

Management Alert



Chill Out! Avoiding OSHA Heat Illness Liability

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Seyfarth Synopsis: Landmark Occupational Safety and Health Review Commission decision helps employers determine what steps need to be taken to protect employees from the hazards of heat at the workplace.

Introduction

Since 2012, the Occupational Safety and Health Administration (“OSHA”) has aggressively prosecuted employers based on injuries and illnesses due to heat illness. In doing so, OSHA has focused its efforts on employers in the construction industry, foundry operators, chemical producers, and employers in warm climates. Unfortunately, because OSHA does not have a heat illness standard, employers are left in the cold as to what they should do to mitigate risk and safeguard employees from excessive heat. This article discusses the issue of heat illness, OSHA’s guidance on heat illness, and how to prepare and protect employees from the hazard of heat.

A recent landmark decision by an Administrative Law Judge from the Occupational Safety and Health Review Commission in *Secretary of Labor v. Aldridge Electric Company*, Docket No. 13-2119, is a must-read for all employers who have potential employee heat exposure in their workplaces. After an eighteen day trial, the Judge issued a 54 page opinion vacating one OSHA General Duty Clause citation involving a national electrical contractor arising from a workplace accident.

What is “Heat”?

For OSHA purposes, the term “heat” is comprised of two main components: (1) environmental or ambient heat; and (2) metabolic heat.

Environmental or ambient heat is the heat that we all experience due to the natural environment. Factors impacting environmental or ambient heat include ambient temperature, wind, humidity, solar irradiance, and cloud coverage. Metabolic heat is heat generated internally within the human body. The harder a person works, the more metabolic heat is generated. An individual’s body mass, weight, age, sex, and medical history can all impact the amount of metabolic heat generated during any particular task.

What is Heat Illness?

Heat is not always a hazard. In fact we need heat to survive, particularly during Midwestern winters. Rather, heat becomes a hazard when it is “excessive” and the body is unable to dissipate heat quickly enough.

Heat illness is a complex illness, largely because of individual variability, as well as a number of external parameters that affect the individual and his or her response to the environment they are in. There are four main types of heat illness: (1) heat

rash; (2) heat cramps; (3) heat exhaustion; and (4) heat stroke. Heat syncope is also a form of heat illness, but is typically not considered life threatening.

Heat Rash

Heat rash, otherwise known as prickly heat, occurs when an individual sweats in areas of restrictive clothing. Its symptoms usually involve itchy and sometimes painful red bumps.

Heat Cramps

Heat cramps are muscle cramps usually caused by performing hard physical labor in a hot environment, and have been attributed to an electrolyte imbalance caused by sweating. Heat cramps often occur in the back and leg muscles. Treatment for heat cramps includes having an individual rest in a cool and/or shaded area and providing water and electrolytes.

Heat Exhaustion

Heat exhaustion is an illness that occurs when a body overheats, but the core body temperature does not rise above 101°F. The signs and symptoms of heat exhaustion are heavy sweating, headache, nausea, fatigue, vomiting, vertigo, weakness, thirst, and giddiness. Workers suffering from heat exhaustion should be removed from the hot environment and placed in a cool and shaded area, given fluid replacement, and encouraged to get adequate rest.

Heat Stroke

Heat stroke, the most severe form of heat illness, occurs when the body's temperature regulation system fails and body temperature rises to critical levels, above 101°F. Heat stroke is caused by a combination of highly variable factors, and its occurrence is difficult to predict. The primary signs and symptoms of heat stroke are confusion, irrational behavior, loss of consciousness, convulsions, a lack of sweating (usually), hot and/or dry skin, and an abnormally high body temperature. In effect, the body's cooling system, including sweating, has shut down and the employee's internal temperature rapidly rises, causing significant internal organ damage and, in many cases, death.

If an employee is suffering from heat stroke, OSHA recommends that:

The worker should be placed in a shady area and the outer clothing should be removed. The worker's skin should be wetted and air movement around the worker should be increased to improve evaporative cooling until professional methods of cooling are initiated and the seriousness of the condition can be assessed. Fluids should be replaced as soon as possible.

