

1.1 PURPOSE

- 1.1.1 The purpose of this policy is to protect TERRY R PITT CONSTRUCTION workers from potential adverse health and safety risks associated with working in low temperature situations by providing reasonable solutions for worksites with low temperature operations. It is intended primarily for outdoor workers but applies to all TERRY R PITT CONSTRUCTION employees who work in low temperature conditions for significant time periods.

1.2 ACCLIMATIZATION

- 1.2.1 By sweating, shivering, and changing the rate of blood flow, the body can adapt to a fairly wide range of temperatures. However, there are limits to what the body can adapt to and its ability to maintain its core temperature can fail.
- 1.2.2 To stay warm in cold environments, the body shivers. Moving muscles helps to increase heat production.
- 1.2.3 How cold or hot you feel depends on six main factors - air temperature, radiant heat, relative humidity, moving air, physical exertion, and clothing.
- 1.2.4 Workers can adapt to different temperatures through a process called acclimatization.
- 1.2.5 Workers must be monitored to ensure they are adapting to working at different temperatures. When working in new conditions, people need at least four to seven working days to acclimatize, but the process may take up to three weeks. A scheduled exposure is recommended (For example, doing physical work for less than a full working day on the first day and slowly increasing the time spent working over the next week).

1.3 COLD WEATHER

- 1.3.1 Cold is a physical hazard in many workplaces. When the body is unable to warm itself, cold related illnesses and injuries could occur. Exposure has mental and physical effects. Watch out for signs of unusual behaviors in yourself and coworkers. These are indicators the person is not coping well with the temperature and their condition should be investigated.
- 1.3.2 Indicators include:
- 1.3.2.1 Loss of alertness, slurred speech, fatigue, lethargy, or apathy.
- 1.3.2.2 General discomfort and a loss of sensitivity and dexterity in fingers, hands, and toes.
- 1.3.2.3 At low temperatures, deep muscles can be affected, reducing muscle strength and flexibility.

1.4 POTENTIAL COLD EXPOSURE SAFETY HAZARDS

- 1.4.1 Winter clothing, head protection, gloves, and boots used while working in the cold can restrict movement and hoods or hats may obstruct side vision.
- 1.4.2 Cold affects dexterity, affecting skill and ease of using the hands.
- 1.4.3 Extremely cold conditions adversely affect mental skills and coordination.
- 1.4.4 The mobility of fingers slows down, which affects task performance.
- 1.4.5 Cold affects grip force and the skin's ability to sense temperature and pain.
- 1.4.6 Cold exposure reduces muscle power and time to exhaustion.
- 1.4.7 Cold exposure aggravates vibration, inducing white finger disease, which makes manual work painful.
- 1.4.8 Special care is needed while using ladders or working on elevated platforms in snow/ice.
- 1.4.9 Power tools and equipment need special care to be operational in a cold environment.
- 1.4.10 Heavy snowfall and blizzards can produce very cold conditions and restrict visibility.
- 1.4.11 Workers in remote areas need to take extra precautions and orient themselves to cold weather operations and emergency survival.
- 1.4.12 Working on ice and frozen bodies of water requires ice testing and knowledge of ice bearing capacity.
- 1.4.13 All workers should be informed of the dangers and destructive potential caused by unstable snow buildup, sharp icicles, and ice dams and know how to prevent accidents caused by them.

1.5 POTENTIAL COLD EXPOSURE HEALTH HAZARDS

- 1.5.1 Frost nip and frostbite
 - 1.5.1.1 The mildest form of a freezing cold injury, frost nip, occurs when ears, noses, cheeks, fingers, or toes are exposed to the cold and the top layers of the skin freeze. The skin of the affected area turns white and may feel numb. The skin feels hard but the deeper tissue still feels normal. The affected skin may peel.
 - 1.5.1.2 Frostbite happens when the skin freezes and loses water. The most vulnerable parts of the body are the nose, cheeks, fingers, ears, and toes. Exposure to extreme cold or contact with extremely cold objects can cause frostbite. It may also occur at normal temperatures from contact with cooled or compressed gases.
 - 1.5.1.3 Blood vessels may be severely and permanently damaged and blood circulation may stop in the affected tissue. In mild cases, symptoms include inflammation (redness and swelling) of

the skin accompanied by slight pain. In severe cases, tissue damage without pain can happen. Frostbitten skin is highly susceptible to infection and gangrene.

