

CLIMATE HAZARD ESCALATION & ACCEPTABLE RISK

By Scott Gunderson

The smoke drifted miles from the distant forest fires, coloring the sky silver like cigarette ash. The wind carried a dry odor and the taste of charcoal. Online maps showed air quality deteriorating across the region, with the largest cities in the state in the path of the oncoming plume (Gunderson, 2023).

The author and the general manager met inside the office, looking at the haze outside the windows, and discussed the new state OSHA regulations for wildfire smoke exposure: NIOSH-approved filtering facepieces were available for optional use by employees at lower levels of the air quality index, but at a higher threshold, NIOSH-approved respirators would be mandatory. This mandatory use would need to be implemented within the scope of a respiratory protection program including medical evaluation and fit testing. The general manager considered hundreds of employees wearing respirators and decided that if the air quality degraded to the threshold requiring respiratory protection, they would declare a weather emergency and temporarily close the location.

The long-distance spread of wildfire smoke is another sign of climate change and the escalation of climate hazards, with record heat and poor air quality in 2024 continuing into 2025 (NASA, 2025; NOAA, 2025a, 2025b; UN, 2025; WMO, 2025, 2026). This escalation is expected to continue (IPCC, 2023). In this environment, occupational EHS professionals must assess and evaluate risk with an obligation to anticipate changing climate conditions and regularly reassess future risk (Gunderson, 2024). Standards for risk assessment have been established and are available for general use (ANSI/ASSP/ISO, 2018, 2019). Additionally, occupational EHS professionals can integrate standards specific to climate change in their assessments of climate risk for the organizations they support (ISO, 2021).

A complete risk assessment includes recognition of acceptable risk, typically after establishing controls to reduce the risk as low as practicable (Manuele, 2010). Even with controls, however, some risks may still be unacceptably high, and organizational leaders may decide to discontinue or not engage in the activity (Lyon, 2023; Lyon & Popov,

2018). Senior leaders within an organization are responsible for balancing tactical and strategic goals, assessing both positive and negative potential outcomes, defining and communicating acceptable risk, and monitoring activities to verify that performance meets expectations (Bordner, 2023; IRM, 2011; Straub, 2024; Whiting, 2023).

During the risk assessment, identified hazards can be rated based on their estimated likelihood and severity of exposure in a risk matrix (Lyon & Popov, 2018). Stakeholders leading and participating in the risk assessment can use this resource to identify what level of risk they are prepared to accept. For example, one organization using the risk matrix in Table 1 may accept no risk at a rating of six or higher, while another organization using the same risk matrix may also refuse to accept any risk with a high likelihood. Each organization will likely approach controls or avoidance differently.

A formal risk assessment including use of a risk matrix may not be necessary or feasible, depending on the complexity of the issue, the speed of onset and the available resources. When the author and the general manager discussed the oncoming wildfire smoke, there was no assessment of likelihood and severity of the health risk of the increasing levels of smoke. Instead, the general manager selected an upper limit and drew a line in the sand that they were not willing to cross (Table 2, p. 42).

But acceptable risk may not fall on a fixed line that is consistent across organizations, and leaders at different organizations identify different levels of acceptable and unacceptable risk, drawing their own lines in the sand and aligning response to risk within their own levels of tolerance (Figure 1, p. 42). Acceptable risk at one organization may be unacceptable at another organization; this is the reason for the color gradation instead of defined rows in Table 2 (p. 42) and Figure 1. Consider the example of a forecasted heat wave with models predicting unprecedented high temperatures:

- Two organizations are in states without heat illness prevention rules. Leaders at one organization, with no regulatory accountability and indifferent to the risk, decide to continue work with no additional controls for the prevention of heat illness; the author does not recommend this approach. Leaders at the second organization, despite the absence of regulations, adopt best practices from the NIOSH recommended standard for work in hot environments (Jacklitsch et al., 2016).

- Three organizations are in states with heat illness prevention rules. Leaders at one organization, unaware or dismissive of the rules, decide to continue work without complying with the rules; the author does not recommend this approach. At another organization, leaders decide to continue work, complying with the rules. And at the third

TABLE 1
EXAMPLE RISK MATRIX

		Severity		
		Minimal	Serious	Fatal
Likelihood	Low	1	2	3
	Medium	2	4	6
	High	3	6	9

TABLE 2
EXAMPLE RANGE OF ACCEPTABLE RISK

Example range of acceptable risk for implementing respiratory protection for wildfire (Oregon OSHA, 2022b, 2024a, 2024b).