The differences between heat exhaustion and heat stroke can be difficult to diagnose, as even trained medical practitioners can misdiagnose heat stroke and heat exhaustion. The only accurate way to distinguish heat stroke from heat exhaustion is to measure an individual's core body temperature, which can be accurately measured only through esophageal probes or rectal thermometers; oral or ear thermometers are not considered accurate.

Unfortunately, heat stroke is never 100% preventable. In fact, exertional heat illness is among the leading causes of death in young athletes each year despite vigorous efforts to prevent it. Moreover, as the U.S. military shows, individuals will still experience and die from heat stroke no matter how physically fit they are and how many precautions are put in place.

In addition, susceptibility to heat illness is often dependent on individual characteristics, where many variables can come into account. Literature identifies individual heat illness "risk factors" such as: age, sex, pregnancy, physical fitness, race, disabilities, medication, and more.

Acclimatization

The process by which a body adapts to working in heat (or any condition) is known as "acclimatization." Acclimatization is a physiological process whereby the body adjusts to a change in its environment. Humans can become acclimatized to heat, and other environmental conditions, naturally by doing physical activities in their normal environment. To become acclimatized to heat, an individual must actually perform the work (s)he is expected to perform in the heat which they wish

to become acclimatized. For instance, if an individual digging a hole wishes to become acclimatized to 90°F, (s)he must actually dig holes in 90°F weather. Moreover, heat illness literature suggests that employees must perform work for at least two continuous hours to become acclimatized. In doing so, the individual will experience a degree of heat illness, resulting in an increased internal temperature of approximately two degrees.

There is no lab test to determine when someone is or is not acclimatized. Though there are some sophisticated options of performing core body temperature measurements or analyzing the amount of salt and water in sweat, those actions are not utilized by employers

How to Measure Heat

Environmental or Ambient Heat

Like any metric, there are numerous ways to measure heat. For purposes of measuring environmental or ambient heat, the potential measures are: dry bulb temperature, heat index, wet bulb temperature, the globe temperature, and the wet bulb globe temperature.

- The simplest method is the **“dry bulb” temperature (“DB”)**, which is the temperature measured by a standard, mercury-in-glass thermometer. The “heat index,” which is what OSHA relies upon in its guidance, is a calculation that takes into account the dry bulb temperature and the humidity to provide an indication of what the ambient conditions feel like. In short, the heat index gives a relative indication of how uncomfortable the air is outside.
- The **“wet bulb” temperature (“WB”)** is a mercury-in-glass thermometer that has a wetted wick over the thermometer’s bulb. The wick is wetted so that air flow across the wick will cause a cooling effect. The wet bulb temperature is akin to wetting one’s finger and placing it in the air to see how the wind cools the wetted finger. However, the greater the humidity, the less of a cooling effect air flow will have across the wet wick. For instance, if the humidity is 100%, the wetted wick will not cool like it would if the humidity was 60%.
- The **“globe” temperature (“GT”)** is the temperature measured with a globe thermometer, which is a mercury-in-glass thermometer that is inserted inside a black colored copper sphere. The globe temperature mimics the effects of sources of radiant heat, such as the sun, furnaces, and boilers. Essentially, the globe temperature shows what it would be like in a closed vehicle when the sun is out. Equipment stabilization of approximately 20-30 minutes is required to accurately obtain the globe temperature.
- The **wet bulb globe temperature (“WBGT”)** measures a combination of the dry bulb, the wet bulb, and the globe temperature. For indoor and outdoor conditions with no solar load (irradiance), the WBGT is calculated as $0.7 \text{ WB} + 0.3 \text{ GT}$. However, for outdoor conditions with a solar load, the WBGT is calculated as $0.7 \text{ WB} + 0.2 \text{ GT} + 0.1 \text{ DB}$. Thus, solar load or irradiance has a smaller effect on the WBGT in outdoor areas with a solar load than it does on indoor areas or outdoor areas with no solar load.

