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Top Stories

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Reminder to Protect Workers from the Dangers of Cold Stress

By Savita Trivedi, Occupational Hygienist

As the cold weather is upon us, it is important to be reminded of the serious and sometimes fatal/permanent effects of cold stress as well as the necessary precautions to protect employees. Working outdoors in cold environments, especially for extended periods of time, can put workers at risk of serious cold induced injuries and illnesses. This risk can increase with wind velocity, causing heat to leave the body more rapidly and making cold air feel even colder. Construction workers, lumber workers, sanitation workers, snow cleanup crew, police officers, and firefighters are amongst some of the workers who may be at risk of cold stress from working outdoors in cold environments. Cold stress can also affect those who work in cold indoor environments such as cold storage facilities and meat-packing houses as well as those who work with cold liquefied gases such as nitrogen.

In a cold environment, the body must work harder to conserve heat and maintain its internal core temperature. Initially, the skin and extremities may be affected. As exposure to cold continues, the body's internal core temperature may begin to drop. When this occurs, serious debilitating and life-threatening conditions may occur. Examples of cold stress conditions are as follows:

Hypothermia

Hypothermia occurs when the normal body temperature of 98.6°F drops to 95°F or below. It occurs in a cold environment when the body loses heat faster than it can be produced. Although it is likely to occur in very cold temperatures, cases of hypothermia may occur in cool temperatures (above 40°F) when combined with factors such as wind, rain, sweat, or immersion in cold water. In 2019, about 1300 people in the U.S. died of hypothermia; approximately 32% were occupationally related [NIOSH].

An initial symptom of hypothermia is uncontrollable shivering. It is a warning sign of the body losing heat and trying to generate heat and warm itself. Initially, an exposed person will be alert. However, as the body temperature continues to drop, symptoms worsen, and the exposed person may have reduced mental alertness. Lack of coordination, confusion, disorientation, irregular breathing, and slow slurred speech may occur. Eventually it can lead to a loss of consciousness or even death.

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What to do when a worker suffers from hypothermia?
Call 911 immediately as this is a medical emergency. Move the person to a warm, dry area. Remove any wet clothing and replace with dry clothes. Cover the body, including the head and neck, with blankets. Using a vapor barrier such as a tarp can help block the cold. If medical help is more than 30 minutes away and worker is conscious, give warm, sweetened drinks (sports type drinks). Apply heat packs to the armpits, sides of chest, and groin. Follow additional instructions per the emergency medical services.

Frostbite

Frostbite is an injury to the body that is caused by freezing of the skin and underlying tissues from exposure to very low temperatures. It typically affects the extremities such as the fingers, toes, nose, and ears. It can cause permanent damage to body tissues, and in severe cases lead to amputation. Those who previously suffered from frostbite and those with poor circulation are more susceptible to frostbite.

Symptoms of frostbite include tingling, stinging, aching, and numbness in the affected body part such fingers or toes. Reddened skin may develop white, grayish-white or bluish-white patches. The affected area feels firm or hard to the touch and may have a waxy appearance. Blistering of the skin may also occur.

What to do when a worker suffers from frostbite?
Follow the recommendations noted above for hypothermia. Protect the frostbitten area by wrapping it loosely in a dry cloth. Do not rub the affected area as this could cause damage to the skin and underlying tissue. Do not try to apply water to affected area or break blisters.

Trench Foot

Trench foot, also known as immersion foot, is an injury to the feet caused by prolonged exposure to damp, wet and cold conditions. Trench foot can occur even at air temperature as high as 60°F if feet are constantly wet. Wet feet lose heat 25-times faster than dry feet [CDC/NIOSH]. In the case of trench foot, blood vessels constrict, circulation in the feet shuts down, and the skin tissue begins to die.

Trench foot is characterized by reddening of the skin, numbness, and swelling. Tingling pain, blisters and/or ulcers may also occur.

First aid measures include removing wet shoes/ socks, air drying feet in a warm area, and keeping feet elevated.

Other cold related conditions

Other cold related conditions include, but are not limited to, dehydration, sunburn, snow blindness, chilblains, and burns from contact with cold metal surfaces.

Windchill Factor

The ambient air temperature is not the only factor that affects the risk of cold stress when working outdoors. The wind speed is also a factor. The wind chill temperature is the temperature the body feels when air temperature and wind speed are both taken into account. It provides an estimate of the cooling power of the environment. For example, when the air temperature is 40°F, and the wind speed is 35 mph, the effect on the exposed skin is as if the air temperature was 28°F. The wind chill temperature can be calculated using a tool from the National Weather Service and can be used to determine clothing requirements. It can also be used to determine allowable work times as well as when to suspend outdoor work.

