ESSENTIAL 29: Cold Stress



Key Takeaways:
– Knowing the hazards of working in cold environments including physical signs, symptoms, and treatments.
– Recalling ways to protect against cold stresses, including observing environmental protections, undertaking other preparations and practices, and dressing appropriately.

Course Description
Cold stress is hazardous in emergency response situations like natural disasters. People in this line of work may have to work in cold environments for extended periods. Below there are frequently asked questions to make employees facing a hazardous situation aware of what cold stress is, how affects health and safety, and how it can be prevented.

How cold is too cold? If the body cannot warm itself, then cold-related stress may result. There is a possibility of tissue damage and death. Four contributing factors: – Cold temperatures – Strong and fast wind – Damp air – Contact with cold water and/or surfaces Wind chill is the consideration of air temperature with wind speed. An example of this is when the air temperature is 40°F, but the wind speed is 35 mph, exposed skin experiences conditions equivalent to the air temperature being 11° F. Although it is obvious that freezing conditions and inadequate clothing can cause cold stress, it is important to understand that cold stress can also come from temperatures in the 50’s coupled with some rain and wind. How do cold conditions affect the body? Cold environments force the body to work harder at maintaining its core temperature. While in cold environments, majority of the body’s energy is used to keep your internal temperature warm because the cold air, water, and snow draw away heat. Eventually your body shifts blood flow from the hands, feet, arms, legs, and outer skin to the core (the organs within the chest and abdomen). This makes everything besides the core to cool rapidly. Older workers often are at more risk than younger ones, since older bodies do not generate heat as quickly. As well, medications like anti-depressants, sedatives and tranquilizers can prevent the body from generating heat normally. What are the most common cold induced problems? Hypothermia Hypothermia happens when body heat disappears faster than it can be replaced. If the core body temperature drops below the normal 98.6° F to 95° F range, workers will experience an onset of symptoms: – You may shiver and need to stomp your feet to generate heat. – You may lose coordination, have slurred speech, and fumble items in your hand. – Skin turns pale and cold. –

While the body temperature keeps falling, these symptoms will worsen and shivering will stop. – You may not be able to walk and stand. When body temperature falls to around 85° F severe hypothermia develops and the person may become unconscious; at 78° the person could die. Mild Hypothermia Treatment – Move to somewhere warm and stay active. – Remove all wet clothing and replace them with dry clothes or blankets, in addition to covering the head. – Drink a warm, but not hot, sugary drink to increase metabolism and raise internal core temperature – Avoid caffeinated drinks. Severe Hypothermia Treatment – Do all of the mild hypothermia treatments. – Call 911 for emergency personnel – Cover all everything completely and place very warm objects, such as hot packs or water bottles, on the victim's head, neck, chest and groin. Warm the arms and legs last. – Do not apply external heat to re-warm and treat the worker very gently. – Hospital treatment is necessary. – When a worker is in water and unable to exit, secure collars, belts, hoods, etc. to maintain warmer water contact against the body. Move the limbs as close to the torso as possible to conserve body heat. Frostbite Frostbite happens when the skin actually freezes and loses water. During severe cases, amputation of the frostbitten area might be necessary. Although frostbite typically happens when the temperatures are 30° F or lower, wind chill factors can cause frostbite to occur in above freezing temperatures. Frostbite usually affects the extremities, particularly the feet and hands. Frostbite Symptoms – Affected body part becomes cold, tingles, stings or aches before numbing. – Skin color goes from red to purple then white, and is cold when touched. – Blisters appear in severe cases. Frostbite Treatment – Do not rub the area to warm it. – Wrap the area in a soft cloth, move the worker to a warm area, and contact medical personnel. – Do not leave the worker alone. – Do not pour water on the affected body part. If there is a chance that the affected part will get cold again do not warm. Warming and re-cooling will cause severe tissue damage. Trench Foot Trench foot or immersion foot happens when feet are immersed in cold water at temperatures above freezing for long periods of time. Similar to frostbite, but trench foot is considered less severe. Symptoms include: – Tingling, itching or burning sensation – Blisters may be present Trench Foot Treatment – Soak feet in warm water and wrap with dry cloth bandages. – Drink a warm, sugary drink. What preventive measures can be taken? Employers and employees must plan ahead when working in cold conditions. Remember the following recommendations when working in cold environments: The best way to avoid cold stress is protective clothing. Fabric type also makes a difference, so keep the following recommendations in mind: – Wear a minimum of three layers. Use an inner layer of wool, silk or synthetic to keep moisture away from the body, a middle layer of wool or synthetic to provide insulation, and an outer wind and rain protection layer that allows some ventilation. – Wear a hat or hood to prevent the up to 40% of body heat that can be lost from exposed heads. – Use insulated boots or other footwear. – Bring a change of dry clothing in case work clothes become wet. – Except the innermost layer, do not wear tight clothing. Loose clothing provides better ventilation for heat to go away from the body. – Do not disregard the wetting effects of perspiration. Often, wicking and venting of the body's sweat and heat are more important than protecting from rain or snow. Drink lots liquids; it is easy to become dehydrated in cold weather. – Avoid caffeine and alcohol. – Do extraneous work during the warmer parts of the day. – Implement a buddy system to watch for signs of cold stress. – Avoid fatigue when possible since energy is needed to keep muscles warm. – Frequently rest and consume warm, high calorie food and complex carbohydrates to maintain energy reserves. Control temperatures to the best of your ability. – Shielding work areas from drafts or wind will reduce

wind chill. – Use insulating material on equipment handles, especially metal handles, when temperatures drop below 30° F. – Use heaters to warm workers. Increase training to promote safety awareness. Discuss vital information on cold stress recognition and treatment. – Supervisors, workers and coworkers need to watch for signs of cold stress and encourage workers to interrupt their work when they are extremely uncomfortable. Losing an employee is worse than losing minutes. – Supervisors are responsible for ensuring work schedules in cold conditions provide appropriate rest periods. They should also ensure liquids are available. – Supervisors should implement appropriate engineering controls, personal protective equipment and work practices to reduce the potential for cold stress. – Every prevention measure should be incorporated into relevant health and safety training plans.