

EXTREME WEATHER

Prepare, Respond & Recover to Handle Environmental Conditions

By Joseph A. Knickerbocker

Natural disasters can present hazards that push the limits of or go beyond human control. Safety professionals must respect the power of extreme environmental conditions and events, and prepare to respond to them appropriately to ensure worker safety.

Extreme temperatures, wind, precipitation, lightning, wildfires, earthquakes and volcanoes are just some of the manifestations of the earth's awesome power that affect us. Just as the prepare-respond-recover framework can be valuable for safety professionals in helping their teams address incidents in the workplace (Knickerbocker, 2024), this same model can be applied to dealing with these and other natural events.

Prepare: Understand Risks

When moving into a new office location or beginning a construction project, it is important to assess the local conditions. Is the location close to forests, mountainsides or riverbeds? What is the risk of flooding? Do tornadoes frequently occur in the area? Could nearby buildings or operations impact the site or the facility in the event of a natural disaster?

Review company policies regarding adverse weather and environmental conditions or, if one is not already in place, add a policy to address these issues. It is also a good idea to reach out to insurance representatives, as they can help identify and prepare for the risks unique to specific exposures, locations and climates. Once potential natural hazards have been identified, prepare to address them. Exposures for a construction site vary throughout the life of the project. Under EPA regulations, construction projects may be required to implement a stormwater pollution prevention plan (EPA, 2023). As part of this plan, best management practices for controlling water and its potential pollutants should be established before earth work begins.

Stay abreast of forecasted weather conditions and communicate them to all on-site stakeholders, employees and trade partners. Maintain good housekeeping and material storage. Stay vigilant and maintain access and egress, preserving the flow of both foot and vehicle traffic especially in the event of an emergency.

Respond: Act to Preserve Human Life

Remember that the top priority is to preserve human life, starting with yourself.

A safety professional cannot be the hero their team needs if they allow themselves to be severely injured or killed. After providing initial first aid and as soon as response resources allow, begin documenting the occurrence of injury or illness in accordance with company incident reporting procedures. Report all property damage as required after ensuring human safety. The following sections offer general guidelines for responding to several types of hazards. The risk level for different types of hazards, such as wildfires and earthquakes, vary based on geographic location. If risk is high, pay attention to local authorities and their recommendations and evacuation notifications, and ensure that employees, trade partners and other stakeholders are notified accordingly.

Extreme Temperatures

When it comes to extreme temperatures, maintaining core body temperature is key. In extreme heat (above 85 °F), drink plenty of water and electrolyte-rich fluids such as sports drinks or coconut water. Avoid caffeine, which is a diuretic and reduces the body's ability to self-cool. Take needed breaks to access shade or air conditioning. It takes a few weeks to acclimate to high temperatures, so it is important for teams to watch out for each other, especially people new to the crew or project. Signs of heat stress include headache, nausea, dizziness, weakness, irritability, thirst, heavy sweating and cramps (CDC, 2024c). If you or another person is experiencing any of these symptoms, provide first aid by moving to a cool place, loosening clothing and increasing hydration, and report it to site management.

Heat stress can escalate into heat stroke if not addressed quickly, which can be fatal. Signs of heat stroke include, throbbing headache, confusion, body temperature above 103 °F, rapid and strong pulse, loss of consciousness or altered levels of consciousness, and hot, red, dry or damp skin. If initial attempts to manage heat stress through hydration and air conditioning fail, and signs of heat stroke are observed, immediately call 9-1-1 or the

local emergency number for advanced medical assistance and make every effort to rapidly cool the person.

Long exposure to direct sunlight can cause sunburn (solar erythema). Take extra precautions such as wearing sun visors, long sleeves or sunblock.

In extreme cold, wear appropriate clothing. Keep the outside of the body dry and the inside hydrated to help maintain a safe core body temperature in the cold. Hypothermia occurs when the body begins to lose heat faster than it is produced. The risk of hypothermia is not completely absent at higher temperatures, but the risk is particularly high at temperatures below 40 °F. Symptoms of hypothermia include shivering, exhaustion, confusion, fumbling hands, memory loss, slurred speech and drowsiness (CDC, 2024b). These symptoms may impair a person's judgment, so teams should watch out for each other when working in extreme cold. If someone is experiencing any of these symptoms, take appropriate action to help the individual warm up. If the affected individual's core body temperature cannot be raised or drops below 95 °F, hypothermia becomes a life-threatening condition and emergency services should be called.

