptly to someone else that their face covering must be removed. The remaining portion of the subset who cannot wear a face covering may be exempted on a case-by-case basis. In

DRAFT

all such situations, the employer must ensure that each employee wears a face shield for the protection of the employee, if their condition or disability permits it.

(vi) When the employer can demonstrate that the use of a face covering presents a hazard to an employee of serious injury or death (e.g., arc flash, heat stress, interfering with the safe operation of equipment). In such situations, the employer must ensure that each employee wears an alternative to protect the employee, such as a face shield, if the conditions permit it. Any employee not wearing a face covering must remain at least 6 feet away from all other people unless the employer can demonstrate it is not feasible. The employee must resume wearing a face covering when not engaged in the activity where the face covering presents a hazard.

(vii) When the employer can demonstrate that the use of a face covering prevents an employee from performing an essential part of their job (e.g., actors while performing, politicians while delivering speeches, performers while playing certain musical instruments). Any employee not wearing a face covering must remain at least 6 feet away from all other people unless the employer can demonstrate it is not feasible. The employee must resume wearing a face covering when not engaged in the activity where the face covering prevents the employee from performing an essential part of their job.

(4) Where a face shield is required to comply with this paragraph or is otherwise required by the employer, the employer must ensure that face shields are cleaned at least daily and are not damaged. When an employee provides a face shield that meets the definition in paragraph (b), the employer may allow the employee to use it and is not required to reimburse the employee for that face shield.

DRAFT

(5) The employer may provide a respirator to the employee or permit the employee to wear their own respirator instead of a face covering as required by paragraphs (f)(1) and (f)(2) of this section. In such circumstances, the employer must comply with § 1910.504.

(6) The employer must not prevent any employee from voluntarily wearing their own face covering, facemask, and/or face shield in situations when they are not required unless the employer can demonstrate that doing so would create a hazard of serious injury or death, such as interfering with the safe operation of equipment. This provision is not intended to prevent the employer from prohibiting certain face coverings, facemasks, or face shields with symbols, messages, or colors to maintain workplace dress code standards.

(g) *Cleaning and disinfection*.

(1) The employer must clean high-touch surfaces and equipment at least once a day, following manufacturers' instructions for application of cleaners.

(2) When an employer is aware that a person who is COVID-19 positive has been in the workplace within the last 24 hours, the employer must clean and disinfect, in accordance with CDC's "Cleaning and Disinfecting Guidance" (incorporated by reference, § 1910.509), any areas, materials, and equipment under the employer's control that have likely been contaminated by the person who is COVID-19 positive (e.g., rooms they occupied, items they touched).

(3) The employer must provide readily accessible hand washing facilities. Where the employer establishes that readily accessible hand washing facilities cannot be provided, the employer must provide alcohol-based hand rub that is at least 60% ethanol or 70% isopropanol.

DRAFT

(h) *Ventilation*. Employers who own or control buildings or structures with an existing heating, ventilation, and air conditioning (HVAC) system(s) must ensure that:

(1) The HVAC system(s) is used in accordance with the HVAC manufacturer's instructions and the design specifications of the HVAC system(s);

(2) The amount of outside air supplied to the HVAC system(s) is maximized to the extent appropriate and compatible with the HVAC system's capabilities;

(3) All air filters are rated Minimum Efficiency Reporting Value (MERV) 13 or higher, if compatible with the HVAC system(s). If MERV-13 or higher filters are not compatible with the HVAC system(s), employers must use filters with the highest compatible filtering efficiency for the HVAC system(s);

(4) All air filters are maintained and replaced as necessary to ensure the proper function and performance of the HVAC system(s); and

(5) All intake ports that provide outside air to the HVAC system(s) are cleaned, maintained, and cleared of any debris that may affect the function and performance of the HVAC system(s).

Note 1 to paragraph (h): This paragraph does not require installation of new HVAC systems to replace or augment functioning systems.

Note 2 to paragraph (h): In addition to the requirements for existing HVAC systems, all employers should also consider other measures to improve ventilation in accordance with "CDC's Ventilation Guidance," (available at [www.cdc.gov/coronavirus/2019-ncov/community/ventilation.html]) (e.g., opening windows and doors). This could include maximizing ventilation in buildings without HVAC systems or in vehicles.

(i) *Health screening and medical management*.

DRAFT

(1) Screening.

(i) The employer must screen each employee before each work day and each shift for COVID-19 symptoms. Screening may be conducted by asking employees to self-monitor before reporting to work or may be conducted in-person by the employer.

(ii) If a COVID-19 test is required by the employer for screening purposes, the employer must provide the test to each employee at no cost to the employee.

(2) Employee notification to employer of COVID-19 illness or symptoms. The employer must require each employee to promptly notify the employer when the employee:

(i) is COVID-19 positive (i.e., confirmed positive test for, or has been diagnosed by a licensed healthcare provider with, COVID-19); or

(ii) has been told by a licensed healthcare provider that they are suspected to have COVID-19; or

(iii) is experiencing recent loss of taste and/or smell with no other explanation; or

(iv) is experiencing both fever (≥100.4° F) and new unexplained cough associated with shortness of breath.

(3) Employer notification to employees of COVID-19 exposure in the workplace.

(i) When the employer is notified that a person at its workplace(s) (including employees, vendors, contractors, customers, visitors, or other non-employees) is COVID-19 positive, the employer must, within 24 hours:

(A) Notify each employee who has been in close contact with that person. The notification must state the fact that the employee was in close contact with someone with COVID-19 along with the date(s) that contact occurred.

DRAFT

(B) Notify all other employees who worked in a well-defined portion of a facility (e.g., a particular floor) in which that person was present during the potential transmission period. The potential transmission period runs from 2 days before the person felt sick (or, for asymptomatic people, 2 days prior to test specimen collection) until the time the person is isolated. The notification must specify the date(s) the person with COVID-19 was in the workplace during the potential transmission period.

(C) Notify other employers whose employees have been in close contact with that person, or worked in a well-defined portion of a facility (e.g., a particular floor) in which that person was present, during the potential transmission period. The potential transmission period runs from 2 days before the person felt sick (or, for asymptomatic people, 2 days prior to test specimen collection) until the time the person is isolated. The notification must specify the date(s) the person with COVID-19 was in the workplace during the potential transmission period and the location(s) where the person with COVID-19 was in the workplace.

(ii) The notifications required by paragraph (i)(3)(i) of this section must not include any employee's name, contact information (e.g., phone number, email address), or occupation.

(4) Medical removal from the workplace.

(i) If the employer knows an employee meets the criteria listed in paragraph (i)(2)(i) of this section, then the employer must immediately remove that employee and keep the employee removed until the employee meets the return to work criteria in paragraph (i)(6) of this section.

DRAFT

(ii) If the employer knows an employee meets any of the criteria listed in paragraph (i)(2)(ii) – (i)(2)(iv) of this section, then the employer must immediately remove that employee and either:

(A) Keep the employee removed until they meet the return to work criteria in paragraph (i)(6) of this section; or

(B) Keep the employee removed and provide a COVID-19 test at no cost to the employee.

(*1*) If the test results are negative, the employee may return to work immediately.

(*2*) If the test results are positive, the employer must comply with paragraph (i)(4)(i) of this section.

(*3*) If the employee refuses to take the test, the employer must continue to keep the employee removed from the workplace consistent with paragraph (i)(4)(ii)(A) of this section, but the employer is not obligated to provide medical removal protection benefits in accordance with paragraph (i)(5)(iii) of this section. Absent undue hardship, employers must make reasonable accommodations or modifications for employees who cannot take the test for religious or disability related medical reasons.

Note to paragraph (i)(4)(ii): This partial symptom list in paragraph (i)(2)(iii) and (i)(2)(iv) of this section informs the employer of the minimum requirements for compliance. The full list of COVID-19 symptoms provided by CDC includes additional symptoms not listed in paragraphs (i)(2)(iii) – (i)(2)(iv) of this section. Employers may choose to remove or test employees with additional symptoms from the CDC list, or refer the employees to a healthcare provider.

DRAFT

(iii) (A) If the employer is required to notify an employee of close contact in the workplace to a person who is COVID-19 positive in accordance with paragraph (i)(3)(i)(A) of this section, then the employer must immediately remove that employee and either:

(*1*) Keep the employee removed for 14 days; or

(*2*) Keep the employee removed and provide a COVID-19 test at least five days after the exposure at no cost to the employee.

(*i*) If the test results are negative, the employee may return to work after seven days following exposure.

(*ii*) If the test results are positive, the employer must comply with paragraph (i)(4)(i) of this section.

(*iii*) If the employee refuses to take the test, the employer must continue to keep the employee removed from the workplace consistent with paragraph (i)(4)(iii)(A)(*1*) of this section, but the employer is not obligated to provide medical removal protection benefits in accordance with paragraph (i)(5)(iii) of this section. Absent undue hardship, employers must make reasonable accommodations or modifications for employees who cannot take the test for religious or disability related medical reasons.

(B) Employers are not required to remove any employee who would otherwise be required to be removed under paragraph (i)(4)(iii)(A) of this section if the employee does not experience the symptoms in paragraph (i)(2)(iii) or (i)(2)(iv) of this section and has:

DRAFT

(*1*) been fully vaccinated against COVID-19 (i.e., more than 2 weeks following the final dose); or

(*2*) had COVID-19 and recovered within the past 3 months.

(iv) Any time an employee is required to be removed from the workplace for any reason under paragraph (i)(4) of this section, the employer may require the employee to work remotely or in isolation if suitable work is available.

(5) Medical removal protection benefits.

(i) Employers with 10 or fewer employees on the effective date of this section are not required to comply with paragraphs (i)(5)(iii) - (i)(5)(iv) of this section.