- 1.5.1.4 Symptoms of frostbite include coldness, tingling, or aching in the affected area followed by numbness, changes in skin color to red, then purple, then white or greyish-yellow. Skin will be cold to the touch. A person may also have initial pain that subsides as the condition gets worse, along with blisters.
- 1.5.1.5 Severe cases of frostbite may result in amputation and typically occur at temperatures less than 30°F but can occur at higher temperatures when wind chill is considered.

1.5.2 Chilblains

- 1.5.2.1 Chilblains, a mild cold injury, is caused by prolonged and repeated exposure for several hours to air temperatures ranging from 32°F - 60°F. The affected area shows signs of redness, swelling, tingling, and pain.

1.5.3 Immersion foot

- 1.5.3.1 Also known as trench foot, immersion foot results from feet being immersed in cold water at temperatures below freezing for extended periods of time. Depending on temperature, symptoms may begin within several hours to many days, averaging 3 days. The primary injury is to nerve/muscle tissue.
- 1.5.3.2 Symptoms are similar to frostbite, but are often less severe, and include tingling and numbness, itching, burning, pain, swelling, leg cramps, blisters, or bleeding under the skin. Skin may be red initially and turn blue or purple as it progresses. Severe cases can lead to gangrene.

1.5.4 Snow blindness

- 1.5.4.1 When working outdoors in the winter, you may face exposure to snow blindness. This is normally a temporary loss of vision caused by exposure to bright sunlight reflected from snow or ice. It can occur on cloudy or overcast days or during snowstorms. Snow blindness is painful, because the ultraviolet rays of the sun burn the cornea.
- 1.5.4.2 Symptoms include a sensation of grit in the eyes, pain in and over the eyes that increases with eyeball movement, inflammation, red, teary eyes, or headache that intensifies with continued exposure to light.
- 1.5.4.3 In most cases, snow blindness lasts no more than one day and goes away after a person relieves the fatigue of the retina by resting indoors and away from bright light. In rare cases, prolonged exposure to the reflected light can lead to permanent vision loss.

1.5.5 Hypothermia

- 1.5.5.1 Hypothermia occurs when the body is unable to compensate for its heat loss and the body's core temperature starts to fall. First a person feels cold followed by pain in exposed parts of the body. As the body's core temperature continues to drop, the feeling of cold and pain starts to

diminish due to increasing numbness.

- 1.5.5.2 As the body continues to cool, you experience shivering, stomping of the feet to generate heat, loss of coordination and/or muscular weakness, slurred speech, an inability to think clearly, drowsiness, and skin that is pale and cold. This condition usually occurs when the body's internal or core temperature falls below 95°F. Additional symptoms include shivering coming to a stop, diminished consciousness, and dilated pupils. At such a low body temperature, the brain is affected and a person cannot think or move well. This makes hypothermia especially dangerous as the person may not know what is happening or be able to do anything about it. When the body's core temperature reaches 81°F, coma sets in.

1.6 COLD EXPOSURE HAZARD CONTROL

- 1.6.1 A cold environment challenges the worker in three ways: air temperature, air movement (wind speed), and humidity (moisture).
- 1.6.2 In order to work safely, proper insulation, such as layered protective clothing, physical activity, and controlled exposure to cold through a work warm-up schedule needs to be implemented.
- 1.6.3 The best way to control a hazard is to eliminate it. This step is impracticable when the hazard is an outdoor environmental condition.
- 1.6.4 Equipment is prone to break down at extreme temperatures. Safety harnesses are tested to comply with standards ranging down to -31°F.
- 1.6.5 Provide a heated shelter for workers to work in where possible, but at minimum, as a shelter for work warm-up breaks.
- 1.6.6 Use controls such as enclosures and heating systems where practical and possible.
- 1.6.7 Protect the body from frostbite with an onsite source of heat. Consider air heaters, radiant heaters, or contact warm plates. Heaters that emit carbon monoxide should be used with caution.
- 1.6.8 Shield work areas from drafts or winds as much as possible.
- 1.6.9 Use thermal insulating material on equipment, such as metal handles. Use insulating barrier/pads where workers need to sit, kneel, or stand on concrete or steel.
- 1.6.10 Use a work warm-up schedule. Provide a warm shelter or vehicle for workers to warm up.
- 1.6.11 Allow a period of adjustment to the cold before assigning a full work schedule.
- 1.6.12 Minimize time outdoors and do as many tasks indoors as possible.
- 1.6.13 Minimize activities that reduce blood circulation, such as sitting or standing, for long periods.