A WBGT device must be properly stabilized before it can be used, and typically has to remain positioned in a single location for at least 15-20 minutes. Moreover, though handheld WBGT devices have recently been developed for commercial use, the issue still remains that WBGT readings are akin to a foreign language because they are so significantly different from commonplace dry bulb and heat index measurements. Thus, though an employee may be able to operate a handheld WBGT device, it requires extensive and skilled training to ensure the employee knows how to interpret the WBGT data and take appropriate actions.

The WBGT is more appropriate for fixed locations, such as manufacturing facilities, where employees are exposed to the same environmental conditions throughout the day. This is known as a “fixed” or “static” environment. On the other hand, WBGT devices are typically inappropriate in outdoor construction settings, where the worksite is moving and has regularly changing weather conditions. This is known as a “dynamic” environment. WBGT monitoring in dynamic outdoor settings provides a lagging, reactive indicator as opposed to a proactive indicator. In other words, an employer must always react to what happened during the last 15-30 minutes and cannot be proactive in its actions.

Metabolic Heat

Unlike measuring ambient heat, metabolic heat is much more difficult and/or invasive to determine. As mentioned above, metabolic heat can be accurately measured only through esophageal probes or rectal thermometers. Oral or ear thermometers are not accurate. Thus, determining an employee's true core temperature is near impossible at a worksite.

Scientists, however, have developed several methods to estimate an individual's metabolic heat, as measured in Watts, kilo-cals, or METs. This process is incredibly complex and requires specialized training and experience. In short, to determine an individual's Watts, kilo-cals, or METs, an employer must evaluate the individual's job duties into specific tasks, assign a value to each individual task, prepare a weighted average based on the time spent on each task, determine a total amount of Watts, kilo-cals, or METs, and multiple that amount based on the individual's weight, physical condition, sex, or pregnancy. An analysis would need to be done for each employee at the worksite. This is an incredibly burdensome and complicated process that has been done almost exclusively in the academic area.

Anatomy of a Heat Illness Program

OSHA Has No Heat Illness Standard

Because Federal OSHA does not have a heat illness standard, it relies on the General Duty Clause, Section 5(a)(1), to cite employers in cases related to heat illness. To prove a Section 5(a)(1) violation, OSHA must establish by a preponderance of the evidence: (1) a condition or activity in the workplace created a hazard; (2) the employer or its industry recognized the hazard; (3) the hazard was likely to cause death or serious physical harm; and (4) feasible means existed to eliminate or materially reduce the hazard. To present its case, the OSHA must define the hazard so that an employer is apprised of: (1) its obligations; and (2) the conditions or practices it can reasonably be expected to exercise control. As such, a hazard under Section 5(a)(1) cannot be established based on a "freakish or unforeseeable death."

State Heat Illness Programs

Currently, only two OSHA state-plan states have heat illness standards: California and Washington. Both California's and Washington's standards are based solely on the dry bulb temperatures in Fahrenheit.

California

California enacted its "Heat Illness Prevention" standard, Cal. Code Regs. tit. 8, § 3395, in 2005. California's standard requires employers to take the following specific actions.

- California requires that when the temperature exceeds 85°F, the employer must have and maintain one or more areas with shade at all times while employees are present that are either open to the air or provided with ventilation or cooling. The amount of shade shall be enough to accommodate 25% of the employee on the shift at any time so they can sit in a normal posture without having to be in physical contact with one another. The shaded area must be located as close as practicable to the areas where employees are working. Moreover, even when the temperature does not exceed 85°F, an employer must provide shade upon an employee's request, and employees must be allowed and encouraged to take a cool-down rest in the shade for a period of no less than five minutes at a time when they feel the need to do so to protect themselves from overheating.
- In "High-Heat" situations where the temperature equals or exceeds 95°F DB, Cal-OSHA requires employers to do the following "to the extent practicable":
 - Ensure that effective communication by voice, observation, or electronic means is maintained so that employees at the work site can contact a supervisor when necessary;
 - Observe employees for alertness and signs or symptoms of heat illness;
 - Remind employees throughout the work shift to drink plenty of water; and
 - Provide close supervision of a new employee by a supervisor or designee for the first 14 days of the employee's employment by the employer, unless the employee indicates at the time of hire that he or she has been doing similar outdoor work for at least 10 of the past 30 days for 4 or more hours per day.

