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U.S. Occupational Safety and Health Administration (OSHA)
OSHA Docket Office, Technical Data Center, Room N-2625
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, D.C. 20210

RE: Occupational Safety and Health Administration -- Heat Injury and Illness Prevention in
Outdoor and Indoor Work -- [Docket No. OSHA–2021–0009], RIN 1218–AD39

To Whom it May Concern:

The **American Forest & Paper Association (AF&PA)** and the **American Wood Council (AWC)** appreciate the opportunity to provide the U.S. Occupational Safety and Health Administration (OSHA) our perspective, comments, and recommendations in response to the above-referenced advance notice of proposed rulemaking (“ANPRM”) on heat injury and illness prevention.

The **American Forest & Paper Association (AF&PA)** serves to advance a sustainable U.S. pulp, paper, packaging, tissue and wood products manufacturing industry through fact-based public policy and marketplace advocacy. AF&PA member companies make products essential for everyday life from renewable and recyclable resources and are committed to continuous improvement through the industry’s sustainability initiative — *Better Practices, Better Planet 2030: Sustainable Products For A Sustainable Future*. The third essential pillar of sustainability -- social – recognizes that “safety isn’t just a goal, it’s a mindset for our industry.” The forest products industry accounts for approximately four percent of the total U.S. manufacturing GDP, manufactures nearly \$300 billion in products annually and employs approximately 950,000 men and women. The industry meets a payroll of approximately \$55 billion annually and is among the top 10 manufacturing sector employers in 45 states.

The **American Wood Council (AWC)** is the voice of North American wood products manufacturing, an industry that provides over 450,000 men and women in the United States with family-wage jobs. AWC represents 86 percent of the structural wood products industry, and members make products that are essential to everyday life from a renewable resource that

absorbs and sequesters carbon. Staff experts develop state-of-the-art engineering data, technology, and standards for wood products to assure their safe and efficient design, as well as provide information on wood design, green building, and environmental regulations.

Overarching key points:

- Before responding to the below subset of OSHA questions, AF&PA and AWC want to be clear that we categorically recognize the importance of protecting workers from heat-related injuries and illnesses and are working to accomplish this crucial objective in a practical, reliable, scientifically sound, and cost-effective manner.
- We recognize that, given current technology, this may be one of the most technically challenging hazards for OSHA to address in a manner that meets the legal criteria established by Section 6(b)(5) of the Occupational Safety and Health (OSH) Act.
 - As explained by the National Institute of Occupational Safety & Health (NIOSH),¹ the impact of heat exposure in causing heat illness depends on its effect on the core temperature of the body.
 - We are not aware of any currently available, reasonably-priced, validated, non-intrusive technology for continuous (direct or indirect) real-time measurement of the core temperature of the body.²
 - OSHA could attempt to develop and validate a complex model that takes all of the relevant factors into account to determine the effect of performing a task under certain conditions on the core temperature of the body, and then base a permissible exposure limit (PEL) and possibly an action level (AL) on that model.
 - However, application of the model would require sophisticated and expensive equipment (hardware and software) that would have to be calibrated and used by qualified personnel based on the careful selection and/or collection of widely varying data from a dynamic environment to ensure the analysis is representative of all tasks and jobs or covers all tasks and jobs under all relevant conditions.
 - These considerations appear to limit both the ability of an employer to comply with a traditional PEL-based heat stress standard and the ability of OSHA to enforce a traditional PEL-based heat stress standard. They suggest that, if OSHA is to proceed with a standard, at least until there is an advancement in the available technology, some unique screening-based approach may be necessary. In theory, it appears that is what has been done by the state plans that have adopted heat

¹Criteria for a Recommended Standard Occupational Exposure to Heat and Hot Environments (*NIOSH*) www.cdc.gov/niosh/docs/2016-106/pdfs/2016-106.pdf

² The 3M™ QUESTEMP II Personal Heat Stress Monitor appears to have offered an ear canal sensor inside a hearing protection plug, but it was discontinued. <https://tsi.com/discontinued-products/questemp-ii-personal-heat-stress-monitor/> <https://multimedia.3m.com/mws/media/7608360/3m-questemp-ii-heat-stress-monitor-user-manual.pdf> (manual).

illness prevention standards, but those states are not subject to the rulemaking criteria of Section 6(b)(5) of the OSH Act as interpreted by the courts.