Cold Weather Safety

- 1.6.14 Ensure backup for workers in isolated cold environments, indoor or outdoor.
- 1.6.15 Avoid use of alcohol or drugs that may impair judgment while working in a cold environment. Alcohol increases heat loss by dilating the blood vessels and it may prevent a person from shivering, which serves as a warming mechanism.
- 1.6.16 Prevent dehydration and keep energy levels up by consuming warm, caffeine-free, non-alcoholic drinks and soup. TERRY R PITT CONSTRUCTION will provide plenty of liquids to affected workers and discourage the use of caffeine and alcohol, which can lead to dehydration. TERRY R PITT CONSTRUCTION will address work schedules so that work is performed in the warmest part of the day, when possible. Employees will be encouraged to take frequent breaks and to eat a high calorie diet to maintain energy.
- 1.6.17 Select protective clothing to suit the cold, the job, and the level of physical activity. Occupations have different requirements for workers. Outer layer must be fire retardant material. Employees who work in cold, wet, or windy environments will wear proper cold weather protection.
- 1.6.18 Wear several layers of clothing rather than one thick layer. Multiple layers of clothing help create air pockets that retain body heat. Layering also makes adapting to changes in weather and level of physical exertion easier, by removing layers and putting them back as conditions and work effort change. Affected employees must wear three layers of clothing. The inner layer should be wool, silk, or synthetic to wick moisture away from the body; the middle layer should be wool or synthetic to provide insulation, particularly when wet; the outer layer should protect against the wind and rain and allow proper ventilation. Clothing should be changed when it becomes soaked with sweat, and TERRY R PITT CONSTRUCTION will ensure its employees are aware of the wetting effects of perspiration.
- 1.6.19 Use safety footwear that protects against the cold and dampness. Felt-lined, rubber bottomed, leather topped boots with removable felt insoles are best suited for heavy work in cold since leather is porous and allows for perspiration to evaporate. However, if work involves standing in water or slush, waterproof boots need to be worn. Waterproof boots protect the feet from getting wet, but since they prevent perspiration from escaping, socks may become damp quicker and increase the risk for frostbite.
- 1.6.20 Footwear should be insulated and fit comfortably when socks are layered. Tight fitting footwear restricts blood flow. Arctic rated winter boots are advisable. Boots made of ballistic nylon offer the best protection against cuts. Rubber soles are suited to wet weather and snow, and hobnail boots, grip soles, or cork soles to rough terrain.
- 1.6.21 Protect head, face, and hands to prevent heat loss and frostbite. Use the appropriate hardhat liner with face shield, facemask, or balaclava. Wear mittens instead of gloves when fine manual work is not required or gloves with nylon over-mitts that can be taken off. Arctic gauntlet mitts are advisable. Leather gloves with ballistic nylon reinforcement on the back offer good grip and absorb some vibration. Be careful not to get gloves caught in the moving parts of machinery.

Cold Weather Safety

- 1.6.22 Fine work performed with bare hands for more than 10-20 minutes in an environment below 60°F requires special measures to keep workers' hands warm. These measures may include warm air jets, radiant heaters (fuel burning or electric), or contact warm plates.
- 1.6.23 Metal handles of tools and control bars should be covered by thermal insulating material for temperatures below 30°F.
- 1.6.24 Workers should wear gloves where fine manual dexterity is not required and the air temperature falls below 60°F for sedentary, 39°F for light, and 19°F for moderate work.
- 1.6.25 To prevent contact frostbite, workers should wear insulated gloves when surfaces within reach (especially metallic surfaces) are colder than 19°F. Workers are to avoid skin contact with these surfaces.
- 1.6.26 Tools and machine controls used in cold conditions should be designed for operation with gloves.
- 1.6.27 Remove outer layer of clothing when entering shelter and loosen other clothing to let sweat evaporate. A change of clothing may be necessary as sweat dampened clothes lose their insulation value.
- 1.6.28 Remove layers as you begin to sweat to avoid losing insulation value, but do not forget to put them back on when you stop working. Do not wait until you get cold.
- 1.6.29 Use caution when handling gasoline. With a freezing point of -69°F and a high evaporation rate, contact with the skin can be very dangerous.
- 1.6.30 Be aware of symptoms of cold exposure at the jobsite. Workers showing signs of shivering, frostbite, fatigue, drowsiness, irritability, or euphoria should immediately return to shelter.
- 1.6.31 An injury while working alone could lead to severe cold exposure. Avoidance of cold injury is usually a matter of recognizing the potential for cold stress and dressing appropriately for protection. There is a great deal of individual variation in tolerance to cold. Good nutrition, appropriate warm-up procedures, preventive measures, and early recognition of cold stress will minimize problems.
- 1.6.32 Workers should not work alone in the cold for long periods of time.
- 1.6.33 Regularly used walkways and travel ways will be sanded, salted, or cleared of snow and ice as soon as practicable.
- 1.6.34 Regular inspections on cold weather supplies (ex. hand warmers, jackets, shovels, etc.) should be carried out to ensure that supplies are always in stock.
- 1.6.35 TERRY R PITT CONSTRUCTION will identify the jobs, tasks, and/or employees who are at risk for cold exposure and conduct a risk assessment based on job classification.

