

Section 5C: Workplace Health and Environmental Practices

Policy # 5: Cold Stress Prevention Plan
Effective Date: December 15, 2016
Last Revision Date: Original Policy

I. Purpose

Employees who are exposed to extreme cold or work in cold environments may be at risk of cold stress. Extreme cold weather is a dangerous situation that can bring on health emergencies in susceptible people, such as outdoor workers, and those who work in an area that is poorly insulated or without heat. This program provides the basic information for protection against cold stress. The Town of Mooresville will identify, evaluate, and control potential exposure of our employees to extreme temperature, wind, wet, and other cold-related factors. This policy does not provide rationale for employees to stop performing their required work duties. It does however provide some preventive and remedial measures to better protect town employees.

II. Scope

This plan applies to all regular, temporary, and intermittent employees whose primary job assignment involves outdoor work and may be exposed to environmental risk factors that could place the individual at risk of cold-related illness.

III. Definitions

Acclimatization or acclimate: The physiological (i.e., physical, mechanical, and biochemical) change that allows the human body to adapt or get used to the effects of a new physical environment or climate. After a period of acclimatization, the same physical activity will produce fewer cardiovascular demands.

Chilblains: are caused by the repeated exposure of skin to temperatures just above freezing to as high as 60°F. The cold exposure causes damage to the capillary beds (groups of small blood vessels) in the skin. This damage is permanent and the redness and itching will return with additional exposure. The redness and itching typically occur on cheeks, ears, fingers, and toes.

Frostbite: Occurs when the skin actually freezes and loses water. Frostbite usually affects the extremities. The affected body part will be cold, tingling, stinging, or aching, followed by numbness. The skin turns red in color, then purple, then white, and is cold to the touch. In severe cases, there may be blisters. In severe cases, amputation of the frostbitten area may be required.

Hypothermia: Occurs when body heat is lost faster than it can be replaced. When the core body temperature drops from the normal 98.6°F to around 95°F, symptoms generally begin. The employee may begin to shiver and stomp the feet in order to generate heat. Workers may lose coordination, experience

slurred speech, and fumble with items in their hands. The skin will likely be pale and cold. As the body temperature falls, symptoms will worsen and shivering will stop. At a body temperature below 85°F, severe hypothermia will develop and the person may become unconscious; at 78°F, death can occur. Treatment depends on the severity of the hypothermia.

Trench Foot, or **immersion foot**: is caused when the feet are immersed in cold water at temperatures above freezing for long periods of time. It is similar to frostbite, but considered less severe. Symptoms include tingling, itching, or a burning sensation.

IV. **Assignment of Responsibility**

A. Department Directors

1. Ensure cold stress prevention within their department meet the requirements of this plan.
2. Provide support and financial resources for the implementation of departmental specific cold stress prevention.
3. Ensure that all affected personnel within their department receive proper training on this policy.

B. Risk Management Department

1. Conduct cold related hazard assessments when needed or as requested.
2. Assist departments in the selection of appropriate engineering controls, work practices and personal protective equipment.
3. Review the Cold Stress Prevention policy periodically and as needed.

C. Supervisors, Managers, and Crew Leaders

1. Monitor work areas using cold stress assessment techniques to identify employees that may be exposed to cold stress.
2. Ensure the Cold Stress Prevention policy is implemented, understood, and followed by all affected employees under their supervision.
3. Monitor weather conditions and closely observe employees.
4. Ensure affected employees are appropriately acclimated to the cold.
5. Identify work areas, processes, or tasks that expose employees to cold related injuries and illnesses.
6. Ensure affected employees under their supervision (including new hires, temporary, and intermittent employees) receive training on the signs and symptoms of cold related injuries and illnesses.
7. Ensure affected employees have personal protective equipment, if applicable.

D. Employees

1. Report cold stress related injury and illness symptoms to the supervisor.
2. Comply with the provisions of the Cold Stress Prevention policy.
3. Monitoring personal physiological conditions for signs of cold stress.
4. Report cold stress concerns for co-workers and assist them as needed (team effort).