Risk Factors that Contribute to Cold Stress:

- Prolonged exposure to cold environments
- Exposure or contact to wetness/dampness (increases heat loss from the body much faster).
- Immersion into water
- Wearing inadequate clothing
- Exhaustion from physical activity (makes a person more susceptible to heat loss).
- Predisposing health conditions such as hypertension, hypothyroidism, and diabetes
- Poor physical conditioning
- Drug/alcohol use

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Although OSHA does not have a specific standard that covers working in cold environments, pursuant to *Section 5(a)(1) of the Occupational Safety and Health Act of 1970*, employers have a responsibility to provide their employees with a workplace free from recognized hazards which are causing or are likely to cause death or serious physical harm to them. This includes protecting employees from the hazard of cold stress.

What Can Employers Do to Prevent the Hazard of Cold Stress?

Conduct a risk assessment. Identify workplace or environmental conditions which could pose a risk for cold-induced injuries or illnesses to workers.

Training. Train workers on measures to prevent cold stress as well as how to recognize the signs and symptoms of serious cold induced injuries and illnesses. Include the importance of self-monitoring and monitoring of coworkers for symptoms.

Provide engineering controls. Examples include the use of radiant heaters to warm workplaces like outdoor security stations or shelters used for breaks, covering metal handles of tools with thermal insulating material, and providing shields to protect work areas from wind or drafts.

Implement safe work practices.

- Avoid or limit exposures to extremely cold temperatures when possible.
- Provide workers with warm dry shelters (tents, cabins, etc.) for taking breaks.
- For outdoor work, establish a work/rest schedule based on air temperature & wind speed.
- In case of heavy shivering or excessive fatigue, instruct workers to immediately return to shelter.
- Schedule outdoor work, particularly heavy work, for the warmest part of the day when possible.
- Use the buddy system. Assign workers to work in pairs and monitor each other for symptoms.
- Provide warm sweetened liquids (sports type drinks) to workers to replace body moisture loss.
- Encourage employees to stay hydrated and avoid caffeinated drinks such as coffee or tea.
- Acclimatize new workers by gradually increasing their workload, and requiring more frequent breaks in warm areas, as they build up a tolerance for working in the cold environment.
- Monitor workers' physical condition, especially those who are at risk of cold stress.
- Monitor weather conditions and modify/suspend work as necessary.

Dressing appropriately for the cold.
The following are recommended for working in cold environments [OSHA]:

- At least three layers of loose-fitting clothing. Layering provides better insulation.
  - -An inner layer of wool, silk or synthetic fabric that wicks moisture away from the body.
  - -A middle layer of wool or synthetic fabric to provide insulation, even when wet.
  - -An outer wind and rain protection layer that allow ventilation.
- A hat or hood. Hats reduce the amount of body heat that escapes from the head.
- A knit mask to cover the face and mouth, if needed.
- Insulated gloves to protect the hands, water resistant if needed.
- Insulated and waterproof boots (or other footwear) to protect against cold & dampness.

With respect to clothing, it should be noted that a single standard will not apply to all workers. Also, workers could adjust their clothing as needed; layers can be removed or added to prevent overheating and sweating or being chilled. It is important that workers stay dry in the cold as moisture/dampness (e.g., from sweating) can increase the rate of heat loss from the body. An additional set of dry clothing should be kept on hand.

Requesting a Consultation

To learn more or request your free consultation from CONN-OSHA:

Call us at 860-263-6900, or visit our webpage

References:

OSHA Cold Stress Topic. Washington, DC: U.S Department of Labor, Occupational Safety and Health Administration, https://www.osha.gov

ACGIH [2021]. TLVs® and BEIs® Based on the Documentation of the Threshold Limit Values for Chemical Substances and Physical Agents & Biological Exposure Indices. Cincinnati, OH: American Conference of Governmental Industrial Hygienists.

NIOSH [2019]. Preventing cold-related illness, injury, and death among workers. Cincinnati, OH: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Institute for Occupational Safety and Health. DHHS (NIOSH)