Frostbite is a type of injury caused by the freezing of soft tissue. Signs and symptoms of frostbite include white or grayish-yellow skin, blistering, skin that feels unusually firm or waxy, and numbness (CDC, 2024a). If frostbite is detected, provide first aid and use warming techniques such as soaking the affected area in warm water. Using clean warm water will help to avoid rubbing off blisters or causing further harm. Severe cases require medical attention.

Wind

Most projects experience various levels of wind. In some cases, wind may occur in combination with other elements such as dust, snow or hail. Secure material and use industry best practices to work safely during windy conditions. How much wind is too much? While there is some subjectivity depending on the work being

performed, three wind speeds prompt action: 20, 30 and 40 mph.

When wind speeds reach 20 mph or more, evaluate all outdoor elevated work including worker and material hoisting activities, work from ladders, boom or scissor lifts, and crane activities to determine whether they can safely proceed. If they cannot proceed safely, these activities should be suspended. Document and communicate this determination to all affected crews.

When wind speeds reach 30 mph or more, suspend all elevated work exposed to the wind. Care should also be taken while walking and carrying material to maintain balance and control of material. Provide goggles for all exposed ground workers to protect from flying particles. When wind speeds reach 40 mph or more, suspend all outdoor work. When these wind speeds prompting action are forecasted, ensure that material and equipment are secured ahead of time.

Water

If the work area is an established building, storm drains are designed to manage most water events. Water events that may impact the workplace include rain, snow, sleet, hail, flash floods and, in coastal workplaces, tidal waves.

As noted, construction projects may have an established a stormwater pollution prevention plan. If required, these plans should be documented and inspections should be performed throughout the project to ensure that the best management practices remain in place. Inspections are usually performed on a routine basis as well as after a qualifying event such as a rainstorm, flash flood or mudslide.

If an event overwhelms the best management practices or established storm drains, be sure to communicate the event and subsequent needs to corporate leaders and local authorities. This will allow them to best allocate needed resources. Remember that the focus when responding to incidents is to preserve life and health first, the environment second, and then to recover quickly.

Establish a snow and ice removal plan that protects workers as they access and egress their work. Be extra cautious of slippery conditions during these removal activities. Consider the use of strap-on boot cleats to increase traction on ice. When hail with a diameter greater than 0.5 in. occurs (roughly the size of a standard marble), all team members should seek shelter away from windows.

The National Weather Service identifies storms that produce hail with a diameter of a dime or larger as “severe thunderstorms.” Storms that are capable of depositing hail of that size are usually driven by winds that exceed 58 mph.

Lightning

Not all storms bring lightning, but lightning usually comes with a storm. If lightning is detected within 10 miles, elevated work should be suspended. This means that work with cranes, boom lifts, scaffolds, roofs and ladders should be limited to inside the building structure or stopped until both lightning strikes and thunder have not been detected within that radius for at least 30 min. If lightning is detected within 5 miles of a project, all outdoor activities should be suspended and workers should seek shelter until lightning strikes within that radius have not been detected for at least 30 min.

Thunder is the sound that lightning makes, so if you happen to miss the lightning but hear the thunder, seek shelter quickly. The National Weather Service has a helpful saying to remember this: “When thunder roars, go indoors.”

Forest Fires & Wildfires

With forest fires and wildfires, follow the recommendations of local authorities. Ensure that a system is in place to relay this information to all team members and trade partners. Basic weed control as well as proper implementation of a hot work permit process help to reduce the risk of sparking a forest fire or wildfire.

Earthquakes

Following an earthquake, buildings should be evacuated immediately and all employees accounted for. Before any work resumes, buildings should be inspected for safety. If there are any indications of structural damage, access to the building by any means should be prohibited and a structural engineer must evaluate and clear each building for access.

Recover: Never Compromise Safety

The sooner incidents of any magnitude are reported, the sooner corporate leadership teams and the community can allocate resources to assist with response and recovery. In extreme cases, community resources may include local church organizations, city, state or national governments, and even international support. Do not try to take it on all alone.

When injuries occur, it can take weeks and sometimes months to recover. When

natural disasters occur, recovery can take place in much less time with appropriate preplanning and response. Recovery ultimately means getting back to work, but for safety professionals that is not the only objective. Never compromise your safety or the safety of others, especially following a setback. During the recovery stage, there is often a temptation to cut corners or hurry to get the schedule back on track. Knowing this can help safety professionals to take a deep breath, stand firm and incorporate all the required safety protocols.

If natural disasters such as wind, flash floods or earthquakes have impacted a project, it is likely that the community was impacted as well. As safety professionals, we want to create remarkable experiences on both sides of the fence. Whenever possible, look beyond the project or workplace boundaries and find ways to make the community better, too. After all, it is when we are tested that our true character shines. **PSJ**

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