- Finally, Cal-OSHA’s regulation requires employers to provide employees and supervisors training on hazards of heat illness.

Washington

Enacted in 2008, Washington’s “Outdoor Heat Exposure” standard, Wash. Admin. Code 296-62-095, applies to outdoor worksites when the temperature is at or exceeds 89°F and employees are not required to wear non-breathing clothes or double-layer woven clothing. Under Washington’s standard, when the temperature is at or exceeds 89°F, employers must:

- Address their outdoor heat exposure safety program in their written accident prevention program;
- Encourage employees to frequently consume water or other acceptable beverages to ensure hydration;
- Ensure that a sufficient quantity of drinking water is readily accessible to employees at all times;
- Ensure that all employees have the opportunity to drink at least one quart of water per hour;
- Relieve employees showing signs or demonstrating symptoms of heat-related illness from duty and provide them with a sufficient means to reduce body temperature;
- Monitor employees showing signs or demonstrating symptoms of heat-related illness to determine whether medical attention is necessary; and
- Provide employees and supervisors training on heat illness prevention.

Federal OSHA’s Guidance On Heat Illness

In 2012, OSHA implemented its Campaign to Prevent Heat Illness in Outdoor Workers, through its “Water. Rest. Shade.” program. Based upon Cal-OSHA’s materials, OSHA’s “Water.Rest.Shade.” program focuses on the heat index to advise employers on suggested precautions. As part of the program, OSHA has provided employers an “All-in-One” publication titled “Using the Heat Index: A Guide for Employers,” (“Heat Index Guide”) informing employers on how to use the heat index to determine “when extra precautions are needed at a worksite to protect workers from environmental contributions to heat related illness.” OSHA published the Heat Index Guide to:

[Help] employers and worksite supervisors prepare and implement hot weather plans. It explains how to use the heat index to determine when extra precautions are needed at a worksite to protect workers from environmental contributions to heat-related illness.

The Heat Index Guide, however, is “advisory in nature and informational in content,” and, as such, “is not a standard or regulation, and it neither creates new legal obligations nor alters existing obligations created by OSHA standards or the Occupational Safety and Health Act.”

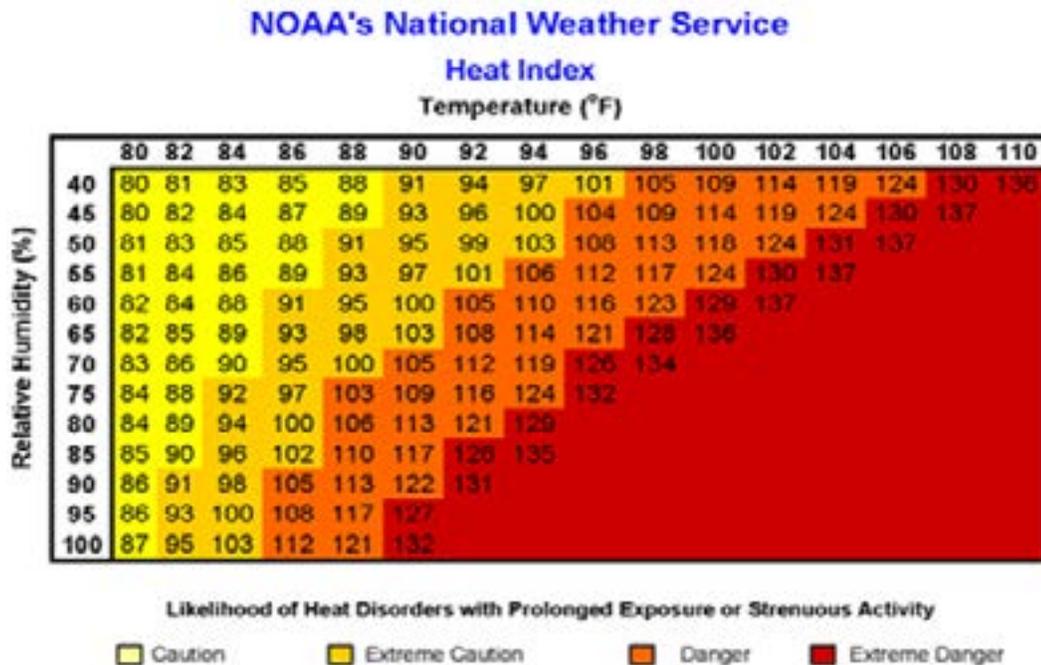
The Heat Index Guide’s Four Risk Levels.