- The challenge is to develop a standard that would adequately protect employees but would not be overly burdensome from the standpoint of compliance and not subject employers to inappropriate citations for non-compliance with a significantly excessive standard created out of administrative convenience.
- Any OSHA rule should be performance-based and provide employers with the ability to determine what measures would most cost-effectively protect their employees – e.g., job rotation, frequency and/or duration of breaks, work/rest schedules, fans, evaporators, introduction of conditioned air.
- Employers should be given the option to implement a very basic heat illness prevention program to cover employees exposed at an appropriate triggering dry bulb temperature for a meaningful period of time while offering the employer the option of applying more precise screening tools or analyses to determine whether additional measures are needed and what measures would be most cost-effective in protecting employees. OSHA should exclude routine short-term exposures such as walking between buildings or parking lots and consider a minimum time threshold per workday for application of the regulation, or possibly a set of time triggers tied to different temperatures. Rather than a single triggering temperature, it may be more appropriate to consider using a threshold that is based on deviation from “normal” and not a set temperature.
- A more extensive heat illness prevention program might be appropriate to cover employees exposed at certain elevated dry bulb temperatures for a meaningful period of time while offering the employer the option of applying more precise screening tools or analyses to determine whether additional measures are actually needed and what measures would be most cost-effective in protecting employees. Requiring that sites use more complex indices or collect physiological metric data from employees, particularly in real time, would likely prove overly burdensome and collection of physiological metric data would raise significant personal privacy and medical confidentiality issues.
- Any OSHA rule should focus on outdoor rather than indoor heat exposure because those employees generally have limited to no access to shade or air-conditioning, and the risk and incidence rates for outdoor heat illness are significantly greater. In addition, employers would not be able to rely on the data available from the National Weather Service and other publicly available sites to address indoor exposures.
- The distinction between acclimatized and unacclimatized is essential because “an acclimatized worker can tolerate a greater heat stress before a harmful level of heat strain occurs.” Currently available criteria for heat stress vary significantly. Some are overprotective for acclimatized employees and under protective for non-acclimatized employees.

- Consistent with the concept of acclimatization, the requirements of any OSHA standard should reflect the region of the country in which the facility is located as well as the season of the year.

AF&PA-AWC Responses to a Subset of OSHA’s Questions:

(10) In addition to traditional work arrangements, are there specific types of work arrangements or multi-employer work arrangements that should be considered when evaluating the health and safety impacts of hazardous heat exposure in indoor and outdoor work environments?

- Any rule should exclude employees who work at home or at other locations selected by the employee, which are not under the control of the employer.

(18) What regional differences [in heat hazard patterns] should be considered or accounted for when determining the appropriate interventions and practices to prevent heat-related injuries and illnesses among workers?

- Workers in hot, humid regions are more acclimatized than those in other regions.
- OSHA should consider using a temperature threshold that is based on deviation from “normal” and not a set temperature.

(28) What additional efforts or improvements should be undertaken by OSHA to protect workers from hazardous heat in indoor and outdoor work settings?

- We encourage additional OSHA outreach and partnerships with industries in which there is a significantly greater risk of heat illness.

(34) Would any of the elements of the state standards not be feasible to include at the Federal level?

- The temperature and/or heat index trigger levels in some existing state plans may be appropriate in some regions of the country but not others. (See Question 18).
- While we recognize that state plan rules must be as effective as the corresponding Federal rule, this is one area where OSHA should carefully consider whether differences between any Federal rule and the state plan rule are justified by regional differences in weather conditions.

(36) Are there other industry standards that contain elements that should be considered for a federal standard?

Elements of the following recognized standards should be assessed but not necessarily included in a federal standard.

