

COLD STRESS



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1. Purpose

- a. This section covers **H2 Enterprises, LLC (H2)** policy related to Cold Stress. The intent of this policy is to provide **H2** employees with general knowledge and guidelines enabling employees to anticipate, recognize, evaluate, and control Cold Stress hazards in the workplace.

2. Scope

- a. This Cold Stress Program is intended for support of, and use by company operations both in business units and project operations.

3. Regulatory References

- a. This Cold Stress Program is primarily intended to satisfy the following regulatory requirements:
 - i. 29 CFR 1926.20

4. Policy

- a. It is **H2** policy that Supervisors must exercise due diligence for worker safety when assigning work in cold environments by monitoring and taking the following into account:
 - i. Air temperature
 - ii. Wind chill factor
 - iii. Level of work effort (light, moderate or heavy)
 - iv. Work conditions (dry or wet)
- b. Wind Chill may be determined from local radio reports or by measuring the air temperature with a thermometer and estimating wind speed as follows:
 - i. 5 mph – light flag just moves
 - ii. 10 mph – light flag is fully extended by the wind
 - iii. 15 mph – raises a newspaper sheet above the ground
 - iv. 20 mph – capable of blowing snow
- c. A wind chill determination chart can be found online:
http://www.nws.noaa.gov/om/cold/wind_chill.shtml

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5. Responsibilities

a. Management

- i. Identify and assess tasks and occupations where there is the potential for cold stress
- ii. Implement and/or provide controls (engineering, administrative or personal protective equipment) to minimize cold stress
- iii. Provide training and education regarding cold stress, including early signs and symptoms of cold-related exposure

b. Supervision

- i. Monitor weather conditions and plan work to minimize the exposure of employees to conditions that could cause cold stress.
- ii. Ensure that employees are equipped with and wear protective outerwear when necessary.
- iii. Implement work/warm-up schedules when indicated by the equivalent chill temperature chart.
- iv. Upon observing, or being notified of, an employee experiencing the initial symptoms of frostbite or hypothermia, the supervisor is to ensure that the employee is moved to a warm location. If symptoms worsen or additional symptoms appear, the supervisor should ensure that the employee is examined by a medical professional.
- v. The supervisor must complete an Incident Report upon notification of potential frostbite or hypothermia.

c. Employees

- i. Adhere to all control measures or work procedures that have been designed and implemented to reduce exposure to conditions that could cause cold stress
- ii. Leave cold environments if signs or symptoms of cold-related stress appear
- iii. Wear all required cold temperature clothing and PPE
- iv. Immediately report any signs or symptoms of cold-related stress

6. Hazard Recognition & Control

a. Hazard Recognition

When the body is unable to warm itself, cold related stress may result. This may include tissue damage and possibly death. Four factors contribute to cold stress: chilly air temperatures, high velocity air movement, dampness of the air, and contact with chilly water or surfaces. A cold environment forces the body to work harder to maintain its

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temperature. Chilly air, water, and snow all draw heat from the body. Wind chill is the combination of air temperature and wind speed. For example, when the air temperature is 40°F, and the wind speed is 35 mph, your exposed skin receives conditions equivalent to the air temperature being 11° F. While it is obvious that below freezing conditions combined with inadequate clothing could bring about cold stress, it is also important to understand that it can also be brought about by temperatures in the 50's coupled with some rain and wind.

When in a cold environment, most of your body's energy is used to keep your internal temperature warm. Over time, your body will begin to shift blood flow from your extremities (hands, feet, arms, and legs) and outer skin to the core (chest and abdomen). This allows exposed skin and the extremities to cool rapidly and increases the risk of frostbite and hypothermia. Combine this with chilly water, and trench foot may also be a problem.

- i. *Hypothermia*, which means "low heat", is a potentially serious health condition. This occurs when body heat is lost faster than it can be replaced. When the core body temperature drops below the normal 98.6° F to around 95° F, the onset of symptoms normally begins. The person may begin to shiver and stomp their feet to generate heat. Workers may lose coordination, have slurred speech, and fumble with items in the hand. The skin will likely be pale and cold. As the body temperature continues to fall, these symptoms will worsen and shivering will stop. Workers may be unable to walk or stand. Once the body temperature falls to around 85° F, severe hypothermia will develop and the person may become unconscious, and at 78°, the person could die.

Anyone working in a cold environment may be at risk for cold stress. However, older people may be at more risk than younger adults, since older people are not able to generate heat as quickly. Certain medications may prevent the body from generating heat normally. These include anti- depressants, sedatives, tranquilizers and others.