(ii) When an employer allows an employee to work remotely or in isolation in accordance with paragraph (i)(4)(iv) of this section, the employer must continue to pay the employee the same regular pay and benefits the employee would have received had the employee not been absent from work, until the employee meets the return to work criteria specified in paragraph (i)(4)(iii) or (i)(6) of this section.

(iii) When an employer removes an employee in accordance with paragraph (i)(4) of this section:

(A) the employer must continue to pay the employee the same regular pay and benefits the employee would have received had the employee not been absent from work, up to $1,400 per week, until the employee meets the return to work criteria specified in paragraph (i)(4)(iii) or (i)(6) of this section.

(B) For employers with fewer than 500 employees, the $1,400 per week cap is reduced to $200 per day ($1,000 per week in most cases) beginning in the third week of an employee's removal.

DRAFT

(iv) The employer's payment obligation under paragraph (i)(5)(iii) of this section is reduced by the amount of compensation the employee receives from any other source, such as a publicly or employer-funded compensation program (e.g., paid sick leave, administrative leave, weather and safety leave), for earnings lost during the period of removal or any additional source of income the employee receives that is made possible by virtue of the employee's removal.

(v) Whenever an employee returns to the workplace after a COVID-19-related workplace removal, that employee must not suffer any adverse action as a result of that removal from the workplace and must maintain all employee rights and benefits, including the employee's right to their former job status, as if the employee had not been removed.

(6) Return to work. The employer must make decisions regarding an employee's return to work after a COVID-19-related workplace removal in accordance with guidance from a licensed healthcare provider or CDC's "Isolation Guidance" (incorporated by reference, § 1910.509); and CDC's "Isolation Discontinuation Non-Healthcare Guidance" (incorporated by reference, in § 1910.509).

Note to paragraph (i): OSHA recognizes that CDC's "COVID-19 Critical Infrastructure Sector Response Planning" (available at [https://www.cdc.gov/coronavirus/2019-ncov/community/critical-infrastructure-sectors.html]) allows asymptomatic exposed workers, who have not tested positive, as a last resort, to avoid quarantine, if the workers' quarantine may cause serious harm or danger to public health or safety and when additional precautions are implemented to protect the exposed workers and the community.

DRAFT

(j) *Vaccination*. When an employer makes a vaccine available to its employees, provided either at the workplace or off-site, the employer must do so at no cost to the employee (e.g., wages, vaccine administration costs, travel costs).

(k) *Training*.

(1) The employer must ensure that each employee receives training, in a language and at a literacy level the employee understands, and so that the employee comprehends at least the following:

(i) COVID-19, including how the disease is transmitted (including pre-symptomatic and asymptomatic transmission), the importance of hand washing and how to effectively wash hands, ways to reduce the risk of spreading COVID-19 through good respiratory etiquette, the signs and symptoms of the disease, risk factors for severe illness, and when to seek medical attention;

(ii) tasks and situations in the workplace that could result in COVID-19 infection;

(iii) workplace-specific policies and procedures to prevent the spread of COVID-19 that are applicable to the employee's duties (e.g., policies on physical distancing, physical barriers, and ventilation);

(iv) employer-specific policies and procedures for face coverings and face shields worn to comply with this section:

(A) when they are required;

(B) limitations on their protection against COVID-19;

(C) how to properly put them on, wear them, and take them off; and

(D) how to properly care for, store, clean, maintain, and dispose of them;

DRAFT

(v) any modifications to personal protective equipment (PPE) donning, doffing, cleaning, storage, maintenance, and disposal procedures needed to address COVID-19 when PPE is worn to address workplace hazards other than COVID-19;

(vi) employer-specific policies and procedures on the expectations for the use of face coverings by visitors (e.g., customers, other non-employees) who enter the workplace, how employees are to respond in the event that visitors do not follow the policies or procedures, and how the employer intends to minimize employee exposure to COVID-19 hazards from any person not wearing a face covering;

(vii) workplace-specific policies and procedures for cleaning and disinfection;

(viii) employer-specific policies and procedures on health screening and medical management;

(ix) available sick leave policies, any COVID-19-related benefits to which the employee may be entitled under applicable federal, state, or local laws, and other supportive policies and practices (e.g., telework, flexible hours);

(x) the identity of the safety coordinator(s) specified in the COVID-19 plan;

(xi) this section; and

(xii) how the employee can obtain copies of this section and any employer-specific policies and procedures developed under this section, including the employer's written COVID-19 plan, if required.

Note to paragraph (k)(1): Employers may rely on training completed prior to the effective date of this section to the extent that it meets the relevant training requirements under this paragraph.

(2) The employer must ensure that each employee receives additional training whenever:

DRAFT

(i) changes occur that affect the employee's risk of contracting COVID-19 at work (e.g., new job tasks);

(ii) policies or procedures are changed; or

(iii) there is an indication that the employee has not retained the necessary understanding or skill.

(l) *Anti-Retaliation*.

(1) The employer must inform each employee that:

(i) employees have a right to the protections required by this section; and

(ii) employers are prohibited from discharging or in any manner discriminating against any employee for exercising their right to the protections required by this section, or for engaging in actions that are required by this section.

(2) The employer must not discharge or in any manner discriminate against any employee for exercising their right to the protections required by this section, or for engaging in actions that are required by this section.

Note to paragraph (l): In addition, section 11(c) of the OSH Act also prohibits the employer from discriminating against an employee for exercising rights under, or as a result of actions that are required by, this section. That provision of the Act also protects the employee who files a safety and health complaint, or otherwise exercises any rights afforded by the OSH Act.

(m) *Requirements implemented at no cost to employees*. The implementation of all requirements of this section, with the exception of any employee self-monitoring conducted under paragraph (i)(1)(i) of this section, must be at no cost to employees.

(n) *Recordkeeping*.

DRAFT

(1) Small employer exclusion. Employers with 10 or fewer employees on the effective date of this section are not required to comply with paragraph (n)(2) or (n)(3) of this section.

(2) Required records. Employers with more than 10 employees on the effective date of this section must:

(i) retain all versions of the COVID-19 plan implemented to comply with this section while this section remains in effect.

(ii) establish and maintain a COVID-19 log to record each instance identified by the employer in which an employee is COVID-19 positive, regardless of whether the instance is connected to exposure to COVID-19 at work.

(A) The COVID-19 log must contain, for each instance, the employee's name, contact information, occupation, location where the employee worked, the date of the employee's last day at the workplace, the date of the positive test for, or diagnosis of, COVID-19, and the date the employee first had one or more COVID-19 symptoms, if any were experienced.

(B) The information in the COVID-19 log must be recorded within 24 hours of the employer learning that the employee is COVID-19 positive and must be maintained as though it is a confidential medical record and must not be disclosed except as required by this ETS or other federal law.

(C) The COVID-19 log must be maintained and preserved while this section remains in effect.

Note to paragraph (n)(2)(ii): The COVID-19 log is intended to assist employers with tracking and evaluating instances of employees who are COVID-19 positive without

DRAFT

regard to whether those employees were infected at work. The tracking will help evaluate potential workplace exposure to other employees.

(3) Availability of records. By the end of the next business day after a request, the employer must provide, for examination and copying:

(i) All versions of the written COVID-19 plan to all of the following: any employees, their personal representatives, and their authorized representatives.

(ii) The individual COVID-19 log entry for a particular employee to that employee and to anyone having written authorized consent of that employee.

(iii) A version of the COVID-19 log, excluding employee names, contact information, and occupations, to all of the following: any employees, their personal representatives, and their authorized representatives.

(iv) All records required to be maintained by this section to the Assistant Secretary.

Note to paragraph (n): Employers must continue to record all work-related confirmed cases of COVID-19 on their OSHA Forms 300, 300A, and 301, or the equivalent forms, if required to do so under 29 CFR part 1904.

(o) *Reporting COVID-19 fatalities and hospitalizations to OSHA.*

(1) The employer must report:

(i) Each work-related COVID-19 fatality to OSHA within 8 hours of the employer learning about the fatality.

(ii) Each work-related COVID-19 in-patient hospitalization to OSHA within 24 hours of the employer learning about the in-patient hospitalization.

DRAFT

(2) When reporting work-related COVID-19 fatalities and in-patient hospitalizations to OSHA, the employer must follow the requirements in 29 CFR 1904.39, except for 29 CFR 1904.39(a)(1) and (2) and (b)(6).

(p) *Dates*.

(1) Effective date. This section becomes effective on [INSERT DATE OF PUBLICATION IN THE FEDERAL REGISTER].

(2) Compliance dates.

(i) Employers must comply with all requirements of this section, except for the requirements in paragraph (e) and paragraph (h) of this section, by [INSERT DATE 14 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER].

(ii) Employers must comply with the requirements of this section in paragraph (e) and paragraph (h) of this section by [INSERT DATE 30 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER].

* * * * *

**§ 1910.502 Healthcare and Associated Industries.**

(a) *Scope and application*.

(1) This section applies to all settings where any employee:

(i) Provides healthcare services;

(ii) Performs healthcare support services;

(iii) Handles contaminated materials;

(iv) Handles human remains; or

(v) Conducts biomedical laboratory operations.

(2) This section does not apply to these tasks, which are covered by § 1910.501:

DRAFT

(i) the provision of first aid by an employee who is not a licensed healthcare provider;

(ii) the dispensing of prescriptions by pharmacists in retail settings; or

(iii) healthcare services or healthcare support services performed:

(A) outside of a setting where direct patient care occurs (e.g., telehealth, off-site medical billing); and

(B) do not involve the handling of contaminated materials.

(3) (i) Where a healthcare setting is embedded within a non-healthcare setting (e.g., nurse's office in a school, medical clinic in a manufacturing facility, walk-in clinic in a retail setting), this section applies only to the embedded setting and not to the remainder of the physical location, which is covered under § 1910.501.

(ii) Where emergency responders or other licensed health care providers (e.g., school nurse providing care to a student in a classroom) enter a non-healthcare setting to provide health care services, this section applies only to the provision of the healthcare services by that employee.

