HEAT ILLNESS PREVENTION PROGRAM

MEEK'S, HOMEWOOD, and BBT

BETTER BUILT TRUSS LOCATIONS

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1. PURPOSE

The purpose of this guideline is to improve worker safety and health by providing guidance for heat stress control when working in elevated temperatures inside or outside manufacturing buildings and/or when wearing protective clothing or equipment, which could compromise an individual's ability to dissipate excess body heat.

2. SCOPE

This guideline was developed to address the types of job conditions and work environments, which can be encountered at MEEK'S, HOMEWOOD, and BBT. Similar work conditions and/or the use of special protective clothing can also exist on certain jobs outside the buildings. When planning such jobs, or should these conditions develop or be anticipated during an outdoor job assignment, key portions of this directive or other appropriate heat stress countermeasures should be implemented. (Example: A job assignment on a hot humid summer day inside a steel tank requiring personal protective equipment will require countermeasures to reduce the risk of heat stress.)

To create awareness and to alert personnel of outdoor environmental factors, which can significantly contribute to heat stress, the Plant Safety Representative (PSR) will issue a "Heat Stress Alert" under certain conditions of temperature and humidity. This alert will remind MEEK'S, HOMEWOOD, and BBT and contract employees of the increased risk, the heat stress disorders which can develop, and the countermeasures that should be taken to reduce the risk of heat stress.

3. HEAT STRESS CAUSES BODY REACTIONS

Four environmental factors affect the amount of stress a worker faces in a hot work area: temperature, humidity, radiant heat (such as from the sun or a furnace) and air velocity. Perhaps most important to the level of stress an individual faces, are personal characteristics such as age, weight, fitness, medical condition and acclimatization to the heat.

The body reacts to high external temperature by circulating blood to this skin, which increases skin temperature and allows the body to give off its excess heat through the skin. If the muscles are being used for physical labor, however, less blood is available to flow to the skin and release the heat.

Sweating is another means the body uses to maintain a stable internal body temperature in the face of heat. Sweating, however, is effective only if the humidity level is low enough to permit evaporation and if the fluids and salts lost are adequately replaced.

Of course, there are many steps a person might choose to take to reduce the risk of heat stress, such as moving to a cooler place, reducing the work pace or load, or removing or loosening some clothing.

If the body cannot dispose of excess heat, it will store it. When this happens, the body's core temperature rises and the heart rate increases. As the body continues to store heat, the individual begins to lose concentration and has difficulty focusing on a

task. He/she may become irritable or sick and often loses the desire to drink. The next stage is most often fainting and then possibly death if the person is not removed from the heat stress.

4. RESPONSIBILITIES

Plant Safety Representative

In order to determine heat stress conditions, a Wet Bulb Temperature (WTB) reading should be taken as warranted by plant conditions. The location manager will review WBT results and the job site area conditions to determine if heat stress conditions are a job performance factor. If so, the Plant Safety Representative or a qualified designee will:

- Ensure that affected employees have received heat stress training.
- Brief affected employees on heat stress and countermeasures before exposure to HIGH HEAT STRESS conditions.

Employees

Each employee is responsible for being mentally and physically capable of performing their duties in a safe and reliable manner, and to report immediately to their supervisor about any medical treatment or medication being taken which could alter their physical or mental capability to perform their work safety. Individuals are also responsible for notifying their supervisor when environmental conditions change while performing work in a heat stress area.

5. HEAT DISORDERS

Heat Stroke

Heat stroke, the most serious health problem for workers in hot environments, is caused by the failure of the body's internal mechanism to regulate its core temperature. Sweating stops and the body can no longer rid itself of excess heat. Signs include:

1) Mental confusion, delirium, loss of consciousness, convulsions or comma
2) Body temperature of 106°F or higher
3) Hot dry skin, which may be red, mottled or bluish

Victims of heat stroke will die unless treated promptly. While awaiting medical help, the victim must be removed to a cool area and his/her clothing soaked with cool water. He/she should be fanned vigorously to increase cooling. Prompt first aid can prevent permanent injury to the brain and other vital organs.

Heat Exhaustion

Heat exhaustion results from loss of fluid through sweating when a worker has failed to drink enough fluids or take in enough salt or both. The worker with heat exhaustion still sweats but experiences extreme weakness or fatigue, giddiness,

nausea, or headache. The skin is clammy and moist, the complexion pale or flushed, and the body temperature normal or slightly higher. Treatment is usually simple. The victim should rest in a cool place and drink water or an electrolyte solution (a beverage used by athletes to quickly restore potassium, calcium, and magnesium salts). Severe cases involving victims who vomit or lose consciousness may require longer treatment under medical supervision.

Heat Cramps

Heat cramps, painful spasms of the muscles, are caused when workers drink large quantities of water but fail to replace their bodies' salt loss. Tired muscles – those used for performing the work – are usually the ones most susceptible to cramps. Cramps may occur during or after working hours and may be relieved by taking liquids by mouth or saline solutions intravenously for quicker relief, if medically determined to be required.

Fainting

Fainting (heat syncope) may be a problem for the worker unacclimatized to a hot environment who simply stands still in the heat. Victims usually recover quickly after a brief period of lying down. Moving around, rather than standing still, will usually reduce the possibility of fainting.

