

Voisey's Bay: Thermal Stress Management Orientation

1. Thermal Stress Management Employee

1.1 Thermal Stress Management



Thermal Stress Management Employee Training (Winter)

VNL Labrador Operations



1.2 Untitled Slide



Agenda

- Employee Responsibilities
- Cold Stress
- Wind Chill
- Evaluation of Cold Stress
- Warm up Breaks

1.3 Employee Responsibilities

Employee Responsibilities

- Participate in monitoring programs to assess exposure to conditions that could cause cold stress.
- Consider thermal stress during the SLAM process.
- Self-monitor and monitor fellow workers for signs of heat or cold stress. Report to clinic if thermal stress identified.
- Adhere to all control measures or work procedures that have been implemented to reduce exposure to conditions that could cause cold stress.
- Inform Supervisor or Manager if signs or symptoms of a cold related disorder.
- Comply with the requirements of this program.



1.4 Cold Stress

Cold Stress

- Exposure to the cold can be hazardous or even life-threatening. Your body's extremities, such as the ears, nose, fingers and toes, lose heat the fastest. Exposed skin may freeze, causing frost nip or frostbite. In extreme conditions or after prolonged exposure to the cold, the body core can also lose heat, resulting in hypothermia.



1.5 Untitled Slide

Video Cold Stress



1.6 Evaluation of cold stress

Evaluation of cold stress

Wind Chill

Wind chill = temperature and wind velocity are important factors to evaluate when working outside. For example, when the actual air temperature of the wind is 0°C and its velocity is 40kph, the exposed skin would perceive these conditions as if the equivalent still air temperature was -7°C. A dangerous situation of rapid heat loss may arise for any person exposed to high winds and cold temperatures.



1.7 Untitled Slide

Evaluation of Cold Stress and Action to be Taken by Supervisors			
Supervisors are responsible for assessing tasks to determine if it is likely to pose cold stress risks.			
For exposed skin, continuous exposure should not be permitted when the air speed and temperature results in an equivalent chill temperature of -32°C . At air temperatures of 2°C or less, it is imperative that workers, who become immersed in water, or whose shoes or clothing become wet, are immediately provided a change of clothing and be treated for hypothermia. Hand protection is required to maintain manual dexterity for the prevention of accidents. Provisions for additional total body protection are required if work is performed in an environment at or below 4°C . Workers should wear winter apparel appropriate for the level of cold and physical activity.			
Wind Chill ($^{\circ}\text{C}$)	Exposure Risk	Health Concerns	Action by Supervisors
0 to -9	Low Risk	Slight increase in discomfort	<ul style="list-style-type: none"> Ensure workers consider temperature during the SLAM process. Ensure workers have the appropriate winter apparel. Plan work factoring the weather forecast to reflect the workload. Ensure workers stay dry Use buddy system
-10 to -27	Moderate Risk	Uncomfortable Risk of hypothermia and frostbite if outside for long periods without adequate protection.	<ul style="list-style-type: none"> As above Make shelter available for warm up breaks according to table 3 section 7.4 as a guide. Cover exposed skin
-28 to -39	High Risk: exposed skin can freeze in 10 to 30 minutes.	High risk of frost nip or frostbite. Check face and extremities for numbness or whiteness. High risk of hypothermia if outside for long periods without adequate clothing or shelter from wind and cold.	<ul style="list-style-type: none"> As above Consider rescheduling the work for completion on a more favorable day Provide shelter from climatic conditions. Schedule or alternate work areas for regular rest breaks using table 3 in section 7.4, as a guide. Use mechanical aids to reduce physical exertion.
-40 to -47	Very High risk: exposed skin can freeze in 5 to 10 minutes.	Very high risk of frostbite. Check face and extremities for numbness or whiteness. Very high risk of hypothermia if outside for long periods without adequate clothing or shelter from wind and cold.	<ul style="list-style-type: none"> As above



1.8 Untitled Slide

-48 to -54	Severe risk: exposed skin can freeze in 2 to 5 minutes	Severe risk of frostbite: Check face and extremities frequently for numbness or whiteness.	<ul style="list-style-type: none">• As above• Essential work only – JHA required
-55 and colder	Extreme risk: exposed skin can freeze in less than 2 minutes	DANGER! Outdoor conditions are hazardous.	<ul style="list-style-type: none">• As above• Essential work only – JHA required



1.9 Thermal Stress Management



Thermal Stress Management Employee Training (Summer)

VNL Labrador Operations



1.10 Untitled Slide

- Employee Responsibilities
- Heat Stress
- Symptoms of Heat Stress
- Evaluation of Heat Stress
- Humidex / Wet Bulb Globe Temperature (WBGT)
- Action Plan – Heat Stress

Agenda

1.11 Employee Responsibilities

Employee Responsibilities

- Participate in monitoring programs to assess exposure to conditions that could cause heat or cold stress.
- Consider thermal stress during the SLAM process.
- Self-monitor and monitor fellow workers for signs of heat stress. Report to clinic if thermal stress identified.
- Adhere to all control measures or work procedures that have been implemented to reduce exposure to conditions that could cause heat stress.
- Inform Supervisor or Manager if signs or symptoms of a heat related disorder.
- Comply with the requirements of this program.



1.12 Heat Stress

Heat Stress

- Heat Stress Video



1.13 Evaluation of heat stress – Methods used to assess Humidex & Wet Bulb Globe Temperature (WBGT)

Evaluation of heat stress – Methods used to assess Humidex & Wet Bulb Globe Temperature (WBGT)

- Humidex - provides a number that describes how hot people feel, much in the same way the equivalent chill temperature. Humidex is used as a measure of perceived heat that results from the combined effect of excessive humidity and high temperature.
- The WBGT measurement takes into account air temperature, air movement, radiant heat and humidity and can be related to the physical demands of the job. Because WBGT is only an index of the environment, the screening criteria are adjusted for the contributions of work demands and clothing. As work demands increase, the criteria values in the table decrease to ensure that most workers will not have a core body temperature above 38°C.
- The HSE Dept. will monitor environmental conditions regularly, and complete WBGT if the Humidex value exceeds or is expected to >30°C. In this case a hazard alert will be communicated.



1.14 Action Plan

Action Plan

Evaluation of Heat Stress and Action to be Taken by Supervisors			
Supervisors are responsible for assessing tasks to determine if it is likely to pose heat stress risks.			
The HSE Dept. will monitor environmental conditions daily, and complete WBGT if the Humidex value exceeds or is expected to >30°C. In this case a hazard alert will be communicated.			
Humidex Values	Exposure Risk	Health Concerns	Action by Supervisors (Refer to section 6 for additional controls)
< 29°C	Low Risk	No discomfort	<ul style="list-style-type: none"> Ensure workers consider temperature during the SLAM process. Plan work factoring weather conditions, task, physical requirements and required clothing. Encourage regular fluid intake. Use buddy system.
30-39°C (or air temp >25°C)	Moderate Risk	Some discomfort	<ul style="list-style-type: none"> As above HSE to communicate Heat Stress Risk Management Share. Observe for signs of heat stress Implement work rest breaks according to action levels/TLVs. WBGT monitoring by HSE Dept – results will be communicated and recommendations provided. Reschedule the work for completion on a more favorable day.
40-45°C	Moderate Risk	Great discomfort, avoid exertion	
>45°C	High Risk	Dangerous	<ul style="list-style-type: none"> As above Essential work only – JHA required
>54°C	High Risk	Heat stroke imminent	<ul style="list-style-type: none"> As above Essential work only – JHA required