Note to paragraph (a): Nothing in this section is intended to limit state or local government mandates or guidance (e.g., executive order, health department order) that go beyond the requirements and are not inconsistent with this section.

(b) *Definitions*. The following definitions apply to this section:

*Aerosol-generating procedure* means a medical procedure that generates aerosols that can be infectious and are of respirable size (i.e., <10 μm). For the purposes of this section, only the following medical procedures are considered aerosol-generating procedures: open suctioning of airways; sputum induction; cardiopulmonary resuscitation; endotracheal intubation and extubation; non-invasive ventilation (e.g., BiPAP, CPAP); bronchoscopy; manual ventilation;

DRAFT

medical/surgical/postmortem procedures using oscillating bone saws; and dental procedures involving: ultrasonic scalers; high-speed dental handpieces; air/water syringes; air polishing; and air abrasion.

*Airborne infection isolation room (AIIR)* means a dedicated negative pressure patient-care room, with special air handling capability, which is used to isolate persons with a suspected or confirmed airborne-transmissible infectious disease. AIIRs include both permanent rooms and temporary structures (e.g., a booth, tent or other enclosure designed to operate under negative pressure).

*Assistant Secretary* means the Assistant Secretary of Labor for Occupational Safety and Health, U.S. Department of Labor, or designee.

*Biomedical laboratory operations* means operations conducted within biomedical diagnostic, research, and production laboratory facilities (including animal research facilities) where COVID-19, contaminated materials, or animals exposed to COVID-19 are handled.

*Clean/cleaning* means the removal of dirt and impurities, including germs, from surfaces using soap and water or other cleaning agents. Cleaning alone does not kill germs.

*Close contact* means being within 6 feet of another person for a cumulative total of 15 minutes or more over a 24-hour period during that person's potential period of transmission. The potential transmission period runs from 2 days before the person felt sick (or, for asymptomatic people, 2 days prior to test specimen collection) until the time the person is isolated.

*Common areas* means indoor or outdoor locations under the control of the employer that more than one person may use or where people congregate (e.g., building lobbies, reception areas, waiting rooms, restrooms, break rooms, eating areas, smoking areas, locker rooms, bathing areas, transit lounges, conference rooms).

DRAFT

*Contaminated material* means an item, biological specimen, or a surface that is a source of COVID-19 and is in, or originates from, a setting where: healthcare services are provided; human remains are handled; or biomedical laboratory operations are conducted.

*COVID-19 (Coronavirus Disease 2019)* means the respiratory disease caused by SARS-CoV-2 (severe acute respiratory syndrome coronavirus 2). For clarity and ease of reference, this section refers to "COVID-19" when describing exposures or potential exposures to SARS-CoV-2.

*COVID-19 positive* and *confirmed COVID-19* refer to a person who has a confirmed positive test for, or who has been diagnosed by a licensed healthcare provider with, COVID-19.

*COVID-19 symptoms* mean the following: fever or chills; cough; shortness of breath or difficulty breathing; fatigue; muscle or body aches; headache; new loss of taste or smell; sore throat; congestion or runny nose; nausea or vomiting; diarrhea.

*COVID-19 test* means a test for SARS-CoV-2 that is:

(i) Cleared or approved by the U.S. Food and Drug Administration (FDA) or is covered by an Emergency Use Authorization (EUA) or Notification from the FDA to diagnose current infection with the SARS-CoV-2 virus; and

(ii) Administered in accordance with the FDA clearance or approval or the FDA EUA as applicable.

*Direct patient care* means hands on, face-to-face contact with patients for the purpose of diagnosis, treatment, and monitoring.

*Disinfect/disinfection* means using an EPA-registered, hospital-grade disinfectant on EPA's "List N" (incorporated by reference, § 1910.509), in accordance with manufacturers' instructions to kill germs on surfaces.

DRAFT

*Elastomeric respirator* means a tight-fitting respirator with a facepiece that is made of synthetic or rubber material that permits it to be disinfected, cleaned, and reused according to manufacturer's instructions. It is equipped with a replaceable cartridge(s), canister(s), or filter(s).

*Face covering* means a product worn on the face specifically covering at least the wearer's nose and mouth with the primary purpose of providing source control by reducing the number of expelled droplets and aerosols from the wearer's nose and mouth into the air, and to provide a degree of particulate filtration to reduce the amount of inhaled particulate matter. This definition includes face coverings that otherwise meet the definition of face covering but are constructed of clear plastic (or include clear plastic windows), such as those utilized by persons communicating with those who are deaf or hard-of-hearing or when seeing a person's mouth is otherwise important.

*Facemask* means a surgical, medical procedure, dental, or isolation mask that is FDA-cleared or authorized by an FDA EUA. Facemasks may also be referred to as "medical procedure masks." Facemasks are intended for a medical purpose, such as prevention of infectious disease transmission (including uses related to COVID-19). In this manner, they function as source control. Surgical masks, a type of medical procedure mask, function as a barrier to protect the wearer from hazards such as splashes or large droplets of blood or bodily fluids.

*Face shield* means a device, typically made of clear plastic, that:

(i) is certified to ANSI/ISEA Z87.1 (incorporated by reference, § 1910.509); or

(ii) covers the wearer's eyes, nose, and mouth to protect from splashes, sprays, and spatter of body fluids, wraps around the sides of the wearer's face (i.e., temple-to-temple), and extends below the wearer's chin.

DRAFT

*Filtering facepiece respirator* means a negative pressure particulate respirator with a non-replaceable filter as an integral part of the facepiece or with the entire facepiece composed of the non-replaceable filtering medium.

*Handles / handling of contaminated materials* means activities including the intake, collection, processing, containerization, storage, transport, shipping, disposal, or decontamination of contaminated materials. Settings where contaminated materials are handled include: settings where healthcare services are provided; healthcare laundry facilities; medical waste handling facilities; medical equipment reprocessing facilities; mortuaries; and biomedical laboratories.

*Handles / handling of human remains* means activities including the intake, collection, processing, storage, transport, shipping, cremation, or burial of human remains. Settings where human remains are handled include: settings where healthcare services are provided, medical examiners' offices, morgues, mortuaries, and some biomedical laboratories (e.g., forensic laboratories) and teaching facilities.

*Healthcare services* mean services that are provided to individuals by professional healthcare practitioners (e.g., doctors, nurses, emergency medical personnel, oral health professionals) for the purpose of promoting, maintaining, monitoring, or restoring health. Healthcare services are delivered through various means including: hospitalization, long-term care, ambulatory care (e.g., treatment in physicians' offices, dentists' offices, medical clinics), home health and hospice care, emergency medical response, and patient transport.

*Healthcare support services* mean services that facilitate the provision of healthcare services. Healthcare support services include patient intake/admission, patient food services,

DRAFT

equipment and facility maintenance, housekeeping services, healthcare laundry services, medical waste handling services, and medical equipment cleaning/reprocessing services.

*High-touch surfaces and equipment* means any surface or piece of equipment that is repeatedly touched by more than one person (e.g., doorknobs, light switches, countertops, handles, desks, tables, phones, keyboards, tools, toilets, faucets, sinks, credit card terminals, touch-screen enabled devices).

*Physical location* means a site (including outdoor and indoor areas, a structure, or a group of structures) or an area within a site where work or any work-related activity (e.g., taking breaks, going to the restroom, eating, entering, or exiting work) occurs. A physical location includes the entirety of any space associated with the site (e.g., workstations, hallways, stairwells, breakrooms, bathrooms, elevators) and any other space that an employee might occupy in arriving, working, or leaving.

*Powered air-purifying respirator (PAPR)* means an air-purifying respirator that uses a blower to force the ambient air through air-purifying elements to the inlet covering.

*Respirator* means a type of personal protective equipment (PPE) that is certified by NIOSH under 42 CFR part 84 or is authorized under an Emergency Use Authorization (EUA) by the FDA. Respirators protect against airborne hazards by removing specific air contaminants from the ambient (surrounding) air or by supplying breathable air from a safe source. Common types of respirators include filtering facepiece respirators, elastomeric respirators, and PAPRs. Face coverings, facemasks, and face shields are not respirators.

*Surgical mask* means a mask that covers the user's nose and mouth and provides a physical barrier to fluids and particulate materials. The mask meets certain fluid barrier

DRAFT

protection standards and Class I or Class II flammability tests. Surgical masks are generally regulated by FDA as Class II devices under 21 CFR 878.4040 – Surgical apparel.

*Vaccine* means a biological product authorized or licensed by the FDA to prevent or provide protection against COVID-19, whether the substance is administered through a single shot or a series of shots.

*Workplace* means a physical location (e.g., fixed, mobile) where the employer's work or operations are performed.

(c) *COVID-19 plan*.

(1) The employer must develop and implement a COVID-19 plan for each workplace. If the employer has multiple facilities that are substantially similar, its COVID-19 plan may be developed by facility type rather than by individual workplace so long as all required site-specific information is included in the plan.

(2) If the employer has more than 10 employees, the COVID-19 plan must be written.

(3) The employer must designate one or more workplace COVID-19 safety coordinators to implement and monitor the COVID-19 plan developed under this section. The COVID-19 safety coordinator(s) must be knowledgeable in infection control principles and practices as they apply to the workplace and employee job operations. The identity of the safety coordinator(s) must be documented in any written COVID-19 plan. The safety coordinator(s) must have the authority to ensure compliance with all aspects of the COVID-19 plan.

(4) The employer must conduct a workplace-specific hazard assessment to identify potential workplace hazards related to COVID-19.

DRAFT

(5) The employer must seek the input and involvement of non-managerial employees and their representatives, if any, in the hazard assessment and the development and implementation of the COVID-19 plan.

(6) The employer must monitor each workplace to ensure the ongoing effectiveness of the COVID-19 plan and update it as needed.

