Climate Change

Climate Change: Extreme Weather - Cold

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Are we experiencing changes in cold weather patterns?

Climate change has led to an increase in extreme and variable weather. Although it is expected that Canadian winters, on average, will have milder temperatures in the future, extreme cold events are still predicted to occur. Potential impacts of the warming of the Arctic may include extremely cold polar air travelling further south, leading to more extreme cold events in Canada. It is also expected that all parts of Canada will see an increase in winter precipitation.

What are the impacts on worker health and safety?

Cold

The effects of extreme cold events include an increased risk of workers experiencing significant health issues such as hypothermia, frostbite, windburn, and heart and respiratory issues. Exposure to cold temperatures can also increase the risk of Raynaud's syndrome and musculoskeletal disorders.

For more information, please see our OSH Answers document on Cold Environments - Health Effects and First Aid.

Snow accumulation, ice, high winds, and melting snow

Snow accumulation, ice events, high winds, and melting snow can have impacts on worker health and safety, including:

- Poor driving conditions due to lack of visibility, and snow-covered or icy roads
- Increased risk of slips, trips and falls as a result of snow-covered walkways or icy surfaces
- Increased risk of flooding due to melting snow
- Injuries and incidents from falling snow and ice off outdoor elevated areas (e.g., roofs)
- Increased risks associated with high winds
- Power failures and equipment malfunctions

For more information on preparing for extreme winter weather, please see our OSH Answers document on Climate Change: Extreme Weather - Preparing for Climate Related Emergencies.

Mental Health

Cold temperatures may cause elevated levels of stress. For example, outdoor workers may experience stress when they need to change their schedules and hours due to the weather, which can impact their work-life balance. Many workplaces may experience disruptions and delays with operations, which can also impact workload and cause worker stress.

Operational Impacts

Equipment and materials, especially those items used outside, can be impacted by colder temperatures. Cold temperatures can cause equipment components to not function properly, to work harder, and possibly wear out faster. For example, the controls may be frozen and not allow for the safe operation of the equipment. In cold weather, batteries do not operate as efficiently, which can also lead to not being able to start or maintain the power of the equipment. Extreme cold, heavy snowfall, high winds, and ice can also delay and disrupt operations.

How can a workplace plan for extreme cold?

The onset of extreme weather can occur very quickly in the winter, and workplaces need to be prepared. Control measures for working in the cold must be implemented to protect workers during variable Canadian winter weather. First, identify all the potential hazards associated with extreme cold and winter weather at your workplace that could lead to an injury, illness, or incident. The hazards should then be assessed based on both the probability and severity that a worker will be harmed or become ill. Appropriate control measures can then be implemented to eliminate the hazards or to reduce the risk of the hazards. After the controls have been implemented, they should be evaluated to make sure they are effective and are working as intended.

It is important to note that emergency service providers, including paramedics and firefighters, may need more time to respond due to the weather and the increased demand for their services in the community. If a worker requires immediate medical attention (e.g., due to hypothermia, a slip, trip, or fall, or a motor vehicle collision), emergency services may be delayed or unable to respond in time. This competing demand for services further emphasizes the importance for workplaces to have preventative measures in place.

Additional circumstances that can increase the risk of an injury, illness, or incident during extreme cold events include:

- working outdoors
- working in poorly heated areas
- performing physically demanding work in cold temperatures
- not having access to a heated sheltered area to rest and take breaks
- driving vehicles or other equipment outdoors

Extreme cold can put everyone at risk, although health risks are greater for:

- people with chronic illnesses, such as breathing difficulties or heart conditions
- people that are pregnant
- young children and older adults

What control measures can the employer put in place?

Prepare for extreme cold and winter weather by developing and implementing a cold stress plan and an emergency response plan. The most effective strategies to protect workers are to implement measures that eliminate or minimize a worker's exposure to extreme cold and winter weather. The hierarchy of controls can be used to select the most appropriate control measures.

The hierarchy of controls is a step-by-step approach to eliminating or reducing the risk of workplace hazards. The hierarchy of controls prioritizes controls from the most effective level of protection to the least effective level of protection: elimination, substitution, engineering controls, administrative controls, and personal protective equipment.

The following control measures will help workplaces address extreme cold :

Elimination

Where possible,

- Avoid physically demanding work in extreme cold

- Do not allow driving or travelling during extreme winter events
- Have workers perform their work in a heat-controlled environment
- Reschedule work performed outdoors when temperatures are milder

Engineering Controls

- Improve heating in work areas*
- Provide heated shelters for rest and breaks*
- Using tools and equipment that are designed so they can be safely operated while wearing gloves or other winter clothing
- Maintain work vehicles and have snow tires and functioning heaters

*Do not use unvented portable gas heaters in indoor settings as it can lead to harmful levels of carbon monoxide and other harmful combustion products and is a fire hazard.

Administrative controls

- Use weather surveillance procedures to identify upcoming cold events and to detect the sudden onset of cold events
- Have emergency plans and procedures in place to respond to extreme cold events
- Train workers on:
    - how to identify health effects of cold stress in themselves and others, how to respond, and first-aid procedures
    - what to do in the event of an emergency caused by extreme cold and winter weather
    - the pace of work to avoid overheating (sweating) and then cooling
    - appropriate use of winter weather clothing and personal protective equipment (PPE) for working in the cold

Personal Protective Equipment (PPE)

Provide workers with the appropriate personal protective equipment (PPE) and clothing for working in the cold. Take into account the temperature, weather conditions (e.g., snow, ice, wind speed, wind chill), the level and duration of the activity being performed, and the job design. Also, make sure workers are equipped with emergency supplies and equipment, especially if they are offsite or are travelling.

For more information, please see the OSH Answers documents Temperature Conditions - Cold and Cold Environments - Working in the Cold.

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