Appendix BB

Working in freezers and cold storage facilities

This safety program are guidelines to prevent injury and illness associated with extreme cold temperatures while working in freezers and cold storage facilities. These preventions and procedures will need to be included with job site conditions and scope of work hazards specific to each project when planning.

On-site evaluations and pre-planning must be completed by a member of the VSC district management team to complete a Job Hazard Analysis.

Hazard assessment

Potential effects from exposure to extreme cold temperatures

- **Hypothermia** is a medical emergency that occurs when your body loses heat faster than it can produce heat, causing a dangerously low body temperature. Normal body temperature is around 98.6 F (37 C). Hypothermia (hi-poe-THUR-me-uh) occurs as your body temperature falls below 95 F (35 C).
- **Frost Bite** is injury to body tissues caused by exposure to extreme cold, typically affecting the nose, fingers, or toes and sometimes resulting in gangrene.
- **Other effects-** when the body is exposed to cold temperatures, the negative effects can include dehydration, numbness, shivering and fatigue. These negative effects are experienced first by the peripheral parts of the body and gradually progress to deep body tissues and the body core.

These can also affect an employee's ability to handle equipment & material possibly dropping items from overhead.

Duration of exposure- Time or duration of exposure can be limited to 20 minutes or can work up to one hour before a break is required with the current PPE freezer gear. (per Individual tolerance for conditions)

Number of employees inside the freezer- At a minimum two people must be in the freezer. This will decrease the chances of developing symptoms of hypothermia by having employees monitor each other.

Emergency response-

- The VSC supervisor must find out if the facility has an indoor heated area or room where employees can recover and take their breaks.
- Both employees must exit the freezer if one of them feel the need to take a break to recover.
- For projects requiring several hours to complete a third person (attendant) must be posted outside to call for help if needed. Employees could also rotate as attendant.
- Establish 911 or local emergency response personnel.
- If Aerial lift equipment is used establish an emergency retrieval to get workers down from MEWP incase the hydraulic system of the equipment shuts down due to extreme cold.
- Contact the equipment rental company to request lift equipment that is modified for extreme cold temperatures if available.

- If any employee develops symptom of hypothermia or other conditions work will stop and the Safety Management will be contacted immediately. Re-entry will not be allowed until an assessment is completed and any needed change to the JHA or emergency response has been done.
- Follow emergency response, treatment and prevention.

Pre-planning-

- A VSC District management team member will visit the site to evaluate and gather more information to finalize plan that may need to be added to this guideline.
- Document training employees in symptoms of hypothermia, treatment and prevention using this program and frost bite & cold weather safety alerts.
- Complete a JHA. contact VSC Safety Management for assistance if needed.
- Purchase PPE and gloves that will allow employees the mobility to perform tasks.
- Have first aid treatment aids on site.
- Establish emergency response procedures.

Ammonia processes:

If the refrigerant of freezer or cold storage is supplied by an Ammonia processing system and employees will be exposed to these facilities the VSC Ammonia Safety policy Appendix U must be implemented. Employees must complete Ammonia Awareness training. Contact VSC Safety Management for assistance.

Request owner to move product and shelving or do so under owner supervision or authorization

mechanical space above freezers maybe an interstitial space that can be a confined space. If so, refer to **VSC Appendix L. Confined Space policy** prior to entry.

Large cold stroage warehouses may use ammonia process. Refer to **VSC Appendix U Ammonia awareness policy for safe work procedures and JHA in freezers & cold storage failities** .

Use spotter as necessary when working near material handling equipment.