(7) The COVID-19 plan must address the hazards identified by the assessment required by paragraph (c)(4) of this section, and include policies and procedures to:

(i) Minimize the risk of transmission of COVID-19 for each employee, as required by paragraphs (d) through (n) of this section;

Note to paragraph (c)(7)(i): Although the employer's COVID-19 plan must account for the potential COVID-19 exposures to each employee, the plan can do so generally and need not address each employee individually.

(ii) Minimize the risk of transmission of COVID-19 to employees from non-employees (e.g., clients, patients, residents, delivery people and other visitors, customers) who enter the workplace. The COVID-19 plan must describe how employers will encourage or require non-employees to use face coverings in the workplace. The COVID-19 plan must also address how employees should respond in the event that non-employees do not follow the face covering policy and explain how the employer intends to minimize employee exposure to COVID-19 hazards from any non-employee not wearing a face covering;

Note to paragraph (c)(7)(ii): The employer's non-employee face covering policies and procedures may include exceptions to the face covering requirement for non-employees while eating, drinking, or taking medication, for brief periods of time; while obtaining a

DRAFT

service (for example, a medical or dental procedure) that requires removal of the face covering in order to perform the service; while playing certain musical instruments; while communicating, for brief periods of time, with a person who is hearing impaired when the ability to see the mouth is essential for communication; when necessary to temporarily remove the face covering to verify one's identity (e.g., during security screening); or for a child under the age of 2 years. When visitor face coverings are mandatory, exceptions must be provided for a narrow subset of persons with a disability who cannot wear a face covering or cannot safely wear a face covering because of the disability, as defined in the Americans with Disabilities Act (42 USC 12101 et seq.). While most people with disabilities can safely wear a face covering, a small subset cannot wear a face covering because it could pose deadly risks. This includes people with severe disabilities who would not know to remove their face coverings if they are having difficulty breathing, are unable to independently remove their face coverings themselves, or cannot communicate promptly to someone else that their face coverings must be removed. The remaining portion of the subset who cannot wear a face covering may be exempted on a case-by-case basis.

(iii) Effectively communicate and coordinate with other employers;

(A) When employees of different employers share the same physical location, each employer must effectively communicate its COVID-19 plan to all other employers, coordinate to ensure that each of its employees is protected as required by this section, and adjust its COVID-19 plan to address any particular COVID-19 hazards presented by the other employees. This requirement does not apply to

DRAFT

delivery people, messengers, and other employees who enter a workplace only briefly to drop off or pick up items.

(B) An employer with one or more employees working in a physical location controlled by another employer must notify the controlling employer when those employees are exposed to conditions at that location that do not meet the requirements of this section; and

(iv) Protect employees who in the course of their employment enter into private residences or other physical locations controlled by a person not covered by the OSH Act (e.g., homeowners, sole proprietors). This must include procedures for employee withdrawal from that location if those protections are inadequate.

Note to paragraph (c): The employer may include other policies, procedures, or information necessary to comply with any applicable federal, state, or local public health laws, standards, and guidelines in their COVID-19 plan.

(d) *Patient screening and management*. In settings where direct patient care is provided, the employer must:

(1) Limit and monitor points of entry to the setting. This provision does not apply where emergency responders or other licensed healthcare providers (e.g., school nurse providing care to a student in a classroom) enter a non-healthcare setting to provide healthcare services.

(2) Screen and triage all clients, patients, residents, delivery people and other visitors, and other non-employees entering the setting for symptoms of COVID-19.

DRAFT

(3) Implement other applicable patient management strategies in accordance with CDC's "COVID-19 Infection Prevention and Control Recommendations" (incorporated by reference, § 1910.509).

Note to paragraph (d): The employer is encouraged to use telehealth services where available and appropriate in order to limit the number of people entering the facility.

(e) *Standard and Transmission-Based Precautions/Good Biosafety Practices*.

(1) In settings where healthcare services, healthcare support services, or mortuary services are provided, the employer must develop and implement policies and procedures to adhere to Standard and Transmission-Based Precautions in accordance with CDC's "Guidelines for Isolation Precautions" (incorporated by reference, § 1910.509).

(2) In settings where biomedical laboratory operations are conducted, the employer must develop and implement policies and procedures to adhere to recognized good biosafety practices.

(f) *Personal protective equipment (PPE)*.

(1) Facemasks.

(i) Employers must provide, and ensure that employees wear, facemasks that meet the definition in paragraph (b) of this section; and

(ii) The employer must ensure a facemask is worn by each employee over the nose and mouth when indoors, when outdoors and less than 6 feet away from another person, and when riding in a vehicle with other people for work purposes. The employer must provide a sufficient number of facemasks to each employee to comply with this paragraph and must ensure that each employee changes them at least once per day,

DRAFT

whenever they are soiled or damaged, and more frequently as necessary (e.g., patient care reasons).

(iii) The following are exceptions to the requirements for facemasks in paragraph (f)(1)(ii) of this section:

(A) When an employee is alone in a room.

(B) While an employee is eating and drinking at the workplace, provided each employee is at least 6 feet away from any other person, or separated from other people by a physical barrier.

(C) When employees are wearing respiratory protection in accordance with § 1910.134 or paragraph (f) of this section.

(D) When it is important to see a person's mouth (e.g., communicating with a hearing-impaired person) and the conditions do not permit a facemask that is constructed of clear plastic (or includes a clear plastic window). In such situations, the employer must ensure that each employee wears an alternative to protect the employee, such as a face shield, if the conditions permit it.

(E) When employees cannot wear facemasks due to a medical necessity, medical condition, or disability as defined in the Americans with Disabilities Act (42 USC 12101 et seq.). The exception for people with disabilities applies to a narrow group of individuals with severe disabilities for whom wearing a facemask would pose deadly risks, including those who would not know to remove their facemask if they are having difficulty breathing, those who are unable to independently remove their facemask themselves, or those who cannot communicate promptly to someone else that their facemask must be removed. The remaining portion of the

DRAFT

subset who cannot wear a facemask may be exempted on a case-by-case basis. In all such situations, the employer must ensure that each employee wears a face shield for the protection of the employee, if their condition or disability permits it.

(F) When the employer can demonstrate that the use of a facemask presents a hazard to an employee of serious injury or death (e.g., arc flash, heat stress, interfering with the safe operation of equipment). In such situations, the employer must ensure that each employee wears an alternative to protect the employee, such as a face shield, if the conditions permit it. Any employee not wearing a facemask must remain at least 6 feet away from all other people unless the employer can demonstrate it is not feasible. The employee must resume wearing a facemask when not engaged in the activity where the facemask presents a hazard.

Note to paragraph (f)(1)(iii)(F): With respect to paragraphs (f)(1)(iii)(D) through (F) of this section, the employer may determine that the use of face shields, without facemasks, in certain settings is not appropriate due to other infection control concerns.

(iv) Where a face shield is required to comply with this paragraph or is otherwise required by the employer, the employer must ensure that face shields are cleaned at least daily and are not damaged. When an employee provides a face shield that meets the definition in paragraph (b) of this section, the employer may allow the employee to use it and is not required to reimburse the employee for that face shield.

(2) Respirators and other PPE for exposure to people with suspected or confirmed COVID-19. When employees have exposure to a person with suspected or confirmed COVID-19, the employer must provide:

DRAFT

(i) a respirator to each employee and ensure that it is provided and used in accordance with § 1910.134 and

(ii) gloves, an isolation gown or protective clothing, and eye protection to each employee and ensure that the PPE is used in accordance with subpart I of this part.

Note to paragraph (f)(2): When there is a limited supply of filtering facepiece respirators, employers may follow the CDC's "Strategies for Optimizing the Supply of N95 Respirators" (available at: [https://www.cdc.gov/coronavirus/2019-ncov/hcp/respirators-strategy/index.html]). Where possible, employers are encouraged to select elastomeric respirators or PAPRs instead of filtering facepiece respirators to prevent shortages and supply chain disruption.

(3) Respirators and other PPE during aerosol-generating procedures.

(i) For aerosol-generating procedures performed on a person with suspected or confirmed COVID-19, the employer must provide:

(A) a respirator to each employee and ensure that it is provided and used in accordance with § 1910.134; and

(B) gloves, an isolation gown or protective clothing, and eye protection to each employee and ensure that the PPE is used in accordance with subpart I of this part.

Note 1 to paragraph (f)(3)(i): For aerosol-generating procedures on a person suspected or confirmed with COVID-19, employers are encouraged to select elastomeric respirators or PAPRs instead of filtering facepiece respirators.

DRAFT

Note 2 to paragraph (f)(3)(i): Additional requirements specific to aerosol-generating procedures on people with suspected or confirmed COVID-19 are contained in paragraph (g) of this section.

(ii) For aerosol-generating procedures performed on a person who is not suspected or confirmed to have COVID-19, the employer must provide:

(A) a respirator to each employee and ensure that it is provided and used in accordance with § 1910.504; and

(B) gloves, an isolation gown or protective clothing, and eye protection to each employee and ensure that the PPE is used in accordance with subpart I of this part.

(4) Use of respirators when not required.

(i) The employer may provide a respirator to the employee instead of a facemask as required by paragraph (f)(1) of this section. In such circumstances, the employer must comply with § 1910.504.

(ii) Where the employer provides the employee with a facemask as required by paragraph (f)(1) of this section, the employer must permit the employee to wear their own respirator instead of a facemask. In such circumstances, the employer must also comply with § 1910.504.

(5) Respirators and other PPE based on Standard and Transmission-Based Precautions or good biosafety practices. The employer must provide protective clothing and equipment (e.g., respirators, gloves, gowns, goggles, face shields) to each employee in accordance with Standard and Transmission-Based Precautions in healthcare settings in accordance with CDC's "Guidelines for Isolation Precautions" (incorporated by reference, §

DRAFT

1910.509), or recognized good biosafety practices in laboratories, and ensure that the protective clothing and equipment is used in accordance with subpart I of this part.

