DEPARTMENT OF CORRECTIONS

Policy Number: 105.126
Title: Adverse Weather Guideline
Effective Date: 10/1/19

PURPOSE: To provide a process for the prevention of heat-related illnesses, cold weather exposure, and protection from severe weather.

APPLICABILITY: agency-wide

DEFINITIONS:
Air alerts – warnings on days when the air quality index (AQI) is above 100 ("unhealthy for sensitive groups"), indicating air pollution levels may cause adverse health effects for people with cardiovascular disease or lung disease, older adults, children, and even healthy people who are doing vigorous activity.

Air quality index (AQI) – an indicator based on measurements of four pollutants: fine particles (PM2.5), ozone, sulfur dioxide, and carbon monoxide.

Cold stress – extreme cold weather conditions that can bring on health emergencies in susceptible people, such as those without shelter, outdoor workers, and those who work in other areas that are poorly insulated or without heat.

Extreme cold weather – reported or forecasted temperatures of 25°F below zero or colder (without a wind) or any combination of wind and temperature that is 25°F below zero (-25°F) or colder.

Frost bite – injury to, or destruction of, skin and underlying tissue (most often that of the nose, ears, fingers, or toes), resulting from prolonged exposure to freezing or sub-freezing temperatures.

Heat cramps – cramps commonly resulting from performing hard physical work in a hot environment. These cramps often occur in the muscles used during work and are attributable to the continued loss of salt that occurs in sweating.

Heat exhaustion – symptoms are headache, nausea, vertigo, weakness, thirst, and giddiness.

Heat index – an index describing what the temperature really feels like. It is a composite of the effects of temperature, wind, humidity, sunshine intensity, cloudiness, precipitation, and elevation on the human body. The daily heat index is based on a scale from zero to 10. An index value ranging from four to six indicates the conditions at a specific location are typical for that period of the year. When heat index values range from zero to three, conditions are cooler than average and added stress from heat will not be a factor on those days. Conversely, heat index values ranging from seven to 10 indicate above-average heat stress conditions. Some discomfort may be noticed when the index ranges from seven to nine. A heat index above nine indicates severe stress and everyone needs to take precautions because they are not acclimated to such extreme conditions.

Heat stroke – occurs when the body's system of temperature regulation fails and the body's temperature rises to critical levels. The primary symptoms are confusion, irrational behavior, loss of consciousness, convulsions, a lack of sweating (usually), hot, dry skin, and an abnormally high body temperature (rectal)

of 105.8° Fahrenheit (41°C). If the body temperature rises too high, death may follow. The elevated metabolic temperatures caused by a combination of work load and environmental heat load, both of which contribute to heat stroke, are highly variable and difficult to predict.

Heavy work – rapid-paced and/or repetitive jobs. Examples include shoveling sand, carpenter sawing by hand, heavy assembly work, and pushing, pulling, or carrying heavy objects repeatedly.

Hypothermia – core, or internal, body temperature of less than 95°F (35°C). (Normal body core temperature ranges from about 98°F to 100°C (36.6°F to 37.7°C).

Icy weather conditions – weather conditions favorable to the development of ice, which occurs when freezing rain accumulates on surfaces and the ground. Severe impacts can occur as ice buildup can increase tree weight up to 30-fold and can add up to 500 pounds of weight to power lines, creating a high risk of tree branches, powerlines, and power poles falling to the ground.

Light work- primarily standing or sitting while working. Examples of light work include using a table saw, light assembly work, packaging operations, and using a riding mower.

Moderate work – increased levels of body movement, usually this will include walking or frequent arm movement. Examples of moderate work include scraping paint, lawn mowing with a push mower, and raking.

Radiant heat – energy in the form of electromagnetic radiation that is transformed into heat when it strikes an object. Radiant heat exchange is a function of the differential between the temperature of the skin and temperature of the surrounding surfaces. Radiation does not heat the air it passes through. For example, the heat from a boiler or from the sun transfers to (or heats) objects in their surrounding areas, but not the air itself.

Severe weather watch – see below, tornado/severe weather watch.

Tornado – a violently rotating column of air extending from the base of a thunderstorm down to the ground.

Tornado/Severe weather watch – weather conditions favorable for the formation of tornadoes or other severe weather.