Service and inspection of fire protection requiring implementing water loss prevention measures. see **VSC Water Loss Prevention Policy.**

Constant, unrelenting cold is not only uncomfortable, but it can also pose a serious hazard to your health. You must be aware of the impact the cold has on your body and internal systems to stay safe in your job in cold storage. This policy covers:

How the human body responds to the cold

The dangers that surround working in Cold Storage

How to stay safe in Cold Storage

How the body responds to the cold

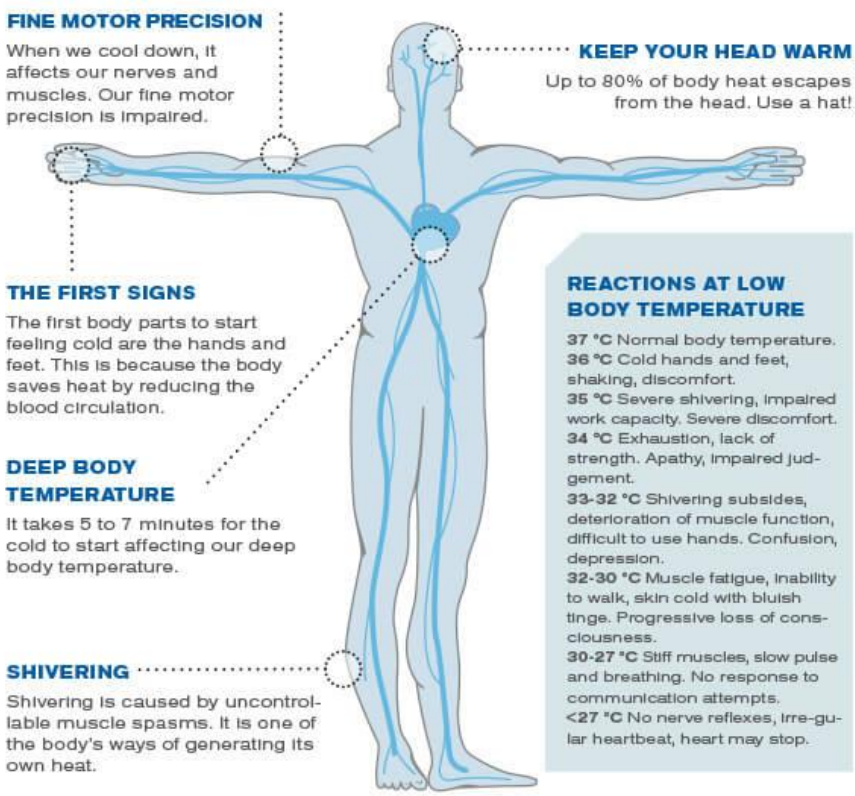
A summary of the impact of the cold on the body

When the human body is exposed to the cold, it responds in two ways to reduce heat loss:

By constricting the blood vessels in the skin and extremities (fingers/toes) to keep your core as warm as possible.

By increasing the metabolic heat product rate, either by physical work you are doing, or by shivering. Shivering is an indifferent way of increasing your heat production though, as it increases oxygen consumption and reduces your effectiveness.

As your body responds in these ways, it is using more energy than it would in ambient temperatures. Hence, it is burning food and drink faster and will tire faster. More on this later!



Impact of the cold on your work performance

These initial impacts can lead to you becoming uncomfortable and can reduce your effectiveness on the job. You may lose dexterity and sensitivity in your hands as they become numb, meaning you will struggle to complete tasks such as using an RF scanner. Accidents increase in a cold environment because your performance is not at its peak, meaning you may lose concentration or tire faster.

The serious risks of working in cold environments

If you stay in cold environments for extended periods of time and/or are not wearing suitable protective clothing, your body may be at risk of more serious implications. These can include:

Frostbite. This is where the fluids in the body tissues freeze, causing permanent damage to the skin. Body parts at the most risk to this are the extremities, fingers, toes, the nose and the ear lobes.

Hypothermia. This is where your body temperature decreases significantly (below 35°C) and can ultimately (and quickly) lead to death. Early symptoms include confused though processes, loss of general motor control, slurred speech, aggressive shivering and a perception the victim feels hot. Hypothermia is rare in cold storage however and can be avoided through protective clothing that is adequate, and importantly, not damp or wet.

Long term conditions. Conditions such as arthritis, rheumatism and bronchitis are commonly associated with the cold and may only come out years after working in the cold. Muscle and tissue damage can also occur.