(g) *Aerosol-generating procedures on a person with suspected or confirmed COVID-19*. When an aerosol-generating procedure is performed on a person with suspected or confirmed COVID-19:

(1) The employer must limit the number of employees present during the procedure to only those essential for patient care and procedure support.

(2) The employer must ensure that the procedure is performed in an existing AIIR, if available.

(3) After the procedure is completed, the employer must clean and disinfect the surfaces and equipment in the room or area where the procedure was performed.

Note to paragraph (g): Respirators and other PPE requirements during aerosol-generating procedures are contained in paragraph (f)(3) of this section.

(h) *Physical distancing*.

(1) The employer must ensure that each employee is separated from all other people by at least 6 feet unless the employer can demonstrate that such physical distancing is not feasible for a specific activity (e.g., hands-on medical care). This provision does not apply to momentary exposure while people are in movement (e.g., passing in hallways or aisles).

(2) When the employer establishes it is not feasible for an employee to maintain a distance of at least 6 feet from all other people, the employer must ensure that the employee is as far apart from all other people as feasible.

DRAFT

Note to paragraph (h): Physical distancing can include methods such as: telehealth; telework or other remote work arrangements; reducing the number of people, including non-employees, in an area at one time; visual cues such as signs and floor markings to indicate where employees and others should be located or their direction and path of travel; staggered arrival, departure, work, and break times; and adjusted work processes or procedures, such as reducing production speed, to allow greater distance between employees.

(i) *Physical barriers*. At each fixed work location outside of direct patient care areas (e.g., entryway/lobby, check-in desks, triage, pharmacy windows, bill payment) where each employee is not separated from all other people by at least 6 feet of distance, the employer must install cleanable solid barriers, except where the employer can demonstrate it is not feasible. The barrier must be sized (e.g., height and width) and located to block face-to-face pathways between individuals based on where each person would normally stand or sit. The barrier may have a pass-through space at the bottom for objects and merchandise.

Note to paragraph (i): Physical barriers are not required in direct patient care areas or resident rooms.

(j) *Cleaning and disinfection*.

(1) In patient care areas, resident rooms, and for medical devices and equipment, the employer must follow standard practices for cleaning and disinfection of surfaces and equipment in accordance with CDC's "COVID-19 Infection Prevention and Control Recommendations" (incorporated by reference, § 1910.509) and CDC's "Guidelines for Environmental Infection Control," pp. 86–103, 147-149 (both incorporated by reference, § 1910.509).

(2) In all other areas, the employer must:

DRAFT

(i) clean high-touch surfaces and equipment at least once a day, following manufacturers' instructions for application of cleaners; and

(ii) When employer is aware that a person who is COVID-19 positive has been in the workplace within the last 24 hours, clean and disinfect, in accordance with CDC's "Cleaning and Disinfecting Guidance" (incorporated by reference, § 1910.509), any areas, materials, and equipment under the employer's control that have likely been contaminated by the person who is COVID-19 positive (e.g., rooms they occupied, items they touched).

(3) The employer must provide readily accessible hand washing facilities. Where the employer establishes that readily accessible hand washing facilities cannot be provided, the employer must provide alcohol-based hand rub that is at least 60% ethanol or 70% isopropanol.

(k) *Ventilation*.

(1) Employers who own or control buildings or structures with an existing heating, ventilation, and air conditioning (HVAC) system(s) must ensure that:

(i) The HVAC system(s) is used in accordance with the HVAC manufacturer's instructions and the design specifications of the HVAC system(s);

(ii) The amount of outside air circulated through its HVAC system(s) and the number of air changes per hour are maximized to the extent appropriate;

(iii) All air filters are rated Minimum Efficiency Reporting Value (MERV) 13 or higher, if compatible with the HVAC system(s). If MERV-13 or higher filters are not compatible with the HVAC system(s), employers must use filters with the highest compatible filtering efficiency for the HVAC system(s);

DRAFT

(iv) All air filters are maintained and replaced as necessary to ensure the proper function and performance of the HVAC system(s); and

(v) All intake ports that provide outside air to the HVAC system(s) are cleaned, maintained, and cleared of any debris that may affect the function and performance of the HVAC system(s).

(2) Where the employer has an existing AIIR, the employer must maintain and operate it in accordance with its design and construction criteria.

Note 1 to paragraph (k): This section does not require installation of new HVAC systems or AIIRs to replace or augment functioning systems.

Note 2 to paragraph (k): In addition to the requirements for existing HVAC systems and AIIRs, all employers should also consider other measures to improve ventilation in accordance with "CDC's Ventilation Guidance," (available at [www.cdc.gov/coronavirus/2019-ncov/community/ventilation.html]) (e.g., opening windows and doors). This could include maximizing ventilation in buildings without HVAC systems or in vehicles.

(l) *Health screening and medical management*.

(1) Screening.

(i) The employer must screen each employee before each work day and each shift for COVID-19 symptoms. Screening may be conducted by asking employees to self-monitor before reporting to work or may be conducted in-person by the employer.

(ii) If a COVID-19 test is required by the employer for screening purposes, the employer must provide the test to each employee at no cost to the employee.

(2) Employee notification to employer of COVID-19 illness or symptoms. The employer must require each employee to promptly notify the employer when the employee:

DRAFT

(i) is COVID-19 positive (i.e., confirmed positive test for, or has been diagnosed by a licensed healthcare provider with, COVID-19); or

(ii) has been told by a licensed healthcare provider that they are suspected to have COVID-19; or

(iii) is experiencing recent loss of taste and/or smell with no other explanation; or

(iv) is experiencing both fever (≥100.4° F) and new unexplained cough associated with shortness of breath.

(3) Employer notification to employees of COVID-19 exposure in the workplace.

(i) Except as provided for in paragraph (l)(3)(iii) of this section, when the employer is notified that a person at its workplace(s) (including employees, clients, patients, residents, vendors, contractors, customers, delivery people and other visitors, or other non-employees) is COVID-19 positive, the employer must, within 24 hours:

(A) Notify each employee who was not wearing a respirator and any other required PPE and has been in close contact with that person. The notification must state the fact that the employee was in close contact with someone with COVID-19 along with the date(s) that contact occurred.

(B) Notify all other employees who were not wearing a respirator and any other required PPE and worked in a well-defined portion of a facility (e.g., a particular floor) in which that person was present during the potential transmission period. The potential transmission period runs from 2 days before the person felt sick (or, for asymptomatic people, 2 days prior to test specimen collection) until the time the person is isolated. The notification must specify the date(s) the person with COVID-19 was in the workplace during the potential transmission period.

DRAFT

(C) Notify other employers whose employees were not wearing respirators and any other required PPE and have been in close contact with that person, or worked in a well-defined portion of a facility (e.g., a particular floor) in which that person was present, during the potential transmission period. The potential transmission period runs from 2 days before the person felt sick (or, for asymptomatic people, 2 days prior to test specimen collection) until the time the person is isolated. The notification must specify the date(s) the person with COVID-19 was in the workplace during the potential transmission period and the location(s) where the person with COVID-19 was in the workplace.

(ii) The notifications required by paragraph (l)(3)(i) of this section must not include any employee's name, contact information (e.g., phone number, email address), or occupation.

(iii) The notification provisions are not triggered by the presence of a patient with confirmed COVID-19 in a workplace where services are normally provided to suspected or confirmed COVID-19 patients (e.g., emergency rooms, urgent care facilities, COVID-19 testing sites, COVID-19 wards in hospitals).

(4) Medical removal from the workplace.

(i) If the employer knows an employee meets the criteria listed in paragraph (l)(2)(i) of this section, then the employer must immediately remove that employee and keep the employee removed until they meet the return to work criteria in paragraph (l)(6) of this section.

DRAFT

(ii) If the employer knows an employee meets the criteria listed in paragraph (l)(2)(ii) – (l)(2)(iv) of this section, then the employer must immediately remove that employee and either:

(A) Keep the employee removed until they meet the return to work criteria in paragraph (l)(6) of this section; or

(B) Keep the employee removed and provide a COVID-19 test at no cost to the employee.

(*1*) If the test results are negative, the employee may return to work immediately.

(*2*) If the test results are positive, the employer must comply with paragraph (l)(4)(i) of this section.

(*3*) If the employee refuses to take the test, the employer must continue to keep the employee removed from the workplace consistent with paragraph (l)(4)(ii)(A) of this section, but the employer is not obligated to provide medical removal protection benefits in accordance with paragraph (l)(5)(iii) of this section. Absent undue hardship, employers must make reasonable accommodations or modifications for employees who cannot take the test for religious or disability related medical reasons.

Note to paragraph (l)(4)(ii): This partial symptom list in paragraph (l)(2)(iii) and (l)(2)(iv) of this section informs the employer of the minimum requirements for compliance. The full list of COVID-19 symptoms provided by CDC includes additional symptoms not listed in paragraphs (l)(2)(iii) – (l)(2)(iv) of this section. Employers may choose to remove or test employees with additional symptoms from the CDC list, or refer the employees to a healthcare provider.

DRAFT

(iii) (A) If the employer is required to notify the employee of close contact in the workplace to a person who is COVID-19 positive in accordance with paragraph (l)(3)(i)(A) of this section, then the employer must immediately remove that employee and either:

(*1*) Keep the employee removed for 14 days; or

(*2*) Keep the employee removed and provide a COVID-19 test at least five days after the exposure at no cost to the employee.

(*i*) If the test results are negative, the employee may return to work after seven days following exposure.

(*ii*) If the test results are positive, the employer must comply with paragraph (l)(4)(i) of this section.

(*iii*) If the employee refuses to take the test, the employer must continue to keep the employee removed from the workplace consistent with paragraph (l)(4)(iii)(A)(*1*) of this section, but the employer is not obligated to provide medical removal protection benefits in accordance with paragraph (l)(5)(iii) of this section. Absent undue hardship, employers must make reasonable accommodations or modifications for employees who cannot take the test for religious or disability related medical reasons.