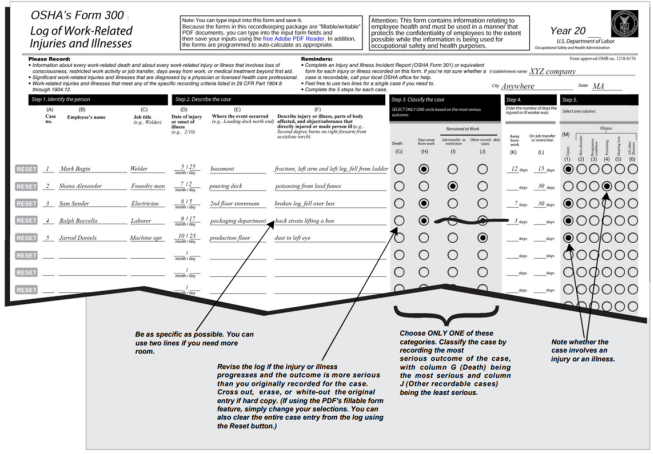
OSHA's Recordkeeping Requirements

By Catherine Zinsser, Occupational Safety Training Specialist

29 CFR 1904 requires employers to keep records of occupational deaths, injuries, and illnesses. This data can be used in several ways. OSHA uses the data to help direct its programs and measure its own performance. OSHA Inspectors use the data during inspections to help direct their efforts to the hazards that may result in injuries and illnesses. Analysis of the national data is a recognized method for discovering industry specific workplace safety and health problems and for tracking progress in solving those problems. Employers can use their data to troubleshoot and identify safety and health concerns at their workplace.

Basically, 1904 consists of three forms that the employer needs to complete. The best known of the three is the OSHA 300 log which is a record of work -related injuries and illnesses. The Log details the extent and severity of each case. The OSHA 300A is a summary of the data recorded on the 300 log and is the form which must be physically posted where your employees have access to it. The posting period is February 1 through April 30 of each year. The OSHA 300A data is also electronically submitted to OSHA by March 2 each year if your operation meets the submission requirements. The last of the three is the first form you will be filling out; the OSHA 301 Injury and Illness Incident Report otherwise known as the first report of injury and illness. This form records details of recordable work-related injury or illnesses and many employers use their insurance carrier's version which is allowed.

Not every employer is subject to the requirements of 1904. There are several exemptions to the rule. An employer in any industry who employed no more than 10 employees at any time during the preceding calendar year is not required to maintain OSHA records of occupational illnesses and injuries during the current year unless requested to do so in writing by the Bureau of Labor Statistics. Another exemption applies to businesses that are sole proprietorships or partnerships, the owners and partners would not be considered employees and would not be counted. Another exemption applies to family farms if the family members are not counted as employees. Businesses in certain low-hazard industries are another exemption. 1904 exemptions are not absolute, and employers should use due diligence and confirm that an exemption applies to their operation before it is taken. There is another potential exemption for States operating OSHA-approved State plans; again, due diligence should be applied. In Connecticut, there are no reporting exemptions for public sector employers.



When an injury or illness occurs, the process of deciding if the "event" goes on the Log begins and can be confusing. Your answers to detailed questions will help with your decision. Questions may include: "Was medical treatment or first-aid required?"; "Was a prescription written and given to the employee?" and "Is the injured person an employee or temporary staff?"

There are many helpful resources that employers can tap into. One is the Federal OSHA recordkeeping webpage. Another is your insurance carrier. Additionally, CONN-OSHA has a section on our website dedicated to recordkeeping. Finally, CONN-OSHA's Consultation Services is another valuable resource available to Connecticut employers.

Questions may also be directed to CONN-OSHA's Training Specialists. When calling the office at 860-263-6900, ask to speak with one of the Trainers. Take note that the Trainers typically offer a training session on Recordkeeping quarterly. The next session is scheduled for May 9, 2023. To register for this training and view other trainings being offered, see our training calendar on the next page or visit our website.

How to Subscribe

Contact robert.hunt@ct.gov and in the subject line type "Subscribe" and then provide your e-mail address in the body of the message.