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Other dangers you should consider:

Cold Stores and Warehouses often have poor ventilation, which presents a hazard. Any gases or contaminants, such as LPG or fumes from forklifts, will not easily escape and could be dangerous for those working in the room. Another thing to consider is ammonia is often used for refrigeration which can be deadly, should there be a leak on site. If you are worried about any irritating smells inside the cold store you should report them quickly to your supervisor.

Another area to focus on is door openings between different areas. Because of the changes in temperatures or conditions, ice/water/condensation can build up in these areas, making them extremely slippery and danger

How to stay safe working in cold storage

1. Take warm up breaks

VSC employees will take a break every 20 minutes to get out of the freezer and make yourself a warm drink and snack! Ensure you choose a nutritious and energy-rich snack like fruit or muesli bars, rather than just what you 'feel like' (potato chips, sweets, cookies etc).

Make sure you take these warmup breaks, even if you aren't feeling cold at the time, as it is vital to keep your body temperature at a moderate level. Keep your jacket and/or trousers on during the break to boost your body temperature.

2. Wear suitable protective clothing and PPE

Choosing suitable Cold Store Clothing

Choosing protective clothing that suits the environment and job role you are working in is vital in keeping safe in a cold storage environment. Finding the biggest, warmest jacket you can find is NOT always the best option. Here are some best practices in choosing the right jacket and trousers:

Depending on the amount of physical activity involved in your job role, you may sweat in your freezer gear! It may sound crazy, considering the environment is probably -20°C, but if your freezer wear is too warm you will sweat, making you damp and cold and at risk of cold injury

Wear multiple layers of clothing, rather than a single, heavy jacket. The air between each layer will provide better insulation and warmth, plus it gives you the option to open or remove a layer to avoid excessive sweating. It is important the inner layer is a material that 'wicks' moisture away from your skin, such as wool, polypropylene or polyesters. Avoid cotton, which will absorb the moisture and leave you damp and cold. Read more about layering in this article.

Dry your freezer wear each night after work to ensure it maintains its insulating properties.

Keep your freezer wear clean! Dirt or dust will fill up air cells in the clothing, meaning it will lose its insulating properties. If you company doesn't wash your freezer wear, do it yourself! Ensure you purchase freezer wear that washes well, as some brands deteriorate after a couple of washes and get colder

Choosing suitable Cold Store Footwear

There are safety boots specifically designed for work in cold storage available on the market. You may or may not be provided with these by your company, but it's well worth getting a pair yourself if they don't.

Freezer boots with leather uppers are recommended, as it is porous, meaning your feet will be able to breathe and will sweat less. Boots with Thinsulate® lining such as the Gator are great and will keep your feet warm. If you're working in a freezer, a boot with at least 500g of Thinsulate® is recommended.

Cold stores and freezers are often slippery places because of the ice and precipitation that builds up. Ensure the boots you get have a slip resistant sole; an SRC rating is recommended!

The type of socks you choose is also an important consideration. As we've mentioned already, don't use cotton ones as they will absorb moisture and leave your feet damp and cold. Polypropylene versions are best for insulation. In terms of which thickness you choose, ensure they aren't too tight inside your boots, as this reduces their insulating properties and may slow the blood flow in your feet, posing the risk of cold injury.

Choosing suitable Cold Store Headwear

There is a myth that you lose the most body heat out of your head, which isn't correct. However, it is certainly important to keep your core and head warm, so invest in a decent beanie or balaclava. These are both available with insulation, which makes them breathable and warm. If you require eye protection as well, ensure they are separate from the nose and mouth to prevent the eye shields fogging up.

Choosing suitable Cold Store Gloves

As we've already alluded to, your hands are one of the extremities that get very cold, very quickly in a cold store. You must ensure you are always wearing thermal gloves in the freezer to keep your hands insulated and to provide a layer of protection between you and any cold steel or equipment, which can damage your skin.