(B) Employers are not required to remove any employee who would otherwise be required to be removed under paragraph (i)(4)(iii)(A) of this section if the employee does not experience the symptoms in paragraph (l)(2)(iii) or (l)(2)(iv) of this section and has:

DRAFT

(*1*) been fully vaccinated against COVID-19 (i.e., more than 2 weeks following the final dose); or

(*2*) had COVID-19 and recovered within the past 3 months.

(iv) Any time an employee is required to be removed from the workplace for any reason under paragraph (l)(4) of this section, the employer may require the employee to work remotely or in isolation if suitable work is available.

(5) Medical removal protection benefits.

(i) Employers with 10 or fewer employees on the effective date of this section are not required to comply with paragraphs (l)(5)(iii) - (l)(5)(iv) of this section.

(ii) When an employer allows an employee to work remotely or in isolation in accordance with paragraph (l)(4)(iv) of this section, the employer must continue to pay the employee the same regular pay and benefits the employee would have received had the employee not been absent from work, until the employee meets the return to work criteria specified in paragraph (l)(4)(iii) or (l)(6) of this section.

(iii) When an employer removes an employee in accordance with paragraph (l)(4) of this section:

(A) the employer must continue to pay the employee the same regular pay and benefits the employee would have received had the employee not been absent from work, up to $1,400 per week, until the employee meets the return to work criteria specified in paragraph (l)(4)(iii) or (l)(6) of this section.

(B) For employers with fewer than 500 employees, the $1,400 per week cap is reduced to $200 per day ($1,000 per week in most cases) beginning in the third week of an employee's removal.

DRAFT

(iv) The employer's payment obligation under paragraph (l)(5)(iii) of this section is reduced to by the amount of compensation that the employee receives from any other source, such as a publicly or employer-funded compensation program (e.g., paid sick leave, administrative leave, weather and safety leave), for earnings lost during the period of removal or any additional source of income the employee receives that is made possible by virtue of the employee's removal.

(v) Whenever an employee returns to the workplace after a COVID-19-related workplace removal, that employee must not suffer any adverse action as a result of that removal from the workplace and must maintain all employee rights and benefits, including the employee's right to their former job status, as if the employee had not been removed.

(6) Return to work. The employer must make decisions regarding an employee's return to work after a COVID-19-related workplace removal in accordance with guidance from a licensed healthcare provider or CDC's "Isolation Guidance" (incorporated by reference, § 1910.509); and CDC's "Return to Work Healthcare Guidance" (incorporated by reference, § 1910.509).

Note to paragraph (l): OSHA recognizes that CDC's "Strategies to Mitigate Healthcare Personnel Staffing Shortages" (available at [www.cdc.gov/coronavirus/2019-ncov/hcp/mitigating-staff-shortages.html]) allows elimination of quarantine for certain healthcare workers, but only as a last resort**,** if the workers' absence would mean there are no longer enough staff to provide safe patient care, specific other amelioration strategies have already been tried, patients have been notified, and workers are utilizing additional PPE at all times.

DRAFT

(m) *Vaccination*. When an employer makes a vaccine available to its employees, provided either at the workplace or off-site, the employer must do so at no cost to the employee (e.g., wages, vaccine administration costs, travel costs).

(n) *Training*.

(1) The employer must ensure that each employee receives training, in a language and at a literacy level the employee understands, and so that the employee comprehends at least the following:

(i) COVID-19, including how the disease is transmitted (including pre-symptomatic and asymptomatic transmission), the importance of hand washing and how to effectively wash hands, ways to reduce the risk of spreading COVID-19 through good respiratory etiquette, the signs and symptoms of the disease, risk factors for severe illness, and when to seek medical attention;

(ii) employer-specific policies and procedures on patient screening and management;

(iii) tasks and situations in the workplace that could result in COVID-19 infection;

(iv) workplace-specific policies and procedures to prevent the spread of COVID-19 that are applicable to the employee's duties (e.g., policies on Standard and Transmission-Based Precautions and/or good biosafety practices, physical distancing, physical barriers, ventilation, aerosol-generating procedures);

(v) employer-specific multi-employer workplace agreements related to infection control policies and procedures, the use of common areas, and the use of shared equipment that affect employees at the workplace;

(vi) employer-specific policies and procedures for PPE worn to comply with this section, including:

DRAFT

(A) when PPE is required for protection against COVID-19;

(B) limitations of PPE for protection against COVID-19;

(C) how to properly put on, wear, and take off PPE;

(D) how to properly care for, store, clean, maintain, and dispose of PPE; and

(E) any modifications to donning, doffing, cleaning, storage, maintenance, and disposal procedures needed to address COVID-19 when PPE is worn to address workplace hazards other than COVID-19;

(vii) employer-specific policies and procedures on the expectations for the use of face coverings by non-employees (e.g., clients, patients, residents, delivery people and other visitors, or customers) who enter the workplace, how employees are to respond in the event that non-employees do not follow the policies or procedures, and how the employer intends to minimize employee exposure to COVID-19 hazards from any person not wearing a face covering;

(viii) workplace-specific policies and procedures for cleaning and disinfection;

(ix) employer-specific policies and procedures on health screening and medical management;

(x) available sick leave policies, any COVID-19-related benefits to which the employee may be entitled under applicable federal, state, or local laws, and other supportive policies and practices (e.g., telework, flexible hours);

(xi) the identity of the safety coordinator(s) specified in the COVID-19 plan,

(xii) this section; and

DRAFT

(xiii) how the employee can obtain copies of this section and any employer-specific policies and procedures developed under this section, including the employer's written COVID-19 plan, if required.

Note to paragraph (n)(1): Employers may rely on training completed prior to the effective date of this section to the extent that it meets the relevant training requirements under this paragraph.

(2) The employer must ensure that each employee receives additional training whenever:

(i) changes occur that affect the employee's risk of contracting COVID-19 at work (e.g., new job tasks);

(ii) policies or procedures are changed; or

(iii) there is an indication that the employee has not retained the necessary understanding or skill.

(3) The employer must ensure that the training is overseen or conducted by a person knowledgeable in the covered subject matter as it relates to the employee's job duties.

(4) The employer must ensure that the training provides an opportunity for interactive questions and answers with a person knowledgeable in the covered subject matter as it relates to the employee's job duties.

(o) *Anti-Retaliation*.

(1) The employer must inform each employee that:

(i) employees have a right to the protections required by this section; and

(ii) employers are prohibited from discharging or in any manner discriminating against any employee for exercising their right to the protections required by this section, or for engaging in actions that are required by this section.

DRAFT

(2) The employer must not discharge or in any manner discriminate against any employee for exercising their right to the protections required by this section, or for engaging in actions that are required by this section.

Note to paragraph (o): In addition, section 11(c) of the OSH Act also prohibits the employer from discriminating against an employee for exercising rights under, or as a result of actions that are required by, this section. That provision of the Act also protects the employee who files a safety and health complaint, or otherwise exercises any rights afforded by the OSH Act.

(p) *Requirements implemented at no cost to employees*. The implementation of all requirements of this section, with the exception of any employee self-monitoring conducted under paragraph (l)(1)(i) of this section, must be at no cost to employees.

(q) *Recordkeeping*.

(1) Small employer exclusion. Employers with 10 or fewer employees on the effective date of this section are not required to comply with paragraph (q)(2) or (q)(3) of this section.

(2) Required records. Employers with more than 10 employees on the effective date of this section must:

(i) retain all versions of the COVID-19 plan implemented to comply with this section while this section remains in effect.

(ii) establish and maintain a COVID-19 log to record each instance identified by the employer in which an employee is COVID-19 positive, regardless of whether the instance is connected to exposure to COVID-19 at work.

(A) The COVID-19 log must contain, for each instance, the employee's name, contact information, occupation, location where the employee worked, the date of the employee's last day at the workplace, the date of the positive test for, or

DRAFT

diagnosis of, COVID-19, and the date the employee first had one or more COVID-19 symptoms, if any were experienced.

(B) The information in the COVID-19 log must be recorded within 24 hours of the employer learning that the employee is COVID-19 positive and must be maintained as though it is a confidential medical record and must not be disclosed except as required by this ETS or other federal law.

(C) The COVID-19 log must be maintained and preserved while this section remains in effect.

Note to paragraph (q)(2)(ii): The COVID-19 log is intended to assist employers with tracking and evaluating instances of employees who are COVID-19 positive without regard to whether those employees were infected at work. The tracking will help evaluate potential workplace exposure to other employees.

(3) Availability of records. By the end of the next business day after a request, the employer must provide, for examination and copying:

(i) All versions of the written COVID-19 plan to all of the following: any employees, their personal representatives, and their authorized representatives.

(ii) The individual COVID-19 log entry for a particular employee to that employee and to anyone having written authorized consent of that employee.

(iii) A version of the COVID-19 log excluding employee names, contact information, and occupations, to all of the following: any employees, their personal representatives, and their authorized representatives.

(iv) All records required to be maintained by this section to the Assistant Secretary.

DRAFT

Note to paragraph (q): Employers must continue to record all work-related confirmed cases of COVID-19 on their OSHA Forms 300, 300A, and 301, or the equivalent forms, if required to do so under 29 CFR part 1904.

(r) *Reporting COVID-19 fatalities and hospitalizations to OSHA.*

(1) The employer must report:

(i) Each work-related COVID-19 fatality to OSHA within 8 hours of the employer learning about the fatality.

(ii) Each work-related COVID-19 in-patient hospitalization to OSHA within 24 hours of the employer learning about the in-patient hospitalization.

(2) When reporting work-related COVID-19 fatalities and in-patient hospitalizations to OSHA, the employer must follow the requirements in 29 CFR 1904.39, except for 29 CFR 1904.39(a)(1) and (2) and (b)(6).