Air Quality Index	Oregon OSHA wildfire smoke respiratory protection requirements	Acceptance	Actions
849 or greater	Provide NIOSH-approved respirators for mandatory use compliant with OSHA respiratory protection rules	Unacceptable	Declare weather emergency; temporarily close location
277 to 848	Provide NIOSH-approved filtering facepieces for mandatory use; implement a Wildfire Smoke Respiratory Protection Program per the Oregon OSHA wildfire smoke protection rule		
101 to 276	Provide NIOSH-approved filtering facepieces for voluntary use	Acceptable	Comply with Oregon OSHA regulations

organization, leaders continue work complying with the rules and integrating best practices such as workplace monitoring by a designated competent person (ANSI/ASSP, 2024).

- Leaders at a final organization deem the risk too high for reasons such as work intensity, work clothing and PPE interfering with individual evaporative cooling, or low levels of worker acclimatization to high heat. Daytime work is suspended, and work on night shift is closely monitored to verify acceptable exposure to heat.

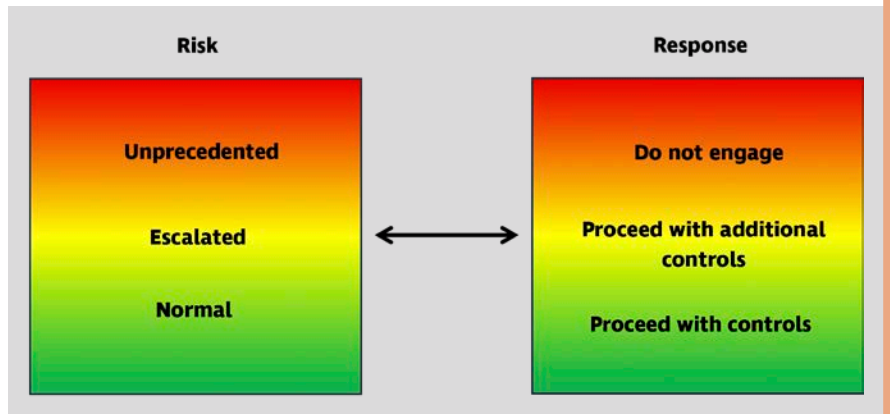
The different responses to risk in these examples demonstrate the range of potential actions at locations where there may or may not be regulations for hazards such as high heat:

- No additional controls where there are no rules requiring them. The author does not recommend this approach.
- Noncompliance with rules at locations where regulations exist. The author also does not recommend this approach.
- Compliance with rules at locations where regulations exist. This is a baseline expectation for organizations.
- Adoption of best practices where no regulations exist.
- Adoption of best practices in addition to applicable regulations.
- Identification of unacceptable risk.

Establish additional controls or decide to not engage with the hazard.

Much of this is already happening as organizations navigate an environment of escalating climate hazards: construction and agricultural activities in some

FIGURE 1
ALIGNING RESPONSE TO RISK



areas are moving to cooler morning and night hours to avoid exposure to high heat (Fischer, 2025; Horn-Muller, 2024). Leaders in other industries such as performing arts and entertainment are evaluating the feasibility of summer concerts (Taysom, 2025a, 2025b). College and professional sports continue to be challenged, with some organizations seeing criticism for poorly implemented or poorly communicated plans for responding to hazards such as heat and smoke (AP, 2025; Coughlan et al., 2023; Timms, 2025).

During a 2021 heat wave in the Pacific Northwest with unprecedented high temperatures, the author saw local businesses and neighborhood restaurants respond in real time, posting on social media that they were temporarily closing due to the

heat (Hoffman, 2025; Jackson-Glidden, 2021a, 2021b). What was once unprecedented is now experience. Occupational EHS professionals can no longer assume stable climate conditions and must instead reassess risk considering new information:

The validity of using past data depends strongly on being assured that past and current circumstances have not changed and their future effects will remain the same. . . . New emergent or previously neglected scenarios result in variations outside the experience base of past historical happenings. (Whiting, 2023)

With climate projections showing increasing frequency and severity of

hazards such as heat and wildfire smoke, occupational EHS professionals have a duty to assess future risk for the workers and organizations they support (Gunderson, 2024). Assessing future risk in a changing climate, occupational EHS professionals must recommend plans for responding to escalating hazards, including establishing plans for additional controls and identification of risks too high to accept. **PSJ**

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