Thermal gloves are a very personal PPE item – you may hate the gloves that your colleague loves! Plus, your job role may require a certain amount of hand dexterity which can be hard to achieve wearing warm, but bulky, freezer gloves. For this

reason, we suggest you get in touch with a cold store PPE expert to receive their recommendations of which gloves will be warm and dexterous enough to keep your hands warm without hampering your performance.

Contact VSC Safety Management for assistance in getting protective clothing.

3. Maintain a healthy and balanced diet

A balanced diet and adequate liquid intake are essential to keep safe and productive in the freezer. As we've discussed already, when you are working in a cold environment you are using extra energy because the body is working to keep itself warm. The measures it takes to regulate body temperature, such as shivering, burns energy and dehydrates your body. In addition, freezer clothing, boots and PPE are sometimes bulkier than general clothing and will require more energy to move around in. To stay energized and hydrated:

Eat a decent, balanced diet containing protein, carbs and natural fats and sugars to help fuel your body and maintain your performance. Avoid too much 'comfort' food that don't offer any nutritional value, such as potato chips, meat pies etc.

Drink plenty of fluids around and during your shift. Sports drinks such as Powerade contain electrolytes which will fuel your body and help keep your hydrated.

Avoid drinks with caffeine in, such as energy drinks. Soda, and coffee as they increase urine production, thus contributing to dehydration. They also increase the blood flow at the skin surface which can increase the loss of body heat.

Avoid caffeine rich energy drinks

In summary.

Pre-plan

Take warm up breaks every 20 minutes as needed and can work up to one hour before a break is required with the current PPE freezer gear. (per Individual tolerance for conditions)

Wear suitable protective clothing and PPE and,

Maintain a healthy and balanced diet.

Extreme cold Temperature Management Rescue Plan:

1. **Emergency contacts and communication**
   - On-site emergency contacts, local medical services, nearby hospitals all including numbers and addresses.
   - Ensure effective communication tools are available such as radios, phones, intercom systems, etc.
2. **Incident Assessment and Immediate Response**
   - Report sign and symptoms of cold-related illness and injury to supervisor, on-site management (contractor) and medical staff immediately.
   - Carry extra cold weather gear, such as change of clothing in case work clothing gets wet.
   - Medical, environmental thermometer, and chemical hot pack **MUST** be included inside first-aid kit.
   - A designated and trained personnel shall perform initial assessments and provide immediate assistance to affected employees.
3. **First-Aid and Emergency Supplies**
   - First-aid kits shall be accessible (VSC employees bring on-site) and stocked with supplies included (not limited to) thermal blankets, hand warmers, heated, gloves, and a change of clothing.
   - If more emergency supplies are needed, please do not hesitate to reach out to your Regional Safety Manager, Division Manager, Superintendent, or Foreman.
4. **Evacuation Procedures**
   - Ensure all exits are clearly marked and no blockage is present in front or behind doors.
   - Assembly point must be a warm area where all employees can gather and await to receive further instructions.
   - Emergency evacuation for release of Ammonia Gas or liquid. Customers or facility emergency Ammonia response plan must be reviewed by supervisor and crew prior to any work. Site specific training may be required of customer. Rescue Contact information must be established.
5. **Medical Response and First-Aid Training**
   - Employees working in cold climate environments MUST be trained on providing first-aid for cold-related conditions, such as hypothermia and frostbite.
   - During the emergency transport (if one is needed) ensure vehicles and equipment are ready to transport injured employees to medical facilities.
6. **Follow-Up**
   - Post incident, medical and psychological support will be provided to affected employee by cold-related incidents.
   - Management will conduct post-incident reviews to identify causes and implement measures to prevent future occurrences.
7. **Continuous Improvement**
   - After each extreme temperature assignment, feedback shall be given by the employee(s) on the effectiveness of the policy and rescue plan.
   - Before conducting extreme temperature assignment, a rescue drill should take place in case of emergency during the job.

Handouts for training:

https://www.cdc.gov/niosh/docs/wp-solutions/2019-113/pdfs/2019-113.pdf?id=10.26616/NIOSHPUB2019113

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