Temperature Extremes & the Workplace

CWA members are employed in environments, both inside and outside, which may involve exposure to cold and hot temperatures. This fact sheet will focus upon working conditions and related health effects encountered among workers who perform their work outdoors. Working in cold or hot temperatures may lead to an increase in accidents, illnesses, job stress, job dissatisfaction, and a decrease in productivity. To ensure that CWA members are employed in safe and healthful workplaces, the reduction and control of temperature extremes should be of primary concern to employers with which the Union has a collective bargaining relationship.
CWA members employed as cable splicers, installers, service and outside plant technicians, traffic agents, broadcasting workers, and other jobs involving outside work are routinely exposed and likely to suffer potentially hazardous exposures to cold and hot temperatures.

Working in Cold, Outside Environments

Because humans are warm-blooded, the body maintains a fairly constant temperature. The human body burns fuel and manufactures heat to keep temperatures within safe limits. Exposure to cold temperatures may cause the body's internal temperatures to fall below safe limits. This occurs when the body loses heat faster than it can produce it. The body's heat loss will also be affected by such factors as the amount of moisture in the air (humidity), the amount of wind, and the type of clothing that is worn.

As the body loses heat, blood vessels in the skin constrict to conserve internal heat. Thus, in cold environments, a worker's hands and feet are affected first. Cold and numb hands and feet are the first signs that the body is reacting to conserve heat. If the body continues to lose heat, involuntary shivers may occur. Involuntary shivers are both the body's way of attempting to produce heat and the first warning of hypothermia, or decreased body temperature. Additional heat loss may cause the brain to become less efficient, produce speech difficulty, forgetfulness, disorientation, loss of manual dexterity, collapse, and, possibly, death.

Controlling the Hazard

The preferred method of protecting workers from cold environments is through the implementation of engineering controls such as enclosures and adequate heating systems. However, for many CWA members exposed to extremely cold outside temperatures, engineering controls may not be either feasible or practical. Under these conditions, employers must provide proper personal protective equipment. Properly fitted, multi-layered clothing with an outer shell of windproof material is recommended. Clothing should be made of low-density resilient materials such as quilted fibers, pile, or loosely woven wool or synthetics. Such clothing will allow perspiration to evaporate, while keeping the body warm. If one's clothing becomes wet, it should be changed. Wet clothing will cause the body to lose heat quickly, because evaporating water takes up a lot of heat.

Frequent rest breaks are also important. In cold, winter conditions, a warm shed or van should be available so that workers can warm up and allow their body temperatures to recover from the cold.

Workers exposed to cold environments may notice their skin beginning to sting or tingle. If this occurs, the skin should be rubbed to stimulate circulation. However, in cases where the body becomes numb, the skin should not be rubbed. Rather the affected body parts should be immersed in warm water or warmed by other suitable means.

If a CWA member is stranded in a vehicle during a storm, she/he should stay in the vehicle. The engine will furnish heat, while the vehicle acts as a shelter from outside elements. Particular caution should be taken to prevent buildup of carbon monoxide from the engine. The motor should be run sparingly, and for adequate ventilation, the downwind window opened. To stimulate circulation, arms and legs should be moved vigorously. For additional warmth, in an extreme emergency insulation from the vehicle's seats may be taken and stuffed in one's clothing. Employers should ensure that vehicles are well maintained, in proper working condition, and are well stocked with emergency supplies.

Working in Hot Outside Environments

Just as cold temperatures can adversely affect the body, so can work in hot environments. To keep internal temperatures within safe limits, the body must get rid of excess heat when the air temperature is high and/or the physical workload is very heavy. This is achieved primarily through the varying rate and depth of blood circulation and the evaporation of sweat from the skin. As the heart begins to pump more blood, blood vessels expand to accommodate the increased flow, the blood circulates to the surface of the skin, and excess heat is lost into the cooler atmosphere. (The evaporation of sweat is the most important way to lose body heat).

As air temperatures approach normal skin temperature, the body has a harder time cooling itself. Periods of high humidity make the problem worse. Under these conditions, hard physical work becomes more difficult to perform. In turn, work in such an environment may lead to an increase in worker accidents, illnesses, and fatalities, as well as a decrease in the affected worker's health, efficiency, and performance capacities.

Within limits, one's body will normally and naturally become more adjusted to the hot work environment. This adjustment, or acclimatization, develops after about a week of work under the hot conditions. Once adapted, the amount of strain upon the body is reduced. A worker who has become acclimatized will have a lower heart rate, lower body temperature, higher sweat rate, and, therefore, have more stamina for work in hot environments.