(s) *Dates.*

(1) Effective date. This section becomes effective on [INSERT DATE OF PUBLICATION IN THE FEDERAL REGISTER].

(2) Compliance dates.

(i) Employers must comply with all requirements of this section, except for requirements in paragraph (i), paragraph (k), and paragraph (n) of this section by [INSERT DATE 14 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER].

(ii) Employers must comply with the requirements of this section in paragraph (i), paragraph (k), and paragraph (n) of this section by [INSERT DATE 30 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER].

**§ 1910.503**

DRAFT

[RESERVED]

**§ 1910.504 Mini Respiratory Protection Program.**

(a) *Scope and application*. This section applies only to respirator use in accordance with §§ 1910.501 (f)(5) and 1910.502 (f)(3)(ii) and (4).

(b) *Definitions*. The following definitions apply to this section:

*COVID-19 (Coronavirus Disease 2019)* means the respiratory disease caused by SARS-CoV-2 (severe acute respiratory syndrome coronavirus 2). For clarity and ease of reference, this section refers to "COVID-19" when describing exposures or potential exposures to SARS-CoV-2.

*Elastomeric respirator* means a tight-fitting respirator with a facepiece that is made of synthetic or rubber material that permits it to be disinfected, cleaned, and reused according to manufacturer's instructions. It is equipped with a replaceable cartridge(s), canister(s), or filter(s).

*Filtering facepiece respirator* means a negative pressure particulate respirator with a non-replaceable filter as an integral part of the facepiece or with the entire facepiece composed of the non-replaceable filtering medium.

*Hand hygiene* means the cleaning and/or disinfecting of one's hands by using standard handwashing methods with soap and running water or an alcohol-based hand rub that is at least 60% ethanol or 70% isopropanol. Hand washing with soap and running water is preferable to the use of alcohol-based hand rubs where possible.

*Respirator* means a type of personal protective equipment (PPE) that is certified by the National Institute for Occupational Safety and Health (NIOSH) under 42 CFR part 84 or is authorized under an Emergency Use Authorization (EUA) by the US Food and Drug

DRAFT

Administration. Respirators protect against airborne hazards by removing specific air contaminants from the ambient (surrounding) air or by supplying breathable air from a safe source. Common types of respirators include filtering facepiece respirators, elastomeric respirators, and PAPRs. Face coverings, facemasks, and face shields are not respirators.

*Powered air-purifying respirator (PAPR)* means an air-purifying respirator that uses a blower to force the ambient air through air-purifying elements to the inlet covering.

*Tight-fitting respirator* means a respirator in which the air pressure inside the facepiece is negative during inhalation with respect to the ambient air pressure outside the respirator (e.g., filtering facepiece).

*User seal check* means an action conducted by the respirator user to determine if the respirator is properly seated to the face.

(c) *Respirators provided by employees.* Where employees provide and use their own respirators, the employer must provide each employee with the following notice:

Respirators can be an effective method of protection against COVID-19 hazards when properly selected and worn. Respirator use is encouraged to provide an additional level of comfort and protection for workers even in circumstances that do not require a respirator to be used. However, if a respirator is used improperly or not kept clean, the respirator itself can become a hazard to the worker. If your employer allows you to provide and use your own respirator, you need to take certain precautions to be sure that the respirator itself does not present a hazard. You should do the following:

(1) Read and follow all instructions provided by the manufacturer on use, maintenance, cleaning and care, and warnings regarding the respirator's limitations.

(2) Keep track of your respirator so that you do not mistakenly use someone else's respirator.

(3) Do not wear your respirator where other workplace hazards (e.g., chemical exposures) require use of a respirator. In such cases, your employer must provide you with a respirator that is used in accordance with OSHA's respiratory protection standard (29 CFR 1910.134).

DRAFT

For more information about using a respirator, see OSHA's respiratory protection safety and health topics page (*https://www.osha.gov/respiratory-protection*).

(d) *Respirators provided by employers.* Where employers provide respirators to their employees, the employer must comply with the following requirements:

(1) Training. The employer must ensure that each employee wearing a respirator receives training prior to first use and if they change the type of respirator, in a language and at a literacy level the employee understands, and comprehends at least the following:

(i) How to inspect, put on and remove, and use a respirator;

(ii) The limitations and capabilities of the respirator, particularly when the respirator has not been fit tested;

(iii) Procedures and schedules for storing, maintaining, and inspecting respirators;

(iv) How to perform a user seal check as described in paragraph (d)(2) of this section; and

(v) How to recognize medical signs and symptoms that may limit or prevent the effective use of respirators and what to do if the employee experiences signs and symptoms.

(2) User seal check.

(i) The employer must ensure that each employee who uses a tight-fitting respirator performs a user seal check to ensure that the respirator is properly seated to the face each time the respirator is put on. Acceptable methods of user seal checks include:

(A) Positive pressure user seal check (i.e., blow air out). Once you have conducted proper hand hygiene and properly donned the respirator, place your hands over the facepiece, covering as much surface area as possible. Exhale gently into the facepiece. The face fit is considered satisfactory if a slight positive pressure is being built up inside the facepiece without any evidence of outward leakage of air at the seal. Examples of evidence that it is leaking could be the feeling of air

DRAFT

movement on your face along the seal of the facepiece, fogging of your glasses, or a lack of pressure being built up inside the facepiece. If the particulate respirator has an exhalation valve, then performing a positive pressure check may not be possible unless the user can cover the exhalation valve. In such cases, a negative pressure check must be performed.

(B) Negative pressure user seal check (i.e., suck air in). Once you have conducted proper hand hygiene and properly donned the respirator, cover the filter surface with your hands as much as possible and then inhale. The facepiece should collapse on your face and you should not feel air passing between your face and the facepiece.

(ii) The employer must ensure that each employee corrects any problems discovered during the user seal check. In the case of either type of user seal check (positive or negative), if air leaks around the nose, use both hands to readjust how the respirator sits on your face or adjust the nosepiece, if applicable. Readjust the straps along the sides of your head until a proper seal is achieved.

Note to paragraph (d)(2)(ii): When employees are required to wear a respirator and a problem with the seal check arises due to interference with the seal by an employee's facial hair, employers may provide a different type of respirator to accommodate employees who cannot trim or cut facial hair due to religious belief.

(3) Reuse of respirators.

(i) The employer must ensure that a filtering facepiece respirator used by a particular employee is only reused by that employee, and only when:

(A) the respirator is not visibly soiled or damaged;

DRAFT

(B) the respirator has been stored in a breathable storage container (e.g., paper bag) for at least five calendar days between use and has been kept away from water or moisture;

(C) the employee does a visual check in adequate lighting for damage to the respirator's fabric or seal;

(D) the employee successfully completes a user seal check as described in paragraph (d)(2) of this section;

(E) the employee uses proper hand hygiene before putting the respirator on and conducting the user seal check; and

(F) the respirator has not been worn more than five days total.

Note to paragraph (d)(3)(i): The reuse of single use respirators (e.g., filtering facepiece respirators) is discouraged.

(ii) The employer must ensure that an elastomeric respirator or PAPR is only reused when:

(A) the respirator is not damaged;

(B) the respirator is cleaned and disinfected as often as necessary to be maintained in a sanitary condition in accordance with § 1910.134 Appendix B-2; and

(C) a change schedule is implemented for cartridges, canisters, or filters.

(4) Discontinuing use of respirators. Employers must require employees to discontinue use of a respirator when either the employee or a supervisor reports medical signs or symptoms (e.g., shortness of breath, coughing, wheezing, chest pain, any other symptoms related to lung problems, cardiovascular symptoms) that are related to ability to use a respirator. Any employee who previously had a medical evaluation and was determined to not be

DRAFT

medically fit to wear a respirator must not be provided with a respirator under this standard unless they are re-evaluated and medically cleared to use a respirator.

(e) *Dates*.

(1) Effective date. This section becomes effective on [INSERT DATE OF PUBLICATION IN THE FEDERAL REGISTER].

(2) Compliance dates. Employers must comply with all requirements of this section by [INSERT DATE 14 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER].

**§ 1910.505 Severability.**

*Severability***.** Each section of this subpart U, and each provision within those sections, is separate and severable from the other sections and provisions. If any provision of this subpart is held to be invalid or unenforceable on its face, or as applied to any person, entity, or circumstance, or is stayed or enjoined, that provision shall be construed so as to continue to give the maximum effect to the provision permitted by law, unless such holding shall be one of utter invalidity or unenforceability, in which event the provision shall be severable from this subpart and shall not affect the remainder of the subpart.

**§ 1910.509 Incorporation by Reference.**

(a)(1) The material listed in this section is incorporated by reference into this subpart with the approval of the Director of the Federal Register in accordance with 5 U.S.C. 552(a) and 1 CFR part 51. To enforce any edition other than that specified in this section, OSHA must publish a document in the *Federal Register* and the material must be available to the public. All approved material is available for inspection at any Regional Office of the Occupational Safety and Health Administration (OSHA), or at the OSHA Docket Office, U.S. Department

DRAFT

of Labor, 200 Constitution Avenue, NW, Room N–3508, Washington, DC 20210; telephone: 202–693–2350 (TTY number: 877–889–5627). It is also available for inspection at the National Archives and Records Administration (NARA). For information on the availability of these standards at NARA, email fedreg.legal@nara.gov, or go to *www.archives.gov/federal-register/cfr/ibr-locations.html*.

(2) The material is available from the sources listed in this section and as follows:

(i) The material listed in paragraphs (b) and (c) of this section (CDC and EPA) is available at this permanent weblink hosted by OSHA: www.osha.gov/coronavirus/ets/ibr.

(ii) The material listed in paragraph (d) of this section (ISEA) is available from the American National Standards Institute (ANSI), 25 West 43rd Street, 4th Floor, New York, NY 10036; telephone: 212–642–4900; fax: 212–398–0023; website: *http://www.ansi.org*.