- *ISO 7243:2017 Ergonomics of the thermal environment — Assessment of heat stress using the WBGT (wet bulb globe temperature) index.* The abstract and introduction of this standard state:
- ISO 7243:2017 presents a **screening method** [emphasis added] for evaluating the heat stress to which a person is exposed and for establishing the presence or absence of heat stress.
 - ISO 7933:2004 specifies a method for the analytical evaluation and interpretation of the thermal stress experienced by a subject in a hot environment. It describes a method for predicting the sweat rate and the internal core temperature that the human body will develop in response to the working conditions.
 - ISO 7933:2004 does not predict the physiological response of individual subjects, but only considers standard subjects in good health and fit for the work they perform. It is therefore intended to be used by ergonomists, industrial hygienists, etc., to evaluate working conditions.
- ISO 7933:2004 Ergonomics of the thermal environment — Analytical determination and interpretation of heat stress using calculation of the predicted heat strain. The abstract of this standard, which is undergoing revision,³ states:
 - American Conference of Governmental Industrial Hygienists (ACGIH) Threshold Limit Values (TLV).
 - National Institute for Occupational Safety & Health (NIOSH) Criteria for a Recommended Standard Occupational Exposure to Heat and Hot Environments.⁴

(37) Are there elements of these standards that would not be appropriate or feasible for a federal heat standard?

- Heat load monitoring, physiologic monitoring, prescriptive work/rest cycles, medical monitoring program.
- Do not require employers to know or assess health status, including pre-existing conditions, of workers exposed to heat

³ The proposed revised standard, ISO/DIS 7933.2, is in the voting process; voting terminates January 7, 2022.

⁴ <https://www.cdc.gov/niosh/docs/2016-106/pdfs/2016-106.pdf>

(38) What efforts are employers currently taking to prevent occupational heat-related illness in their workplace? Please provide examples and data.

- Member companies report that they provide employee awareness training before exposure to tasks presenting heat stress. Some member companies report initiating some type of significant refresher communication campaign or training prior to the seasonal onset of work conditions posing potential heat stress. Employee awareness of the hazards of heat stress, and its signs and symptoms is crucial – both for self-monitoring and for observing co-workers.
- Examples of the broad range of other protective measures taken by our members are described in response to Question 59.

(41) What are the advantages and disadvantages of using each of these metrics (e.g., ambient temperature, heat index, WBGT) in indoor and outdoor work settings? Are there any challenges associated with training employers and employees on these different metrics?

- Reliance on ambient (dry bulb) temperature is clearly the simplest but least precise screening measure that can be used by employers and employees to identify conditions triggering implementation of control measures. To the extent a metric is scientifically validated, each increase in the complexity of the triggering metric (from ambient temperature to NWS Heat Index to WBGT), would bring a greater level of precision so as to reduce the potential for overinclusion or under inclusion, but with a correspondingly greater compliance burden in terms of equipment requirements (hardware, software, calibration and training), acquiring the necessary data and applying and interpreting the metric. In some situations, it may be possible to use area-based data for purposes of implementing effective control measures. In other situations, use of more complex measures to trigger or manage control measures would require job-specific or task-specific analyses under varying environmental, work and clothing conditions. In many environments, such an approach is likely to be overly burdensome. Particularly given current technology, collecting physiological metric data from employees would be exceedingly burdensome, would be of uncertain value and would raise significant privacy and confidentiality concerns.
- Litigation of OSHA heat illness citations under the General Duty Clause resulted in Review Commission decisions concluding that the NWS Heat Index has not been validated as a model for identifying hazardous exposures to heat stress. Even if it was validated, online Heat Index and wind sources typically would provide data from the nearest city and would not necessarily represent conditions at an employer's worksite located away from the weather monitoring center. Wind and shade conditions can be dramatically different on different sides of the same building.

- In the absence of reliable online data for the employer’s workplace, determination of the Heat Index would require specialized equipment to measure the temperature and relative humidity. This would require equipment calibration, training on the equipment, and calculations or use of a computer application to determine the Heat Index.
- If temperature thresholds are used, OSHA should consider basing them on deviation from normal rather than on fixed temperatures. Regional climates can vary (Alaska vs Alabama), and a single temperature would not be a cost-effective method of preventing heat illness for the entire country.

(55) What are the elements of a successful employer-led heat injury and illness prevention program? How are these programs implemented? What are the challenges associated with them? Please provide examples and data.

- The most cost-efficient heat illness prevention programs are performance based to provide the flexibility needed to most appropriately address the tasks and conditions at each site. This allows employers to increase or decrease the level of applied controls as appropriate based on the level of the hazard and evaluation of the effectiveness of the measures as determined through monitoring, feedback from employees and other relevant indicators.
- Training in advance of working in conditions presenting potential heat stress is essential. The training must effectively inform employees of the hazard and risks, so they understand the importance of being fully compliant, and have the knowledge and judgment necessary to recognize early signs of heat effects in themselves and co-workers, and take proactive preventive measures.

