COLD STRESS SAFETY MEETING

THE HAZARDS OF COLD STRESS

Hypothermia

A decrease in the core body temperature to a level at which normal muscular and cerebral functions are impaired. This process begins when the core body temperature drops below 36°C (96.8°F) The quiet symptoms of potentially fatal cold-related disorders, including hypothermia, often go undetected until the worker's health is endangered.

Frostbite

Two factors, the external temperature, and the body's blood flow, affect tissue temperature in cold weather. All cold-related injuries are inherently affected by the dynamics of blood flow in the peripheral regions of the body. As peripheral circulation is reduced to prevent heat loss to the body core, cold-related injuries are more likely to occur.

Early signs of frostbite can include, cold, hard, blistering, discolored, or waxy looking skin. Symptoms may include numbness, tingling, prickling, or burning sensations.

ASSESSING THE RISK

Production will assess the risk and implement safe work procedures when workers might be at risk of hypothermia or cold-related injuries. Workplace conditions that may alert the production to conduct a cold stress risk assessment are:

- Temperature: Predicted wind chill equivalent temperature of -32 degrees Celsius
- Work activities that could result in a cold stress emergency. E.g., Unexpected exposure to frigid conditions

There are also risk factors that will increase the degree of cold stress and likelihood of hypothermia, including:

- Poor physical fitness
- Not being used to working in the cold
- Having a cold or other flu like symptoms
- Chronic illness, especially heart disease, asthma/bronchitis, diabetes, mellitus, or chronic circulatory problems
- Drugs or medication such as alcohol, nicotine, caffeine can inhibit the body's response to the cold, or impair judgement
- Fatigue
- Vibration

PROPER USE OF CLOTHING

When working outdoors where there is the risk of exposure to hypothermia and cold-related injury, you are encouraged to wear adequate layers of clothing for optimal protection against the natural elements. Air captured between layers of clothing acts as an insulator, affording better heat conservation. These layers include:

Underlayer

This is the layer closet to the skin. Ideally this layer should consist of clothing made of a material that wicks moisture away from the body (such as polypropylene). Cotton is a poor choice for this layer as cotton tends to absorb and hold moisture, which can cause the body to lose heat.

Insulating Layer

This next layer serves to insulate the body and conserve body heat. There are many new materials available for use as an insulating layer, but wool is an excellent insulator and can conserve heat even when it is wet. A wool sweater serves well as the insulating layer for the upper body.

Outer Layer

This final layer provides a barrier to wind and moisture, as well as helping to conserve body heat. The best material for the outer shell is a breathable, water-proof material.

HYPOTHERMIA AND USE OF SHELTERS

If the Equivalent Chill Temperature is -7°C (19°F) or below, production will ensure that a heated shelter is located near the work area. You are encouraged to use these shelters at regular intervals depending on the equivalent chill temperature. A heated vehicle is acceptable as a heated shelter.

Workers entering the shelter should remove their outer layer of clothing and loosen other clothing to let perspiration evaporate. In some cases, a change of clothing may be necessary.

Workers exhibiting signs and symptoms of hypothermia or cold-related injuries need to be evaluated by a First Aid Attendant.

EATING AND DRINKING

High-caloric foods are important when working in cold environments. Warm, sweet drinks and soups help to maintain caloric intake and fluid volume. It is important to maintain an adequate fluid balance, as working in cold environments can result in excessive perspiration. Coffee should be discouraged because it increases water loss and blood flow to body extremities.

SAFE WORK PRACTICES

- Employ a “buddy system” to keep a regular watch on each other, including faces, cheeks, and ears for signs of frostnip, frostbite, and behavior for indications of impending hypothermia.
- Keep a regular “self-check” for cold areas, wet feet, numbness, or loss of sensation.
- If you discover a cold-related injury, stop work and re-warm the area of the injury.
- If there’s a risk of cold injury to the hands, a means of warming the hands must be available.

GENERAL TIPS FOR HYPOTHERMIA

- Remove the affected person from the cold environment and have assessed by a First Aid Attendant or by a physician, as soon as possible
- Always handle the affected person gently. Rough handling can cause heartbeat irregularities and death
- Hot fluids may be given only if the affected person is fully alert, without any signs of confusion. Moderate and severe hypothermic individuals have a high risk of vomiting and must not be given anything by mouth
- Take immediate measures to prevent further heat loss and continue to do so even if the affected person regains consciousness
- Remember that affected person may still be alive even if there is little or no pulse or heartbeat

Stages of Hypothermia		
Stage	**Core Temperature**	**Signs and Symptoms**
Mild Hypothermia	36°C-35°C (96.8°F-95°F)	• Feel chilled/cold sensation • Goose bumps • Unable to perform complex tasks with hands • Poor judgement, muddled thinking, and abnormal behavior • Bouts of Shivering • Hands may be numb
Moderate Hypothermia	35°C-32.2°C (95°-90°F)	• Violent shivering, or shivering has stopped altogether • Inability to think and pay attention (e.g. cannot understand what is being said) • Mild confusion although may appear alert • Slow, shallow breathing • Slurred speech • Poor body co-ordination (e.g. stumbling gait) • Slow, weak pulse
Severe Hypothermia	< 32.2°C (< 90°F)	• Shivering has stopped • Unconsciousness • Little or no breathing • Weak, irregular, or non-existent pulse • Dilated (wide open) pupils • Exposed skin blue and/or puffy • Possible similarity of symptoms to clinical definition of death