Wet bulb globe temperature (WBGT) – indoor temperature reading taken with a special thermometer measuring three different aspects of the conditions. These three readings are then correlated to an index that indicates what the actual temperature feels like to the human body.

Wind chill – a measure of the combined cooling effect of wind and temperature.

Work modification – includes increasing the amount of breaks and assuring provision of readily available fluids.

PROCEDURES:

A. Staff training
   1. Training is required for the following staff and offender/resident workers:
      a) Personnel responsible for supervising staff or offenders who work outside in the heat or cold, or in hot indoor environments; and

b) Personnel (staff or offender/resident workers) who work outside in hot or cold conditions, or in hot indoor environments.

2. Training must include the following topics:
   a) Knowledge of the hazards of heat/cold stress;
   b) Recognition of predisposing factors, danger signs, and symptoms;
   c) Awareness of first-aid procedures for and potential health effects of heat/cold stress;
   d) Employee responsibilities in avoiding heat/cold stress;
   e) Use of protective clothing and equipment;
   f) How to access and read the heat index chart and wind chill index for outside work;
   g) Methods for reducing the effects of heat/cold stress; and
   h) Procedures for response to severe weather alerts.

3. All staff training must be documented in the agency-approved electronic training management system.

4. All offender/resident worker training must be documented on the Offender/Resident Safety Training form (attached), which is uploaded into the offender's/resident's electronic file in ODocS. A copy is given to the offender/resident and a copy is retained in the offender's/resident's work file.

B. Responsibilities
1. Supervisors must:
   a) Attend required severe weather training;
   b) Be aware of severe weather notification processes and emergency plans; and
   c) Be aware of the potential for heat/cold stress when assigning job tasks. Consider the following when evaluating job assignments for potential heat/cold stress problems:
      (1) Work climate;
      (2) Job intensity;
      (3) Job duration;
      (4) Acclimatization;
      (5) Physical fitness; and
      (6) Work attire/personal protective equipment (PPE).

2. Safety administrators must:
   a) Identify severe weather shelter areas;
   b) Be available for heat/cold stress prevention guidance/consultation;
   c) Be available to perform heat/cold stress evaluations and recommendations including:
      (1) Wet bulb globe temperature (WBGT) measurements;
      (2) Wind chill determination;
      (2) Engineering control implementation; and
      (3) PPE recommendations;
   d) Recommend appropriate work rest schedules for individual jobs; and
   e) Implement/administer heat/cold stress training and program.

3. Employees must:
   a) Be aware of the potential for heat/cold stress when performing job tasks;

b) Be aware of severe weather notification processes and emergency plans;
c) Contact the site supervisor, health services, and/or the safety administrator for heat/cold stress guidance;
d) Follow all safety procedures (as specified by their supervisors) including:
(1) Work/rest/warming periods;
(2) Appropriate work attire;
(3) Fluid maintenance; and
(4) Sun shades; and
e) Attend required heat/cold stress training.

C. Hazard assessment

1. Indoor

Work areas with sources of radiant heat (e.g., laundry, boiler rooms, and kitchens) may be measured for safe working conditions. The facility safety administrator must arrange for a WBGT, upon request, to determine the heat index for the indoor area.

2. Outdoor

Staff must monitor the weather to determine potential for heat-related illness, cold-related illness, or other hazardous weather conditions, and take the appropriate precautions.

3. Staff or offenders/residents performing work (not supervising or observing) and exposed to the heat index guidelines listed below must take at least 20 minutes of each two hour period to rest and drink fluids:
a) 82 degrees Fahrenheit or higher for heavy work;
b) 85 degrees Fahrenheit or higher for moderate work; and
c) 89 degrees Fahrenheit or higher for light work.

D. Recreation/yard activities

1. The yard may remain open and organized activities, such as softball, may take place since offenders/residents voluntarily take part in these activities and it would be considered light work by American Conference of Governmental Industrial Hygienists (ACGIH) standards.

2. In case of extreme temperature, the watch commander may limit outdoor activities. All changes to normal activity related to this policy must be documented in the watch commander's log.

E. Recommended controls for prevention of heat-related illnesses

1. Engineering controls

Fans, air cooling/conditioning, insulation, and shielding must be implemented when feasible to reduce external sources of heat loading in work areas.

a) Ventilation

General ventilation is used to dilute hot air with cooler air (usually cooler air is brought in from the outside). This technique, which relies on the principle of convection, does not work as effectively in the hotter climates.

b) Air conditioning

(1) Air conditioning reduces the temperature of the air by removing heat and humidity from air. The two main types are refrigerated and water-cooled systems.