(59) What engineering controls, administrative controls, or PPE can be used to prevent heat-related illness in indoor and outdoor work settings? Have the qualitative or quantitative effectiveness of these controls been evaluated?

Commonly used control measures include the following:

- Fans, swamp coolers (aka, evaporative coolers), portable air conditioners, access to air-conditioned zones, air-conditioned tents/trailers, increased access to hydration, evaporative cooling gear.
- Appropriate work/break ratio or job rotation, which varies with conditions and tasks.
- Acclimatization is widely used for new and return-to-work employees where that is an appropriate approach. Members may rely on variation in breaks, job rotation or other

measures in situations where acclimatization is impractical and/or ineffective – e.g., for short heat events. According to the ISO⁵:

- “Acclimatized persons are able to sweat more abundantly, more uniformly on their body surface and earlier than unacclimatized persons.”
 - “In a given work situation, this results in lower heat storage (lower core temperature) and lower cardiovascular strain (lower heart rate).”
 - “Acclimatized persons are known to lose less salt through sweating and therefore to be able to endure a greater water loss.”
- Controls that rely on web or App-based sources (like NIOSH App) will not have service at remote locations.
 - Workload/exertion and PPE need to be a factor in when and what controls need to be implemented.
 - Workplace should have a heat stress management plan including training, but only at a specific threshold temperature and duration (i.e., reasonable possibility that temperatures will exceed a certain temperature for more than a specific duration of time).
 - Due to the demands on supervisors, it is not feasible for a supervisor to observe or monitor the status of all employees for heat stress on an ongoing basis. Supervisors should be able to rely on training of employees, spot checks and an expectation that employees will look out for their fellow employees during potential heat stress conditions.
 - It would be inappropriate for OSHA to, in effect, impose accommodation requirements on employers to, for example, implement mandatory controls at lower temperature thresholds for employees with specific health conditions, or require actions for a sub-set of the employee population that would require the employer know an employee’s health status.

(61) Are certain controls more effective or more feasible than others? If so, which ones? Do effectiveness and feasibility of controls differ due to setting (indoor/outdoor, business size, arrangement of work, etc.)?

- Each control has its own degree of effectiveness that must be understood. Additionally, controls work well in conjunction with others.

⁵ ISO 7933:2004, p. 18.

(62) What are the limitations associated with implementing water, rest, and shade effectively:

(a) in indoor settings?

- Water consumption in some manufacturing environments is limited to avoid creating additional hazards (e.g., no water in electrical rooms, no consumption of anything in a chemical mix room, etc.) but is managed with adequate frequency and duration of breaks.

(b) in outdoor settings?

- For remote locations, recognize that natural shade can be provided by trees and water must be transported in.

(84) How do organizations in both indoor and outdoor work environments currently deal with heat-illness emergencies if they arise?

- Heat illness emergencies are included in emergency response planning, with the first aid and medical emergency response elements.

(91) How do employers currently involve workers in heat injury and illness prevention?

- Heat injury and illness awareness is included in the pre-job safety assessments, EHS work plans, and training.
- Employees are encouraged and expected to stop work when they sense that is needed and to be conservative when making that self-assessment.
- Employees are encouraged and expected to watch out for each other for the mutual benefit of all.

(95) What challenges are there with worker training and engagement for heat injury and illness prevention?

- It is important to include the potential impact of personal health status and conditions in awareness training and encourage employees to seek medical assessment for pre-existing conditions while avoiding a public discussion of an employee's health status.
- It is important that the training cover the signs and symptoms of heat-related illnesses in a manner suited to the audience and not get caught up in complicated medical terminology.

AF&PA|AWC Comments – Heat Injury and Illness ANPRM

- It is important to persuade employees that, regardless of their apparent good health, athletic abilities, endurance, etc., they can be seriously adversely affected by heat stress.

We appreciate the opportunity to provide OSHA with our comments.

Respectfully submitted,

Paul Noe

On behalf of

AMERICAN FOREST & PAPER ASSOCIATION

AMERICAN WOOD COUNCIL