V. Policy and Compliance Methods

- A. Hazard Assessment- Supervisors are responsible for conducting the initial inspection and hazard assessment of all work areas and environments where cold conditions are anticipated or may occur. The hazard assessment shall consider all cold stress factors and employee sensitivity factors as described below.
- B. Cold Stress Factors- Four factors contribute to cold stress: cold temperatures, high or cold wind, dampness and cold water. A cold environment forces the body to work harder to maintain its core temperature of 98.6° F. Cold air, water, and snow all draw heat from the body. While it is reasonable apparent that below freezing conditions combined with inadequate clothing could bring about cold stress, it is important to understand that it can also be brought about by temperatures in the 50's coupled with rain and/or wind.
- C. Employee Sensitivity Factors- The following worker cold sensitivity factors will also be considered in evaluating the potential for cold stress:
- Age
 - Weight
 - Degree of physical fitness
 - Poor circulation
 - Degree of acclimatization
 - Metabolism
 - Medications
 - Prior cold injury
 - Heavy work load
 - Use of alcohol or drugs
 - Medical condition
- D. Cold Stress Monitoring- Monitoring for cold stress should begin whenever outside temperatures drop below 40°F. Supervisors shall use the temperature and wind speeds to obtain the wind chill index (Attachment A). A cold stress assessment of the work area shall be conducted prior to the start of work. The wind chill index shall be used to evaluate the cold stress hazard.
- E. Training- All employees who are exposed or potentially exposed to cold stress will receive training regarding cold stress-related injuries and illnesses and prevention measures at the time of assignment to work activities that involve cold conditions.

The following topics will be covered during safety training for cold stress:

1. Knowledge of the hazards of cold stress, including environmental factors that might contribute to the risk of cold-related illness (temperature, humidity, air movement, wind chill, workload activity and duration, and personal protective equipment)
 2. Recognition of predisposing factors, danger signs, and symptoms (e.g., age, degree acclimatization, medical conditions, consuming alcohol, caffeine use, nicotine use, and use of medications that affect the body's response to cold)
 3. The importance of staying hydrated
 4. Proper use of warming shelters
 5. The buddy system
 6. Awareness of first-aid procedures for hypothermia and other cold stress-related illnesses.
 7. The procedure for reporting signs and symptoms of cold-related illness in themselves and co-workers
- F. Cold Stress Controls- Controls are mechanisms that are implemented to minimize or eliminate exposures to hazards, such as extreme cold. There are three types of controls that may be used to reduce exposure to heat hazards and heat-related illnesses and injuries. Each person and situation is unique, so controls and their applications may vary. These controls types include:

1. **Engineering Controls** are physical changes made to the work environment and may include any of the following measures.
 - a) Use of on-site sources of heat, such as air jets, radiant heaters, or contact warm plates.
 - b) Shielded work areas from drafty or windy conditions.
 - c) Heated shelter to provide a rest area for employees who experience prolonged exposure to cold conditions.

2. **Administrative Controls** are work practices that may be used to limit cold stress exposures such as:
 - a) Establish and implement acclimatization schedules.
 - b) Establish employee work and rest intervals.
 - c) Schedule work for the warmest part of the day.
 - d) Rotate employees
 - e) Schedule routine maintenance and repair work in cold areas for the warmer seasons of the year.
 - f) Allow adequate recovery time after exposure.
 - g) Provide warm liquids.
 - h) An extra change of clothing available in case work clothing becomes wet.
 - i) Establish a buddy system and schedule employees to work in pairs outdoor.

3. **Personal Protective Equipment.** Supervisors shall determine the types of personal protective equipment (PPE) that may be used to minimize cold stress after engineering controls and work practices have been implemented. Examples of PPE that may be used include:
 - a) Insulated footwear that protects against the cold and dampness.
 - b) Hats, hoods, or face covers to prevent heat loss from the head
 - c) Insulated gloves that protect against the cold and dampness
 - d) An outer layer of clothing to break the wind and allow some ventilation (like Gore-Tex® or nylon.

VI. Authorization

Approved by:



N. Erskine Smith, Town Manager

December 15, 2016

Date

VII. Revision(s)

- A. Dec. 15, 2016. Original policy approval and implementation.

VIII. Attachments

- A. Wind Chill Chart

Attachment A:



Wind Chill Chart