Treatment depends on the severity of the hypothermia. For cases of mild hypothermia, move to warm area and stay active. Remove wet clothes and replace with dry clothes or blankets and cover the head. To promote metabolism and assist in raising internal core temperature, drink a warm (not hot) sugary drink. Avoid drinks with caffeine. For more severe cases, do all the above, plus contact emergency medical personnel (Call 911 for an ambulance), cover all extremities completely, place very warm objects, such as hot packs or water bottles on the victim's head, neck, chest and groin. Arms and legs should be warmed last. In cases of severe hypothermia, treat the worker very gently and do not apply external heat to re-warm. Hospital treatment is required.

If worker is in the water and unable to exit, secure collars, belts, hoods, etc. to maintain warmer water against the body. Move all extremities as close to the torso as possible to conserve body heat.

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- ii. *Frostbite* occurs when the skin freezes and loses water. In severe cases, amputation of the frostbitten area may be required. While frostbite usually occurs when the temperatures are 30° F or lower, wind chill factors can allow frostbite to occur in above freezing temperatures. Frostbite typically affects the extremities, particularly the feet and hands. The affected body part will be cold, tingling, stinging or aching followed by numbness. Skin color turns red, then purple, then white, and is cold to the touch. There may be blisters in severe cases.

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. If help is delayed, immerse in warm (maximum 105 °F), not hot, water. Do not pour water on affected 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.

- iii. *Trench Foot*, or immersion foot, is caused by having feet immersed in chilly water at temperatures above freezing for extended periods of time. It is like frostbite, but considered less severe. Symptoms usually consist of tingling, itching or burning sensation. Blisters may be present.

Soak feet in warm water, then wrap with dry cloth bandages. Drink a warm, sugary drink.

b. Hazard Controls

- i. *Engineering Controls* – Engineering controls can be effective in reducing the risk of cold stress. Radiant heaters may be used to warm workers. 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.
- ii. *Administrative & Training Controls* – Training in recognition and treatment is important. Supervisors, workers and coworkers should watch for signs of cold stress and allow workers to interrupt their work if they are extremely uncomfortable. Supervisors should also ensure that work schedules allow appropriate rest periods and ensure liquids are available. They should use appropriate engineering controls, personal protective equipment and work practices to reduce the risk of cold stress. These measures should be incorporated into the relevant health and safety plans. Workers exposed to cold environments should be under constant protective observation by other co-workers and supervision.
- iii. *Procedure or Work Practice Controls* – Work Practices and planning are important preventative measures. Drink plenty of liquids, avoiding caffeine and alcohol. It is easy to become dehydrated in wintry weather. If possible, heavy work should be scheduled during the warmer parts of the day. Take breaks out of the cold. Try to work in pairs to keep an eye on each other and watch for signs of cold stress. Avoid fatigue since energy is needed to keep muscles warm. Take

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frequent breaks and consume warm, high calorie food, such as pasta, to maintain energy reserves.

Regularly traveled walk ways and travel ways should be sanded, salted or cleared of snow and ice as soon as practical.

Employees must be aware of hazards and dangers of unstable buildup of snow and ice and the preventative measures to take to avoid incidents caused by these hazards.

Wintry weather supplies and PPE must be inspected regularly and restocked or replaced when necessary.

- iv. *PPE Controls* - Protective Clothing is the most important way to avoid cold stress. The type of fabric also makes a difference. Cotton loses its insulation value when it becomes wet. Wool, silk and most synthetics, on the other hand, retain their insulation even when wet. The following are recommendations for working in cold environments:
 - 1. Wear at least three layers of clothing. An inner layer of wool, silk or synthetic to wick 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.
 - 2. Wear a hat or hood. Up to 40% of body heat can be lost when the head is left exposed.
 - 3. Wear insulated boots or other footwear.
 - 4. Keep a change of dry clothing available in case work clothes become wet.
 - 5. Except for the wicking layer, do not wear tight clothing. Loose clothing allows better ventilation of heat away from the body.
 - 6. Do not underestimate the wetting effects of perspiration. Oftentimes wicking and venting of the body's sweat and heat are more important than protecting from rain or snow.

7. Training

H2 will provide Cold Stress training for all employees. Cold Stress is included in company orientation and all employees are trained upon hire.

- a. **Training Content** - Training will cover the following topics:
 - i. First aid treatment for cold induced injuries and/or illnesses
 - ii. Cold Stress Program and Policy
 - iii. Responsibilities

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iv. Hazard Recognition & Control

- b. **Personnel Training – H2** personnel shall receive the following training:
 - i. All employees shall receive their initial Cold Stress awareness training upon hire (orientation).
- c. **Training Frequency** - Training and re-training frequency shall be as follows:
 - i. Awareness training be refreshed semi-annually
- d. **Reports** -The supervisor must complete an Incident Report upon notification of potential frostbite or hypothermia.