Workplan: 7-Step Cold Stress Workplan

Working in cold temperatures, whether indoors or outdoors, presents a unique set of hazards. Wind, snow, rain, cold surfaces, and other elements can compound the hazards. Help your supervisors and your workers avoid injury, amputation of fingers and toes, and death from exposure by implementing a Cold Stress Workplan. Here's how to get started.

Step 1: Conduct Cold Stress Assessment

The first step is to perform a cold stress hazard assessment. To identify cold stress hazards, you need to understand the human body functions normally when it has a "core" temperature of 98.6° F/38° C. Although 1° or 2° doesn't generally make a big difference, if the core temperature drops too low it can lead to problems such as:

- Hypothermia, i.e., when the body loses heat faster than it can replenish causing body temperature to drop to 95°F /35°C or lower, which can cause death in extreme cases;
- Frostbite, i.e., actual freezing of the skin which can lead to amputation; and
- Trench foot, i.e., freezing of the foot caused by immersion in cold water or prolonged exposure to extremely cold air.

Step 2: Measure Cold Stress Exposure

The next step is to figure out if the environmental conditions of the workplace create cold stress dangers. Degree of exposure to cold stress is based not on comfort but what's called thermal comfort, or how the air actually feels to the worker since it's how the air feels that determines the impact on core body temperature. Seven risk factors to consider:

1. **Temperature**: Consider not just ambient temperature as shown by the thermometer but how the air actually feels to the worker. Rule of thumb: If temperatures drop below 30° F/-1°

C, you have a potential problem.
2. **Wet and Damp Conditions**: Wetness chills the body and increases the risk of cold stress.
3. **Wind and Wind Chill**: The faster the wind, the colder a worker will feel. The combined effect of cold air and wind speed is called “equivalent chill temperature” (ECT) or “wind chill,” or the temperature the body actually feels.
4. **Contact with Cold Surfaces or Water**: Being in contact with something cold chills the body and increases a worker’s risk of cold stress.
5. **Workers’ Physical Condition**: Consider the age, weight, fitness and acclimatization, i.e., whether workers are used to working in cold conditions.
6. **Movement and Exertion**: Moving around and doing intense physical work warms the body while standing around allows the thermal conditions to drop body temperature more easily.
7. **Clothing**: Clothing can insulate the body, helping it maintain body temperature and ward off cold stress.

Step 3: Keep Exposure to Cold at Safe Levels

To determine safe limits for exposure to cold stress you may have to rely on non-government agencies because specific regulations from government safety agencies don’t exist across the board. Many Canadian territories and the U.S. (OSHA), use Threshold Limit Values (TLVs), a measurement created by the American Conference of Governmental Industrial Hygienists (ACGIH) to define the maximum exposure limits for cold stress. The ACGIH has created a Work/Warm-Up Schedule that you can reference.

To keep workers safe throughout the day you must continue to monitor temperature and wind chill levels to ensure thermal conditions are within safe levels.

Step 4: Implement Engineering Controls

The ideal method of protecting workers from cold stress is to adopt engineering controls that eliminate or reduce the hazard. In the context of cold stress, these controls involve using methods to change the environment to ensure exposure is kept at safe TLVs

including:

- Heating systems to warm the air.
- Space heaters to warm sections of the workplace.
- Heated trailers or other warming stations where workers can take breaks to warm up.

Step 5: Implement Safe Work Practices and Work Controls

When cold stress hazards can’t be eliminated or engineered away, the control is to change how the work is done – to make it safer. Safe work practices and work controls include:

- Acclimatizing, or gradually getting workers used to working in the cold.
- Scheduling cold outdoor work for the warmest hours of the day.
- Giving workers lots of breaks so they can drink warm sweet drinks and soups.
- Training workers how to recognize and respond to different kinds of cold stress.
- Having appropriate first aid personnel, facilities and equipment.

Step 6: Require PPE Use

When there is still a hazard exposure, you must provide and require workers to wear PPE. Ideally, PPE will be used in combination with the other controls. For cold stress, this would include dressing in layers and wearing:

- Insulation under the outer layers of clothes.
- Hats or hard hats to cover the head and ears.
- Waterproof outer layers when working in wet conditions.
- Warm socks and warm shoes.

Step 7: Provide Training

Finally, you must provide training to exposed workers. A proper cold stress training program must include:

- Knowledge of cold stress hazards.

- Recognition of predisposing factors, danger signs and symptoms.
- Awareness of first-aid procedures for, and the potential health effects of, different forms of cold stress.
- Workers’ responsibilities in avoiding cold stress.
- Dangers of using drugs, including therapeutic ones, and alcohol in cold work environments.
- Use of protective clothing and equipment.
- Purpose and coverage of any environmental and medical surveillance programs and why workers should participate in them.