1.7 FIRST AID FOR COLD EXPOSURE

- 1.7.1 Prevent frost nip and frostbite by covering exposed skin surfaces. Cover the cheeks, chin, nose, ear lobes, and forehead. A thin layer of a product such as petroleum jelly may help.
- 1.7.2 Treat frost nip or frostbite by gentle rewarming (ex. holding the affected tissue next to the unaffected skin of another person). For cold-induced injuries, never rub the affected areas as ice crystals in the tissue could cause damage if the skin is rubbed. Do not use hot objects such as hot water bottles or electric blankets to rewarm the area or person.
- 1.7.3 Frostbite or immersion
 - 1.7.3.1 Warm frostbitten area gradually with body heat. Do not rub.
 - 1.7.3.2 Do not thaw hands or feet unless medical aid is distant and there is no chance of refreezing. If skin freezes again, severe tissue damage can result. Thawing is better done at a hospital. Loosely cover the affected area with sterile gauze dressing.
 - 1.7.3.3 Quickly transport the victim to a health care facility.
- 1.7.4 Hypothermia
 - 1.7.4.1 Carefully move the worker to shelter. Sudden movement or rough handling can upset heart rhythm.
 - 1.7.4.2 Remove wet clothing and wrap in warm covers. Cover the worker's head. If medical help is not available immediately, body-to-body contact can help rewarm the victim slowly. Do not use hot water bottles or electric blankets.
 - 1.7.4.3 Give warm, sweet drinks that are caffeine-free and non-alcoholic unless the victim is rapidly losing consciousness, is unconscious, or is convulsing.
 - 1.7.4.4 Call for help and quickly transport the victim to an emergency medical facility.
 - 1.7.4.5 Monitor breathing. Perform CPR if necessary. Continue to provide CPR until medical aid is available. The body slows when it is very cold and hypothermia victims that appeared dead have been successfully resuscitated.

1.8 TRAINING

- 1.8.1 TERRY R PITT CONSTRUCTION workers will be trained on the hazards and first aid measures for working in a cold environment.
- 1.8.2 Prior to supervising employees working in outdoor environments with cold exposure, supervisors will also receive training on the following topics:
 - 1.8.2.1 Content and procedures contained in this policy
 - 1.8.2.2 Cold illness prevention procedures

- 1.8.2.3 Proper first aid treatment for a worker showing signs and symptoms consistent with possible cold related illness
- 1.8.2.4 Procedures to follow when a worker exhibits symptoms consistent with possible cold illness, including emergency response procedures
- 1.8.3 Early recognition of cold exposure symptoms is essential in preventing serious or permanent disorders or conditions. Supervisors and workers involved in cold weather operations who may be exposed may be trained on:
 - 1.8.3.1 Identifying hazards and common signs of cold related illnesses
 - 1.8.3.2 Procedures for reporting signs and symptoms of cold related illness to a supervisor or person in charge
 - 1.8.3.3 Environmental factors that might contribute to the risk of cold related illness (temperature, humidity, air movement, workload activity and duration, and personal protective equipment)
 - 1.8.3.4 Personal factors that may increase susceptibility to cold related illness (age, degree of acclimatization, medical conditions, alcohol consumption, nicotine use, or medications that affect the body's response to cold temperatures)
 - 1.8.3.5 Acclimatization process
 - 1.8.3.6 Importance of removing wet clothing or personal protective equipment during breaks
 - 1.8.3.7 Importance of drinking warm, sweetened fluids frequently
 - 1.8.3.8 How to administer first aid in the event of a cold weather-related injury or illness
- 1.8.4 TERRY R PITT CONSTRUCTION supervisors and workers exposed to cold weather will receive initial and annual training regarding the hazards of cold stress, health effects, proper rewarming procedures, how to recognize symptoms of cold weather injuries, first aid techniques, protective clothing, the company's buddy system, procedures to follow in the event of vehicle breakdowns, and proper hydration and eating habits for cold weather work.
- 1.8.5 All training will be documented.