(2) Portable or local air cooling can be effective and more practical at reducing air temperatures in small, specific areas. Cool room enclosures, can be used to enclose hot work areas or recovery areas near the job; for portable application, a blower with built-in air cooling may be used.

c) Convection

(1) Changes in air speed using fans may help workers stay cooler by increasing both the convective heat exchange and the rate of evaporation. The increase in air currents must directly impact the worker to be effective.

(2) If the temperature is higher than 95 degrees Fahrenheit, the hot air passing over the skin may actually make the worker hotter and offset any evaporative cooling. Increases in air speed also have no effect on workers wearing vapor-barrier clothing.

d) Insulation

Insulating hot surfaces, and/or substituting alternative materials that minimize surface heat loads, may reduce heat conduction.

e) Shielding

(1) Shielding may be used to reduce radiant heat by interrupting the flow between the source and the worker. Polished surfaces make the best barriers, although special glass or metal mesh surfaces can be used if visibility is a problem. Shields must not interfere with airflow and staff must keep them clean to maintain peak effectiveness.

(2) With some sources of radiation such as heating pipes, it is possible to use both insulation and surface modifications to achieve a substantial reduction in radiant heat.

2. Administrative controls

a) Acclimatization

(1) Acclimatization reduces heat stress by increasing the performance of the cardiovascular system and efficiency of the body's cooling system. This results in the ability of the worker to maintain normal body temperature in these extreme environments.

(2) An acclimatization program decreases the risk of heat-related illnesses and unsafe acts by gradually exposing employees to a hot work environment for progressively longer periods. For workers with prior exposure to hot job environments, the regimen should be 50 percent exposure on day one, increasing to 100 percent exposure by day four. For new, unacclimated workers, the regimen should be 20 percent on day one, with a 20 percent increase in exposure each additional day.

b) Fluid replacement

(1) Supervisors must provide workers with cool (50-60 degrees Fahrenheit) water and encourage them to drink frequently (one cup every 15 to 20 minutes or about one quart per hour). Water must be placed close to the work area for easy access. All sources of water must be changed out on a

periodic basis (at least daily). Water sources kept outside must be filled with ice.

(2) Salt supplements are not necessary when working in hot environments. A normal diet has sufficient quantities of salt to maintain the proper balance.

c) Work practices

The following work practices must be considered for reducing heat stress:

(1) Schedule hot jobs for the cooler part of the day. Schedule repair work in hot work areas for the cooler seasons of the year (when possible);
(2) Reduce the physical demands of work such as lifting of heavy objects or manual digging. Mechanical assists must be implemented when feasible to reduce workloads and internal metabolic heat production;
(3) Rest/recovery areas must be provided (e.g. air-conditioned areas, umbrellas, tents);
(4) Schedule intermittent rest periods with water breaks;
(5) Use relief workers;
(6) Use worker pacing;
(7) Assign extra workers;
(8) Provide chilled water at the worksite;
(9) Limit the number of workers in confined or enclosed spaces; and
(10) Use mechanical ventilation, if needed.

d) Personal protective equipment (PPE)

Certain types of PPE, such as respirators, can significantly increase heat stress. Therefore, heat stress factors must be taken into account when recommending PPE. PPE to help alleviate heat stress can include reflective clothing, ice vests, wetted clothing, or water-cooled garments and must be evaluated for effectiveness for various activities.

F. Cold weather considerations

Whenever the ambient air temperature is at or below zero degrees Fahrenheit or the wind chill is at or below negative five degrees Fahrenheit, the watch commander may cancel all or portions of offender/resident outdoor activities. Essential work duties continue as required. Staff performing essential work duties are provided appropriate clothing as available through the existing uniform clothing line.

G. Extreme cold locations

1. Supervisors must ensure that all staff and offenders/residents take all necessary precautions to avoid cold-related problems such as frostbite.

2. The area supervisor must ensure that staff receive cold weather training and periodic refresher training so that they are able to determine a course of action for staff and offenders/residents who are adversely affected by cold conditions.

3. The supervisor must provide staff and offenders/residents with the appropriate equipment to perform their assignments in cold conditions.

a) Offender/resident work crew members obtain cold-weather equipment from their supervisors.

b) Uniformed staff obtain cold-weather equipment from the uniform supplier.