Heat Rash

Heat rash, also known as prickly heat, may occur in hot and humid environments where sweat is not easily removed from the surface of the skin by evaporation. When extensive or complicated by infection, heat rash can be so uncomfortable that it inhibits sleep and impedes a worker's performance or even results in temporary total disability. It can be prevented by resting in a cool place and allowing the skin to dry.

See Appendix A*

6. PREVENTING HEAT STRESS

Most heat-related health problems can be prevented or the risk of developing them reduced. Following a few basic precautions should lessen heat stress.

1) A variety of ***engineering controls*** including general ventilation and spot cooling by local exhaust ventilation at points of high heat production may be helpful. Shielding is required as protection from radiant heat sources. Evaporative cooling and mechanical refrigeration are other ways to reduce heat. Cooling fans can also reduce heat in hot conditions. Eliminating steam leaks will also help.

Equipment modifications, the use of power tools to reduce manual labor, and personal cooling devices or protective clothing are other ways to reduce the hazards of heat exposure for workers.

2) ***Work practices*** such as providing plenty of drinking water – as much as a quart per worker per hour – at the workplace can help reduce the risk of heat disorders. Training first aid workers to recognize and treat heat stress disorders and making the names of trained staff known to all workers is essential. Employers should also consider an individual worker's physical condition when determining his or her fitness for working in hot environments. Older workers, obese workers and personnel on some types of medication are at a greater risk.

3) Alternating ***work and rest periods*** with longer rest periods in a cool area can help workers avoid heat stress. If possible, heavy work should be scheduled during the cooler parts of the day, and appropriate protective clothing provided. Supervisors should be trained to detect early signs of heat stress and should permit workers to interrupt their work if they are extremely uncomfortable.

4) ***Acclimatization*** to the heat through short exposures followed by longer periods of work in the hot environment can reduce heat stress. New employees and workers returning from an absence of two weeks or more should have a 5-day period of acclimatization. This period should begin with 20 percent of the normal workload and time exposure the first day and gradually (increments of 20%) begin building up to 100 percent on the 5th day.

5) ***Employee education*** is vital so that workers are aware of the need to replace fluids and salt lost through sweat and can recognize dehydration, exhaustion, fainting, heat cramps, salt deficiency, heat exhaustion, and heat stroke as heat disorders. Workers should also be informed of the importance of daily weighing before and after work to avoid dehydration.

7. GENERAL

When employees are subjected to potential heat stress conditions, they are encouraged to drink at least 8-ounces of replacement fluids before and after work is performed. If possible, the consumption of replacement fluid is also encouraged during performance of such work. If personal protective equipment (Example: full face respirator, face shields, protective clothing, etc.) is to be used, employees must be cautioned on its use.

Employee shall be permitted to exit the work area at any time if they feel the ill effects of heat stress.

Employee must undergo medical screening to determine their suitability for using respiratory protection, working in heat stress areas, and performing unrestricted physical activity. Employees that have developed medical problems (illnesses or injuries) since their last exam, employees requiring the use of prescription or over the

counter medications, or employees returning to work after an illness or injury may be unsuitable for physically stressful work.

8. DETERMINING THE ACTION TIME

Determine the WBT and add the appropriate adjustment factor (AF), based upon clothing ensemble, to the WBT to determine the adjusted WBT (AWBT).

WBT + AF = AWBT

CLOTHING ENSEMBLE	ADJUSTMENT FACTOR (AF)
WC	0°F
CC	4°F
DCC	7°F
CPP	13°F

Determine the Action Time by referring to the table in Appendix A. Start with the AWBT in the first column and read Action Time (AT) under Work Demand.

If the Action Time is great than 30-minutes and the estimated exposure time is less than the Action Time, heat stress need not be considered. If the estimated exposure time is greater than the Action Time, heat stress countermeasures need to be considered.

If the Action Time is less than 30-minutes, it is a ***High Heat Stress*** condition. In these cases, the job supervisor shall complete the form shown in Appendix B.

9. HEAT STRESS COUNTERMEASURES, CHECK TIME AND RECOVERY

Countermeasures are implemented to reduce heat stress exposure. They may enable a person to work beyond the Action Time without experiencing the onset of heat stress symptoms.

Countermeasures to be considered are as follows:

- Increased ventilation/air motion
- Reduced work scope
- Reduced work demand levels
- Self-determination
- Re-evaluation of engineering controls
- Reduced clothing requirements
- Buddy system
- Personal protection

Check times will be established and implemented by the employee supervisor(s) when it is determined that the employee's exposure time will exceed the predetermined Action Time. Check times shall not exceed 15-minutes and must begin at the expiration

of the predetermined Action Time and continue until completion of job assignment or until Heat Stress exposure is discontinued. Check times shall consist of verbal/visual contact with the employee(s) to ascertain their ability to safely continue work.

The usual recovery times should be provided if a worker is required to exceed their predetermined Action Time. The usual recovery time is one hour in a cool location and may include only light works demands. This assures adequate recovery from the previous exposure.

10. NON-ROUTINE CONDITIONS

When temperatures are unknown but are anticipated to exceed 120°F AWBT or 135°F ambient, Action Time shall not exceed 15-minutes.

NOTE: When exposures to heat stress are well controlled, there are no significant effects of heat stress on employee performance or safety and health.