Even though the heat index typically does not register until the ambient temperature has reached 80°F, OSHA’s Heat Index Guide is based on four different levels:

Heat Index	Risk Level	Precautions
Less than 91° F	Lower (Caution)	Basic heat safety and planning
91° to 103° F	Moderate	Implement precautions and heighten awareness
103° to 115° F	High	Additional precautions to protect workers
Greater than 115° F	Very High to Extreme	Triggers even more aggressively protective measures

In the Heat Index Guide, OSHA states that “workers are at risk of heat-related illness when the heat index is high.” (emphasis added). OSHA identifies the heat index to be at “High” risk when the heat index is 103-115°F.

In evaluating the heat index, OSHA recommends that employers use the National Oceanic and Atmospheric Administration (“NOAA”) heat index chart, below, taking the relative temperature and humidity levels to determine where it falls on the chart. Consequently, if the heat index falls in the caution level, employers are directed to adhere to the precautions contained in the “Caution” range as provided by OSHA.



In addition to the heat index, the Heat Index Guide states that “heat index values were designed for shady, light wind conditions, and exposure to full sunshine can increase heat index values by up to 15° Fahrenheit.” Though the Heat Index Guide states that full sunshine can increase the heat index values, OSHA has not provided any scientific basis for such a conclusion. Moreover, OSHA does not provide any definition as to what “direct” or “full sunshine” means, how employers should add “up to 15° Fahrenheit” based on the sunshine, or when it should be applied. OSHA also does not provide any definition for “shady” or “light wind conditions.”

What does OSHA Want Employers to Do?

OSHA’s Heat Index Guide provides what would seem to be relatively straightforward directions as to what employers should do at any particular heat index. Unfortunately, that is far from the case, as OSHA has shown a tendency to claim that suggested protections at higher temperatures should be used at lower temperatures based on vague and undefined conditions of “strenuous work,” “full sunshine,” and “light wind.” Despite OSHA’s inconsistency on these issues, the Heat Index Guide provides the following suggestions for employers:

- Develop a heat illness prevention program;
- Provide employees training on the heat illness prevention program, including how to recognize, prevent, and treat heat illness;
- Develop a system to monitor weather conditions on, at least, a daily basis, and, preferably, multiple times per day;
- Provide water, shaded areas, and cooling stations for employees;
- Develop an emergency response plan in the event an employee suffers from heat illness;
- Actively supervise employees to evaluate for signs and symptoms of heat illness; and
- Perform physiological monitoring.

What Is OSHA's Interpretation of Acclimatization?

Acclimatization is the process by which individuals physiologically adjust to warmer or colder temperatures. For instance, you may notice that when you travel to a warm location for a vacation, you tend to sweat more at the beginning of the vacation than you do at the end of the vacation. The Heat Index Guide states that, under certain temperature conditions, new workers, or workers returning from time away from work, should be acclimatized to the level of work. In other words, new or returning employees should be brought along at a gradual pace before they are permitted to work at a normal rate.

Unfortunately, what is considered a "gradual pace" remains unclear. The Heat Index Guide suggests that a gradual pace would be 50% work per hour for the first day, 60% the second day, and so on until you reach 100%. However, some of OSHA's compliance officers and experts have asserted that acclimatization should begin at 20% work per hour (or 12 minutes per hour) and gradually increase from there. It has yet to be determined which rate is accurate.