The direct effects of work in hot environments may result in heat stress and several illnesses ranging from heat rash to heat stroke. Heat stress is the sum of environmental and physical work factors that equal the total heat load placed on the body. These factors include the source of heat, the level of work, the acclimatization of the worker, and atmospheric conditions (humidity, wind, and air temperature).

Heat-related disorders or illnesses that may be caused by work in hot environments include heat rash, heat cramps, heat exhaustion, and heat stroke.

Heat Rash

Heat rash, commonly referred to as "prickly heat," may develop when one's sweat is not easily removed from the skin's surface by evaporation. Sweat ducts become blocked and sweat glands inflamed, resulting in a skin rash. Heat rash, an extremely uncomfortable condition, can be prevented by taking periodic breaks and through proper personal hygiene.

Heat Cramps

Heat cramps are painful, intermittent muscle spasms that occur during or following hard physical work under hot conditions. The muscle spasms are the result of an excessive loss of salt in sweat without adequate replacement. Spasms may develop even though there may be adequate water replacement. Those muscles used in performing the work are usually affected. Heat cramps may occur during or after work. An effective method of prevention is drinking salted liquids or eating salted food. Workers with heart problems or on a low sodium diet should notify their employer or supervisor of their medical condition. In addition, employees with such medical conditions should consult a physician.

Heat Exhaustion

Heat exhaustion is caused by the loss of body fluids through sweating, the loss of salt, or both. This condition is characterized by profuse sweating, giddiness, weakness or fatigue, headaches, nausea, rapid weak pulse, fainting, and, in more serious cases, by vomiting and loss of consciousness. Workers suffering from heat exhaustion will have cool, moist skin and a pale, flushed complexion with a normal or slightly higher than normal temperature. A person suffering heat exhaustion should rest in a cool location and drink plenty of liquids. Mild cases may result in spontaneous recovery with such treatment. Severe cases may require medical care for several days. Workers with heart problems or on a low sodium diet should inform their employer or supervisor of their medical condition. Also, such employees should consult a physician before working in hot environments.

Heat Stroke

Heat stroke is the most serious illness associated with work in hot environments. Heat stroke occurs when the body's heat regulation mechanisms break down. The characteristics of heat stroke are a high body temperature (105 degrees Fahrenheit (F) or more), little or no sweating, and hot, dry, flushed skin. In addition, workers suffering heat stroke may become delirious, confused, convulsive, or comatose. Heat stroke can often be fatal.

If it is felt that a worker is suffering from heat stroke, immediate medical treatment is necessary. Immediate steps should be taken to lower the victim's body temperature. This can be done by moving the individual to a cool area, soaking the worker's clothes with water, and fanning the body. If possible, the individual should be put into or immersed in ice and wrapped in cold, wet sheets. Following treatment at the workplace, the victim should be taken to a hospital or similar medical facility. Since severe heat stroke may result in brain damage, early recognition and treatment are essential.

Controlling the Hazard

For outdoor work, administrative controls are the best methods of protection. Because heat stress is dependent upon the amount of heat the body produces while performing a job, reducing the amount of physical work required or the length or duration of work time will reduce the potential for heat stress. Provision of periodic rest breaks is a must. Rest breaks will allow the body time to rid itself of excess heat, reduce the production of internal body heat, and provide greater blood circulation to the skin. Employers should evenly distribute the work throughout the shift by breaking up long periods of work into shorter work-rest cycles. Where possible, the most strenuous work should be performed during the work-rest cycles. Use of administrative work practices are especially important during conditions of extreme heat and high humidity.

Administrative controls should be supplemented with appropriate clothing. In strong sunlight, loose clothing shading the skin, but allowing air circulation should be provided. In low humidity and strong sunlight, less clothing is needed, but care should be taken to prevent sunburn.

Employees should also be provided with adequate supplies of liquids to replace lost body fluids. Replacement fluids should be about 40 degrees F, or cool enough to be acceptable to workers' tastes. Consumption of alcoholic beverages is not advised since alcohol may cause additional dehydration.

CWA members who work in environments in which temperature extremes occur should be provided employer-sponsored training regarding the previously mentioned safety and health concerns. Educational sessions and materials should deal with the various degrees of heat stress, adaptation to hot environments, and control techniques.

At the present time, there is no OSHA standard for temperature extremes. However, the National Institute for Occupational Safety and Health (NIOSH) has developed recommended practices for work in cold and hot environments. For more information, interested members might refer to:

Criteria for a Recommended Standard: Occupational Exposure to Hot Environments, (NIOSH); and

The Industrial Environment: Its Evaluation and Control, (NIOSH); "Control of Exposures to Heat and Cold," Harwood Belding, Ph.D., and "Physiology of Heat Stress," David Minard, Ph.D., M.D.