(b) Centers for Disease Control and Prevention (CDC). 1600 Clifton Road, Atlanta, GA 30329; websites: https://www.cdc.gov/https://www.cdc.gov/coronavirus/2019-ncov/communication/guidance.html and https://www.cdc.gov/infectioncontrol/guidelines/.

(1) Cleaning and Disinfecting Guidance. COVID-19: Cleaning and Disinfecting Your Facility; Everyday Step, Steps When Someone is Sick, and Considerations for Employers, updated April 5, 2021, IBR approved for §§ 1910.501(g) and 1910.502(j).

(2) COVID-19 Infection Prevention and Control Recommendations. COVID-19: Interim Infection Prevention and Control Recommendations for Healthcare Personnel During the Coronavirus Disease 2019 (COVID-19) Pandemic," updated February 10, 2021, IBR approved for §§ 1910.502(d) and (j).

DRAFT

(3) Guidelines for Isolation Precautions, 2007 Guideline for Isolation Precautions: Preventing Transmission of Infectious Agents in Healthcare Settings, dated 2007, updated July 2019, IBR approved for §§ 1910.502(e) and 1910.502(f).

(4) Guidelines for Environmental Infection Control. Guidelines for Environmental Infection Control in Health-Care Facilities, updated July 2019, IBR approved for § 1910.502(j).

(5) Isolation Guidance, (February 2021). COVID-19: Isolation If You Are Sick; Separate yourself from others if you have COVID-19, updated February 18, 2021, IBR approved for §§ 1910.501(i) and 1910.502(l).

(6) Isolation Discontinuation Non-Healthcare Guidance. COVID-19: Discontinuation of Isolation for Persons with COVID-19 Not in Healthcare Settings," updated December 3, 2020, IBR approved for § 1910.501(i).

(7) Return to Work Healthcare Guidance. COVID-19: Criteria for Return to Work for Healthcare Personnel with SARS-CoV-2 Infection (Interim Guidance), updated August 10, 2021, IBR approved for § 1910.502(l).

(c) U.S. Environmental Protection Agency (EPA): 1200 Pennsylvania Avenue, NW, Washington, DC 20460; website: https://www.epa.gov/.

(1) List N. Pesticide Registration List N: Disinfectants for Coronavirus (COVID-19), updated December 15, 2020 (www.epa.gov/pesticide-registration/list-n-disinfectants-coronavirus-covid-19), updated December 15, 2020, IBR approved for §§ 1910.501(b) and 1910.502(b).

(2) [Reserved]

(d) International Safety Equipment Association (ISEA): 1901 North Moore Street, Suite 808, Arlington, VA 22209; website: www.safetyequipment.org

DRAFT

(1) ANSI/ISEA Z87.1-2010, American National Standard for Occupational and Educational Personal Eye and Face Protection Devices, ANSI-approved April 13, 2010, incorporation by reference (IBR) approved for §§ 1910.501(b) and 1910.502(b).

(2) ANSI/ISEA Z87.1-2015, American National Standard for Occupational and Educational Personal Eye and Face Protection Devices, ANSI-approved May 28, 2015, IBR approved for §§ 1910.501(b) and 1910.502(b).

(3) ANSI/ISEA Z78.1-2020, American National Standard for Occupational and Educational Personal Eye and Face Protection Devices, ANSI-approved March 11, 2020, IBR approved for §§ 1910.501(b) and 1910.502(b).

**PART 1915—OCCUPATIONAL SAFETY AND HEALTH STANDARDS FOR SHIPYARD EMPLOYMENT**

2. The authority citation for part 1915 is revised to read as follows:

**Authority:** 33 U.S.C. 941; 29 U.S.C. 653, 655, 657; Secretary of Labor's Order No. 12-71 (36 FR 8754); 8-76 (41 FR 25059), 9-83 (48 FR 35736), 1-90 (55 FR 9033), 6-96 (62 FR 111), 3-2000 (65 FR 50017), 5-2002 (67 FR 65008), 5-2007 (72 FR 31160), 4-2010 (75 FR 55355), 1-2012 (77 FR 3912), or 8-2020 (85 FR 58393); 29 CFR part 1911; and 5 U.S.C. 553, as applicable.

**Subpart Z – Toxic and Hazardous Substances**

3. Add §1915.1501 to subpart Z to read as follows:

**§ 1915.1501 COVID-19 Emergency Temporary Standard.**

The requirements applicable to shipyard employment under this section are identical to those set forth at 29 CFR 1910 Subpart U.

**PART 1917—MARINE TERMINALS**

DRAFT

4. The authority citation for part 1917 is revised to read as follows:

**Authority:** 33 U.S.C. 941; 29 U.S.C. 653, 655, 657; Secretary of Labor's Order No. 12-71 (36 FR 8754), 8-76 (41 FR 25059), 9-83 (48 FR 35736), 1-90 (55 FR 9033), 6-96 (62 FR 111), 3-2000 (65 FR 50017), 5-2002 (67 FR 65008), 5-2007 (72 FR 31160), 4-2010 (75 FR 55355), 1-2012 (77 FR 3912), or 8-2020 (85 FR 58393), as applicable; and 29 CFR part 1911.

Sections 1917.28 and 1917.31 also issued under 5 U.S.C. 553.

Section 1917.29 also issued under 49 U.S.C. 1801-1819 and 5 U.S.C. 553.

**Subpart B – Marine Terminal Operations**

5. Add § 1917.31 to subpart B to read as follows:

**§ 1917.31 COVID-19 Emergency Temporary Standard.**

The requirements applicable to marine terminal work under this section are identical to those set forth at 29 CFR 1910 Subpart U.

**PART 1918—SAFETY AND HEALTH REGULATIONS FOR LONGSHORING**

6. The authority citation for part 1918 is revised to read as follows:

**Authority:** 33 U.S.C. 941; 29 U.S.C. 653, 655, 657; Secretary of Labor's Order No. 12-71 (36 FR 8754), 8-76 (41 FR 25059), 9-83 (48 FR 35736), 1-90 (55 FR 9033), 6-96 (62 FR 111), 3-2000 (65 FR 50017), 5-2002 (67 FR 65008), 5-2007 (72 FR 31160), 4-2010 (75 FR 55355), 1-2012 (77 FR 3912), or 8-2020 (85 FR 58393), as applicable; and 29 CFR 1911.

Sections 1918.90 and 1918.110 also issued under 5 U.S.C. 553.

Section 1918.100 also issued under 49 U.S.C. 5101 et seq. and 5 U.S.C. 553.

7. Add subpart K to read as follows:

**Subpart K – COVID-19 Emergency Temporary Standard**

Secs. 1918.107 -- 1918.109 [Reserved]

DRAFT

Sec. 1918.110 COVID-19 Emergency Temporary Standard

§§ 1918.107 through 1918.109 [Reserved]

**§ 1918.110 COVID-19 Emergency Temporary Standard.**

The requirements applicable to longshoring work under this section are identical to those set forth at 29 CFR 1910 Subpart U.

**PART 1926—SAFETY AND HEALTH REGULATIONS FOR CONSTRUCTION**

8. The authority citation for part 1926 is revised to read as follows:

**Authority:** 40 U.S.C. 3704; 29 U.S.C. 653, 655, and 657; and Secretary of Labor's Order No. 12-71 (36 FR 8754), 8-76 (41 FR 25059), 9-83 (48 FR 35736), 1-90 (55 FR 9033), 6-96 (62 FR 111), 3-2000 (65 FR 50017), 5-2002 (67 FR 65008), 5-2007 (72 FR 31159), 4-2010 (75 FR 55355), 1-2012 (77 FR 3912), or 8-2020 (85 FR 58393), as applicable; and 29 CFR part 1911.

Sections 1926.58, 1926.59, 1926.60, and 1926.65 also issued under 5 U.S.C. 553 and 29 CFR part 1911.

Section 1926.61 also issued under 49 U.S.C. 1801-1819 and 5 U.S.C. 553.

Section 1926.62 also issued under sec. 1031, Public Law 102-550, 106 Stat. 3672 (42 U.S.C. 4853).

Section 1926.65 also issued under sec. 126, Public Law 99-499, 100 Stat. 1614 (reprinted at 29 U.S.C.A. 655 Note) and 5 U.S.C. 553.

**Subpart D – Occupational Health and Environmental Controls**

9. Add § 1926.58 to read as follows:

**§ 1926.58 COVID-19 Emergency Temporary Standard.**

DRAFT

The requirements applicable to construction work under this section are identical to those set forth at 29 CFR 1910 Subpart U.

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**PART 1928—OCCUPATIONAL SAFETY AND HEALTH STANDARDS FOR AGRICULTURE**

10. The authority citation for part 1928 is revised to read as follows:

**Authority:** Sections 4, 6, and 8 of the Occupational Safety and Health Act of 1970 (29 U.S.C. 653, 655, 657); Secretary of Labor's Order No. 12-71 (36 FR 8754), 8-76 (41 FR 25059), 9-83 (48 FR 35736), 1-90 (55 FR 9033), 6-96 (62 FR 111), 3-2000 (65 FR 50017), 5-2002 (67 FR 65008), 4-2010 (75 FR 55355), or 8-2020 (85 FR 58393), as applicable; and 29 CFR 1911.

Section 1928.21 also issued under 49 U.S.C. 1801-1819 and 5 U.S.C. 553.

**Subpart B – Applicability of Standards**

11. Amend § 1928.21 by adding paragraph (a)(8) to read as follows:

**§ 1928.21 Applicable standards in 29 CFR part 1910.**

* * *

(8) COVID-19 Emergency Temporary Standard — part 1910 Subpart U, but only with respect to –

(i) agricultural establishments where eleven (11) or more employees are engaged on any given day in hand-labor operations in the field; and

(ii) agricultural establishments that maintain a temporary labor camp, regardless of how many employees are engaged on any given day in hand-labor operations in the field.

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