Cold Weather Safety Program

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I. INTRODUCTION
   a. Cold Stress
      1. Employers must consider cold stress as a workplace hazard. Workers that work outside in the winter, fall, and spring months can be exposed to low temperatures and wind chill. Indoor operations that involve refrigeration also create cold stress hazards. Under the OSHA General Duty Clause employers are responsible for the safety and health of their employees, cold stress is covered under this statute.
      2. Cold stress is the loss of body heat to the environment. Low temperature, wind, and wetness have a combined effect on the body to create cold stress, injuries, and illness. Cold-related disorders such as hypothermia and frostbite can kill or injury workers. Employers and employees should be aware of cold stress hazards, cold-related disorders and how to treat and prevent them.

II. PURPOSE
   a. The purpose of this program is to prevent injuries due to exposure to extreme cold temperatures

III. SCOPE
   a. This program applies to all employees at Hillis Group, LLC worksites and facilities, including but not limited to employees of sub-contractors, inspectors, delivery drivers, and visitors.

IV. KEY RESPONSIBILITIES
   a. Managers and Supervisors
      1. Responsible to control and enforce this plan and to see that all their employees and contractors that are affected by this procedure, have the knowledge and understanding required for compliance with the provisions of this program.
      2. Ensure employees are trained and comply with the requirements of this program.
   b. Employees
      1. Employees who are affected by this program are required to attend training on an annual basis.
      2. Employees are required to follow the provisions of this program.

V. SOURCES OF HEAT LOSS
   a. Body heat is lost to the environment by four different routes:
      1. Radiation;
         1. The loss of body heat to the colder air in the environment due to the temperature difference.
      2. Conduction;
         1. The loss of heat through direct contact between objects, heat transfer. Water conducts heat away from the body 25 times faster than air. Usually conductive heat loss accounts for about 2% of the overall loss, but with wet cloths the loss increases to around 5 times.
      3. Convection;
         1. When warm molecules against the surface of the body are moved away and replaced with cold molecules. Wind chill is an example of the effects of air convection, the wind chill table gives a reading of the amount of heat lost to the environment relative to still air temperature.
4. Evaporation;
   1. When heat and fluid is lost to the environment from sweating and respiration, a decreased fluid level makes the body more susceptible to hypothermia and other cold injuries.

VI. THE BODY’S REACTION TO COLD
   a. The body’s first response to cold stress is to conserve body heat by reducing blood circulation through the skin. This makes the skin an insulating layer.
   b. Next, the muscles in the body begin to shiver, which increases the rate of metabolism. Shivering is a good sign that cold stress is significant and that hypothermia may be present.
   c. The primary response to cold stress is behavioral.
      1. Behaviors include increasing clothing insulation, increasing activity, and seeking warmth.

VII. SAFETY PROBLEMS
   a. Many of the safety problems created by the cold are similar to the problems from heat stress. Cold stress can make workers fatigued or drowsy which can lead to accidents.
   b. Eyeglasses can become fogged and walking surfaces slippery increasing the risk for slips and falls.
   c. Decreased body temperature and physical discomfort promote irritability, anger, and other emotional states which can effect workers alertness and attitudes towards safe working procedures.
   d. Useful physical and mental work is limited when severe shivering occurs.

VIII. HEALTH PROBLEMS (LOW TEMP + WIND + WETNESS = COLD INJURIES & ILLNESS)
   a. Excessive exposure to cold stress can bring about a variety of cold-induced disorders. It is important that workers and supervisors know what the signs and symptoms of these disorders are, and how to prevent and treat them.
   b. Hypothermia.
      1. Normal body temperature (98.6 F / 37 C) drops to or below 95 F (35 C). The core body temperature decreases to a level at which normal muscular and brain functions are impaired. Wet clothes dramatically increase the risk of developing hypothermia. Hypothermia can lead to death if the body is not treated.
      2. Symptoms - Chills, pain in extremities, fatigue, and drowsiness.
      3. Signs - Euphoria, loss of coordination, violent shivering, slurred speech, slow and weak pulse, irrational behavior, collapse, unconsciousness, body temperature < 95 F, pupils dilate, and pale skin.
      4. Causes - Cold temperatures, wetness, improper clothing, exhaustion, dehydration, poor food intake, no knowledge of hypothermia.
      5. First Aid - Move to warm dry area, remove wet clothing, wrap in dry blankets, modest external warming (external heat packs), drink warm sweet fluids, and take to the hospital.
   c. Frostbite.
      1. Freezing in deep layers of skin and tissue, usually affects the finger, hands, toes, feet, ears, and nose.
      2. Symptoms - Burning sensation at first, coldness, numbness, and tingling.
      3. Signs - Skin color white or grayish yellow to reddish violet to black, blisters, and skin feels wooden.
      4. Causes - Exposure to cold, and poor circulation.
5. **First Aid** - Move to warm area and remove wet clothing, external warming (warm water), drink warm sweet fluids, do not rub affected area, and take to the hospital.

   d. Trench Foot is caused from wet feet and exposure to cold temperatures above freezing.
   1. Symptoms - Severe pain, tingling, and itching in feet and legs.
   2. Signs - Edema, blisters, reduced touch sensation.
   3. Causes - Exposure to cold (above freezing) and dampness. First Aid - Similar to frostbite.

**IX. CONTROL METHODS**

   a. The most effective controls for cold stress is training and work practices, workers must know how to protect themselves from the cold.
      1. Workers should replace wet clothing as soon as possible in temperatures less than 36°F and continuously be replacing fluid with warm, sweet, non-caffeine and non-alcoholic drinks.
      2. Clothing should be layered and gloves or mittens should be worn in cold weather.

**X. ENGINEERING CONTROLS.**

   a. Provide warming shelters if exposures occur below 19 F.
   b. Provide for general or spot heating, including hand warming.
   c. Reduce conductive heat transfer (Example: do not use metal chairs.)
   d. Provide wind barriers

**XI. ADMINISTRATIVE AND WORK PRACTICE CONTROLS.**

   a. Train workers about cold stress, cold-related disorders, and first aid.
   b. Set up work-rest cycles according to ACGIH TLVs Book. (American Conference of Industrial Hygienists)
   c. Schedule work at warm times.
   d. Move work to warm areas.
   e. Encourage self-pacing and extra breaks if required.
   f. Use the buddy system (work in pairs).
   g. Select proper clothing for cold, wet, and windy conditions.
   h. Drink warm, sweet fluids, avoid caffeine and alcohol.
   i. Recognize the environmental conditions that lead to cold stress.

**XII. PERSONAL PROTECTION.**

   a. Properly selected, insulated, and layered clothing.
   b. Waterproof boots and gloves.
   c. Eye protection for snow or ice-covered terrain.
   d. Personal heaters.
Controlled Document

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Originator: S.C. Brockman

Safety Committee Review Date:_______________________
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