Save the DATE

Training Schedule

***Virtual* Safe/Defensive Driving - Is there a difference?** *2/7/23*	Work-related vehicle crashes are the leading cause of occupational fatalities according to the U.S. Dept. of Labor. Small changes in behavior behind the wheel can decrease the likelihood of getting in a motor vehicle accident, and increase your chances of survival in the event of a collision or other serious event. The goal of this session is to increase awareness of the need for, and the benefits of safe driving.
***Virtual* Intro to OSHA** *2/17/23*	What is OSHA? Why are they here? What will they ask for? What gives them the right to…? These are questions that are often asked and during this session these questions will be answered. We will also address the topic of "Hazard Recognition" and what that should mean to you and the people that are close to your hearts which is the real reason to "work safe". During this session the following questions will be discussed: • What is OSHA? • What is CONN-OSHA? • What happens during an OSHA inspection? • What were the 10 most frequent citations issued last year and what did they cost? • What is hazard recognition and what does it mean to me?
***Virtual* Stairway and Ladder Safety** *3/13/23*	An overview of stairway and ladder safety will be discussed during this course. Falls from stairways and ladders result in thousands of injuries per year. Basic types of ladders and stairways, hazards and methods to prevent those hazards, and the OSHA requirements will be covered.
OSHA 10-Hour Construction *3/29/23 - 3/30/23*	The Minority Construction Council and the OSHA Training Alliance is hosting an OSHA-10 Hour Construction training for contractors, their employees and local residents who are interested in obtaining and renewing their certification. This class will be held from 10:00 am to 3:30 pm each day at the American Job Center, 2 Lafayette Square, Bridgeport, CT 06604. Participants are required to attend BOTH sessions to receive their OSHA card and the class is limited to 30 participants. The cost is $20. Visit mccforct.org to register.
***Virtual* Chat with a CONN-OSHA Compliance Officer: Trenching and Excavation** *4/4/23*	During this session you will have the opportunity to hear from a CONN-OSHA Compliance Officer. The focus topic will be on Trenching and Excavation. Studies show that excavation is one of the most hazardous types of work done in the construction industry. An overview of 29 CFR 1926.650 - 652, Excavations, including the role of the competent person, will be discussed. Feel free to bring questions for the Compliance Officer!
***Virtual* Work Zone Safety** *4/17/23*	Basic guidelines for work zone traffic control and the requirements of Part VI of the Manual on Uniform Traffic Control Devices (MUTCD) with particular emphasis on short term work sites on roads and streets in rural and small urban areas will be presented.
OSHA 10-Hour Construction *4/26/23 - 4/27/23*	The Minority Construction Council and the OSHA Training Alliance is hosting an OSHA-10 Hour Construction training for contractors, their employees and local residents who are interested in obtaining and renewing their certification. This class will be held from 8:30 am to 2:30 pm each day at New Park Office & Conf. Center, 151 New Park Avenue, Hartford, CT 06106. Participants are required to attend BOTH sessions to receive their OSHA card and the class is limited to 30 participants. The cost is $20. Visit mccforct.org to register.
***Virtual* Chat with a CONN-OSHA Consultant: Fall Protection** *5/4/23*	During this session you will have the opportunity to hear from a CONN-OSHA Consultant. The focus topic will be on Fall Protection. Falls are among the most common causes of serious work-related injuries and deaths. OSHA requirements for the various fall protection options will be covered. The special requirements for scaffolding and residential construction will also be touched upon. Feel free to bring questions for the Consultant!
***Virtual* OSHA 300 Recordkeeping - What Does and Does Not Need to be Recorded** *5/9/23*	The purpose of this workshop is to introduce the requirements and procedures related to OSHA Injury & Illness Recordkeeping, including the electronic reporting of injuries and illnesses requirements. The class will help develop skills to accurately report occupational injuries and illnesses. Resources and reference materials will be provided. If you are responsible for completing the documents required by this rule (OSHA 300, OSHA 300A and OSHA 301), or if you supervise the person that completes the forms, or if you are a safety committee member, this class is a must!
New England Roundtable *Every Wednesday of the Month*	Bringing business together to network and share ideas in the occupational safety and health community. The roundtable meetings are held from 9:00 am to 10:15 am every Wednesday.

Visit this link for more info and to sign up.

Hazard Corner: Fatalities and catastrophes involving cold temperatures.

Publicly available investigation summaries from OSHA inspections are summarized below:

Case 1

An employee of a fruit packing company went into the cold storage room at the end of the day. The employee was found dead in the cold room at 8:00 a.m. on April 1, 2022. The cold room was sealed on March 24, 2022.

Case 2

At 2:00 a.m. on January 1, 2015, an employee of a logging company was found dead near his 4-wheeler after a missing report was filed. The cause of death was exposure to the elements (Hypothermia).

Case 3

At approximately 10:00 a.m. on February 19, 2008, an employee was operating a skidder truck for a logging company. He was driving the truck across a bridge covered with ice, when the back tires of the skidder struck a piece of wood that was elevated above the surface. The skidder slid and fell backwards into an ice-cold stream. With the skidder submerged in the water, the operator broke through the door and swam to the surface. He had to break through the ice before he could be pulled from the water. He sustained hypothermia. The logging company hired a construction company to remove the skidder from the water and intended to use an excavator to remove the skidder. The operator of the excavator encountered the same problem as the operator of the skidder. His machine slid off the bridge, landing on the skidder. The operator of the excavator sustained no injuries. There were two separate but related accidents on this bridge on this day.

Case 4

On October 21, 2008, an employee of a cold storage company was sweeping a cold storage warehouse. He was sweeping the floor with a push broom and began to have symptoms of a heart attack. The employee left work to go home. An ambulance took him from his home to the hospital and he died enroute to the hospital.

Fatality & Casualty Reporting

State & Town:

- **Report to CONN-OSHA**
- **(860) 263-6946**
- **(866) 241-4060 *Toll Free***

Private Employers:

- **Report to Federal OSHA**
- **(800) 321-OSHA (6742)**

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