



INTRODUCTION

We live and work in different environments from desert heat to arctic cold and every condition in between depending on the season. With extreme cold, as with extreme heat comes hazards that should be addressed in order to protect personnel when working in these environments.

Actual Near Miss

During routine work on the deck in extreme cold temperatures, several crew members were spotted working in torn cold weather coveralls and no parkas thereby exposing their extremities to the cold. The crew members were immediately stopped and instructed to change into proper cold weather PPE and coveralls. The crew members were also alerted to the dangers of performing work in extremely cold temperatures without the proper PPE.

Cold Weather Hazards

Proper care should be taken during cold weather conditions. Personnel may find the ground more slippery due to iced over water puddles or snow on the deck. It is extremely important to use appropriate footwear to protect against slips and falls. Additionally, individuals should always walk with caution. If pathways are not equipped with railings, temporary rails may be put in place to assist personnel while walking on weather decks and open areas. In addition to injuries resulting from slips and falls during cold weather, personnel may fall prey to cold weather stress. Cold stress develops from the body's inability to warm itself or regulate to the core temperature of 37°C (98.6°F). Cold stress can lead to tissue damage and even death in extreme cases. Four factors that contribute to cold stress are as follows.



- Air temperature
- High velocity air movement
- Humidity level in the air
- Contact with cold water or surfaces

As the cold temperatures draw heat away from the body, inadequate protection leads to cold stress conditions. There are three main conditions resulting from cold weather stress: trench foot, frostbite, and hypothermia. Information pertaining to these conditions and what can be done to prevent them is provided below.

Trench foot

Trench foot is caused by the immersion of feet in cold water at temperatures above freezing for long periods of time or by excessive sweating of the feet. Trench foot does not require freezing temperatures; it can occur in temperatures up to 16°C (60°F). Symptoms of trench foot include tingling, itching or a burning sensation. Advanced trench foot can lead to blisters, open sores, and if left





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untreated, can develop into gangrene which can result in amputation. Trench foot can be prevented by keeping the feet warm and dry. It is recommended that personnel change their socks frequently.

Frostbite

Frostbite occurs when the skin literally freezes and loses water. It generally affects the extremities and severe cases can result in amputation. Areas affected by frostbite exhibit the following symptoms: cold, tingling, stinging, aching and numbness. The skin in the affected areas turns red, then purple, then white and is generally cold to the touch; severe cases may produce blisters. Frostbite should be treated by moving to a warmer place and removing any constricting items and wet clothing. The affected area should be wrapped in sterile dressings and medical attention should be sought. Frostbite can be prevented by keeping gloves and socks dry, as well as using protective creams for the face and wrists to preserve the body's natural oils.

Hypothermia

Hypothermia occurs when body heat is lost faster than it can be replaced. This causes the body to dip below its core temperature to around 35°C (95°F) where symptoms generally begin. The individual begins to shiver to replace heat loss. If unsuccessful they may experience loss of coordination, slurred speech, impaired hand functionality and pale and cold skin. When the body temperature falls below 32°C (90°F) the condition can become critical and eventually fatal. If symptoms of hypothermia are observed, the sufferer should immediately be moved into a warm environment, changed into dry clothing, wrapped in warm blankets and provided with warm drinks. Medical care should be sought and the individual kept awake if possible. In order to prevent hypothermia, individuals working in extreme cold environments should take frequent breaks in warm areas with warm drinks and snacks.

Cold Weather Safety Precautions

To prevent injury and illness due to cold weather safety precautions should be taken. Some examples are provided below.

- Wear weather appropriate PPE
- Wear several layers of clothing rather than one thick layer
- Hands and head should be covered at all times to minimize heat loss and wear scarf or facemask to protect the face in cold or windy weather
- Wear synthetic or cotton clothing next to the skin to draw off sweat
- Wear warm footwear with one or two pairs of warm socks, without restricting blood flow to the feet
- Take frequent short breaks in a warm shelter. As a reference every 15 to 20 minutes
- Avoid working in cold environments when fatigued; working in the cold requires more energy
- Avoid alcoholic or extremely sweet beverages
- Position skid-resistant door mats near entrances to dry off footwear
- Keep pathways clear of snow and ice; keep them well-illuminated and equipped with means to assist during walking (e.g. railings or lifelines)
- Be careful when climbing ladders or stairs; ice may form on the treads or rungs
- Wear slip-resistant footwear, appropriate for the weather; shoes not containing rubber soles are extremely hazardous in cold weather
- Consume warm, high-calorie food to generate the increased energy need in cold environments
- Always keep a set of fresh, dry clothes available in case clothing becomes wet



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Actual Injury Report

An employee was performing basic maintenance aboard a crane barge during unusually cold weather. The employee slipped and fell onto the ice-covered deck while walking which resulted in a broken leg. Afterwards the company immediately applied salt in order to de-ice the deck. Employees should use caution when working on icy or slippery surfaces and slow deliberate steps should be taken when working outside in cold environments.

Discussion

- Report and discuss any incidents pertaining to cold weather hazards with your supervisor.

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