**Topic SM039 – Cold Stress**

**Introduction**
Cold temperatures and increased wind speed (wind chill) cause heat to leave the body more quickly, putting workers at risk of cold stress. Anyone working in the cold may be at risk, e.g., workers in freezers, outdoor agriculture, and construction. According to the U.S. Bureau of Labor Statistics (BLS), in 2017, there were over 20,000 occupational injuries related to ice, sleet, and snow.

**Hazards**
The hazardous effects of cold on the body may include dehydration, numbness, shivering, frostbite, immersion foot (trench foot), and hypothermia. Once the body loses the ability to maintain its normal temperature, the body temperature lowers and other symptoms such as violent shivering, slow or slurred speech, confusion, hallucinations, a weak and irregular pulse, or unconsciousness occurs. Certain people are more susceptible than others to cold stress. People who are not physically fit, have a chronic illness, drink alcohol, or take drugs (including prescription drugs), are wet or damp from work or weather, are fatigued, are exposed to vibration from tools, don't wear the right clothing, or are not used to working in cold have a higher risk from cold stress.

**Important Tips to Prevent Cold Stress**
- Employers can help protect workers by providing training, controlling temperature and wind when possible, by using heaters and windbreaks, and rotating workers in cold jobs so that no one is exposed too long.
- Wear proper clothing for cold, wet, and windy conditions.
- Take frequent, short breaks in warm, dry shelters.
- Avoid exhaustion or fatigue.
- Keep extra clothing handy in case clothes get wet.
- Drink warm, sweet beverages and avoid drinks with caffeine or alcohol.
- Eat warm, high-calorie foods.
- Schedule work at warmest times.
- Use the buddy system - work in pairs so that one worker can recognize the danger signs.
- Keep first aid supplies and equipment available.
- Stay dry in the cold because moisture or dampness, even from sweating, can increase the rate of heat loss.

**Dressing properly is extremely important to preventing cold stress. Wear at least three layers of loose-fitting clothing. Layers provides better insulation.**
- An inner layer of thermal wear, wool, silk, or synthetic (polypropylene) to keep moisture away from the body.
- A middle layer of wool or synthetic to provide insulation even when wet.
- An outer wind and rain protection layer that allows some ventilation to prevent overheating.
- Insulated coat/jacket (water resistant if necessary).
- Knit mask to cover face and mouth (if needed).
- Hat that covers the ears. A hat will help keep the whole body warmer and reduce the amount of body heat that escapes from the head.
- Insulated gloves (water resistant if necessary) to protect the hands.
- Insulated and waterproof boots to protect the feet.

**Hypothermia**
- Mild symptoms:
  - An exposed worker is alert.
  - He or she may begin to shiver and stomp the feet to generate heat.
- Moderate to Severe symptoms:
  - The worker may lose coordination, become confused and disoriented.
  - He or she may be unable to walk or stand, pupils become dilated, pulse and breathing become slowed, and loss of consciousness can occur. Death may occur if help is not received immediately.
What can be done for a person suffering from hypothermia?
- Call 911 immediately in an emergency; otherwise seek medical assistance as soon as possible
- Move the person to a warm, dry area
- Remove wet clothes and replace with dry clothes, cover the body (including the head and neck) with layers of blankets; and with a vapor barrier (e.g., tarp or garbage bag). Do not cover the face
- If medical help is more than 30 minutes away:
  - Give warm sweetened drinks if alert (no alcohol), to help increase the body temperature. Never try to give a drink to an unconscious person
  - Place warm bottles or hot packs in armpits, sides of chest, and groin. Call 911 for additional rewarming instructions
- If a person is not breathing or has no pulse:
  - Call 911 for emergency medical assistance immediately
  - Treat the worker as per instructions for hypothermia
  - Check him/her for signs of breathing and for a pulse. Check for 60 seconds
  - If after 60 seconds the affected worker is not breathing and does not have a pulse, trained workers may start rescue breaths for 3 minutes
  - Recheck for breathing and pulse, check for 60 seconds
  - If the worker is still not breathing and has no pulse, continue rescue breathing
  - Only start chest compressions per the direction of the 911 operator or emergency medical services

Frostbite
- Reddened skin develops gray/white patches
- Numbness in the affected part
- Feels firm or hard
- Blisters may occur in the affected part (in severe cases)

What can be done for a person suffering from frostbite?
- Follow the recommendations described above for hypothermia
- Do not rub the affected area to warm it because this action can cause more damage
- Do not apply snow/water. Do not break blisters
- Loosely cover and protect the area from contact
- Do not try to rewarm the frostbitten area before getting medical help. E.g., do not place in warm water
- If a frostbitten area is rewarmed and gets frozen again, more tissue damage will occur. It is safer for the frostbitten area to be rewarmed by medical professionals
- Give warm sweetened drinks if the person is alert. Avoid drinks with alcohol

Immersion/Trench Foot
Non-freezing injury to the foot, caused by lengthy exposure to wet and cold environment. Can occur at air temperature as high as 60°F if feet are constantly wet. Symptoms include:
- Redness of the skin, swelling, numbness, blisters

What can be done for a person suffering from immersion foot?
- Call 911 immediately in an emergency; otherwise seek medical assistance as soon as possible
- Remove the shoes, boots, or wet socks and dry the feet

Conclusion
If you are working in an area where you are exposed to cold stressors, follow guidelines set by your company to help prevent injury. Always follow your company's policies and procedures.

❖ Any questions about the information in today's meeting?
❖ Does anyone have comments or feedback?