H. Severe heat-related or extreme cold-related illness or injury

1. If an offender/resident is injured or ill from severe heat or extreme cold, staff must refer the offender/resident to health services for appropriate care.

2. If a staff member is injured or ill from severe heat or extreme cold, the staff person may obtain first-aid treatment at the facility or may use a medical facility for appropriate care or follow-up.

3. Heat cramps may be alleviated by resting and drinking water.

4. Workers suffering from heat exhaustion must be removed from the source of heat and provided fluid replacement along with adequate rest.

I. Tornado/Severe weather

When the weather service issues a tornado or severe weather watch or warning:

1. If a watch is issued, the supervisor or designee must notify only those areas or staff needing to be on alert to the potential of severe weather (e.g., perimeter, squad, and yard security staff; the yard crew supervisor; maintenance staff performing outside duties, etc.).

2. If a warning is issued, the supervisor or designee must:

a) Use available resources (e.g., Internet weather, news, perimeter patrol staff, yard officer observations from the walkway, etc.), and make a decision based on the information gathered.

b) If necessary, assume command of the facility using the Incident Command System (ICS). See Policy 301.140, "Incident Command System."

c) Direct all staff to inform offenders, visitors, contractors, and other staff of the precautions to be taken.

3. Designated shelter areas

a) In a tornado or severe weather situation requiring use of designated shelter areas, all staff, offenders, visitors, contractors, and others must move to the designated shelter areas.

b) Staff must ensure that all doors leading into and out of the designated shelter areas remain closed during a tornado or severe weather to minimize the potential for injury due to flying glass and debris.

c) All occupants must remain in the designated shelters until the control center announces an "all clear" via radio or public address system.

J. Lightning warning

While lightning on the horizon should warn of potential danger, lightning associated with thunder, or thunder alone, means there is immediate danger to individuals who are outdoors. Lightning can strike ten miles ahead of or behind the storm front and the thunderhead clouds. Staff and offenders must not resume outdoor activities until 30 minutes after a storm passes.

K. Air alerts

The Minnesota Pollution Control Agency (MPCA) issues an air quality alert on days when the air quality index (AQI) is above 100 ("unhealthy for sensitive groups"), indicating air pollution levels that may cause adverse health effects for people with cardiovascular or lung disease, older adults, children, and even healthy people who are doing vigorous activity. In case of an AQI, the watch commander or supervisor may limit outdoor activities or work for offenders, staff, or both.

L. Tornado Drills

1. Safety administrators at every DOC site must ensure that tornado drills are conducted annually, preferably during Minnesota's Severe Weather Awareness Week.

2. At the conclusion of each tornado drill, the area supervisor must complete an incident report documenting the completion of the drill, which must be sent to the facility/site safety administrator who retains it.

M. Eligibility for emergency leave

Any employee leave as a result of a weather emergency is administered under the provision of Policy 103.275, "Eligibility for Paid Emergency Leave."

INTERNAL CONTROLS:

A. All staff training is documented electronically in the agency-approved electronic training management system.

B All Offender/Resident Safety Training forms (105.125F) are uploaded into the offender's/resident's electronic file in ODocS. A copy is given to the offender/resident and a copy is retained in the offender's/resident's work file.

C. Yard/outdoor activity closures are documented in the watch commander's log.

D. The facility/site safety administrator retains the documentation of tornado drills.

ACA STANDARDS: None

REFERENCES:
Minn. Rule 5205.0110
Minn. Rules Ch. 5205
US Department of Labor, OSHA Technical Manual, Section III, Chapter 4
American Conference of Governmental Industrial Hygienists
Policy 103.275 "Eligibility for Paid Emergency Leave"
Policy 301.140, "Incident Command System"
City of Saint Paul – Severe Weather Awareness and Preparedness

REPLACES: Policy 105.126, "Adverse Weather Guideline," 1/20/15.
All facility policies, memos, or other communications whether verbal, written, or transmitted by electronic means regarding this topic.

ATTACHMENTS: Offender/Resident Safety Training form (105.125F)

APPROVALS:
Deputy Commissioner, Community Services

Deputy Commissioner, Facility Services
Assistant Commissioner, Operations Support
Assistant Commissioner, Facility Services