Another issue that remains unclear is at what temperature employers should implement an acclimatization program. Under OSHA's former Heat Index Guide, acclimatization was not recommended until the heat index reached 91°F. Under the current Heat Index Guide, OSHA inconsistently states that acclimatization may be required even if the heat index is below 91°F. In fact, some OSHA compliance officers and experts have asserted that acclimatization should occur no matter what the ambient temperature is.

Yet another issue for employers is the situation where employees return to work from an extended absence, whether due to injury, the holidays, or vacation. Again, OSHA's Heat Index Guide differs from the opinions of some of OSHA's compliance officers and experts. Specifically, the Heat Index Guide states that acclimatization may be necessary if an existing employee is returning from an absence of two weeks or more. On the other hand, some of OSHA's compliance officers and experts have asserted acclimatization should occur if an employee has been gone for **three or more** days. In other words, any time an employee has an extended weekend, (s)he would need to be re-acclimatized.

What Are Regimented Work/Rest Regimens?

Similar to, but distinct from, acclimatization is a structured work/rest regimen, a defined process requiring employees to rest a certain amount of time per hour. For instance, depending on the conditions, an employer should establish work/rest regimens where an employee works 45, 30, or 15 minutes per hour, and then takes a break for 15, 30, or 45 minutes per hour.

Although it may seem like telling employees to take a break during a hot day, whenever they experience a need to temporarily rest would be sufficient, OSHA has taken the stance that employers need to take affirmative action to ensure that employees take *mandatory* breaks. This involves requiring employees to sign sheets identifying when their breaks start and stop, supervisors actively monitoring the sheets to ensure the appropriate amount of breaks of sufficient duration are taken, and disciplining employees who fail to take the required amount of break.

How Can Active Supervision Occur?

The Heat Index Guide does not specifically indicate how employers should actively supervise their employees. Nonetheless, it is advisable for employers to implement a "buddy system," where employees are not left alone, a co-worker(s) can identify if someone is suffering from heat illness and bring it to the attention of a supervisor. Also, employers have used, with great success, programs to identify new employees, such as colored hard hats, colored vests, and other markers to easily identify employees who may need closer observation.

What is Physiological Monitoring?

The Heat Index Guide recommends that employers perform physiological monitoring of employees at "hot worksites." Specifically, the Heat Index Guide recommends employers conduct heat exposure history evaluations, monitor employee heart rates, perform oral temperature readings, conduct body weight and body water loss measurements, perform blood pressure readings, and perform respiratory rate analyses. In other words, OSHA has asked employers to medically evaluate employees to determine which employees have "risk factors" that may make them more susceptible to heat illness.

However, physiological monitoring is permitted in only limited circumstances under the Americans with Disabilities Act Amendments, and is permitted only when the employer has objective, current evidence that an employee is a direct threat to him or herself or others, in this case, because of the observable effect of heat exposure. Moreover, singling out employees

based on their weight, age, sex, race, medical conditions, or pregnancy, all “risk factors” for heat illness, exposes employers to claims of discrimination.

Conclusion

Because OSHA has decided to rely on the General Duty Clause to enforce cases related to heat illness, there is no answer for all circumstances as to what employers should do to ensure they remain fully compliant. In fact, as the recent *Aldridge Electric Co.* OSHA Review Commission decision shows, no matter how thorough an employer’s heat illness prevention program is, OSHA will still issue a citation, even if an unavoidable incident occurs.

To prepare for the upcoming summer, it is advisable for employers to:

- Develop a heat illness prevention program;
- Provide employees training on the heat illness prevention program, including how to recognize, prevent, and treat heat illness;
- Develop a system to monitor weather conditions on, at least, a daily basis, and, preferably, multiple times per day;
- Provide water, shaded areas, and cooling stations for employees;
- Develop an emergency response plan in the event an employee suffers from heat illness;
- Acclimatize new and returning workers;
- Develop regimented work/rest regimens for when the heat index is high; and
- Actively supervise employees to evaluate for signs and symptoms of heat illness.

Employers must take proactive steps in the face of OSHA’s use of the General Duty Clause for heat-related illness enforcement. Taking such steps now may allow the employer to avoid costly enforcement and litigation in the future.

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