	MONTGOMERY COUNTY FIRE AND RESCUE SERVICE	25-06
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	Public Safety Training Academy Operations During Inclement Weather	March 13, 2018

Issued by: Fire Chief Scott E. Goldstein
Policy Number: 25-06
Authority: Montgomery County Code Section 21-3 (b)
Supersedes: *New policy*
Effective Date: March 13, 2018

SECTION 1. Purpose:

To establish a policy and procedure that governs the actions of MCFRS personnel while training during periods of extreme cold or heat.

SECTION 2. Applicability:

All MCFRS personnel, and those from other organizations, participating in Public Safety Training Academy-sponsored training.

SECTION 3. Background:

Many personnel are exposed to heat on the job, outdoors or in hot indoor environments. Operations involving high air temperatures, radiant heat sources, high humidity, direct physical contact with hot objects, or strenuous physical activities have a high potential for causing heat-related illness. Workplaces with these conditions may include iron and steel foundries, nonferrous foundries, brick-firing and ceramic plants, glass products facilities, rubber products factories, and fire and emergency services.

Outdoor operations conducted in hot weather and direct sun, such as farm work, construction, oil and gas well operations, emergency response operations, and hazardous waste site activities, also increase the risk of heat-related illness in exposed workers.

Environmental cold can affect any employee exposed to cold air temperatures and puts them at risk of cold stress. As wind speed increases, it causes the cold air temperature to feel even colder, increasing the risk of cold stress to exposed personnel, especially those working outdoors.

Risk factors for cold stress include:

a. Wetness/dampness, dressing improperly, and exhaustion;
b. Predisposing health conditions such as hypertension, hypothyroidism, and diabetes; and
c. Poor physical conditioning.

Direct indices have been developed to take environmental measurements with an instrument relevant to humans in the thermal environment. The most common of these is the Wet Bulb Globe Temperature, better known as the WBGT method, which was developed by the US Military in the 1950s to help reduce casualties in the Marine Corps. WBGT has been designed as a simple index which is easy to use and provide a quick result for diagnosis; it achieves this goal, hence its adoption by some regulators and its popularity in industry.

In addition to being exposed to high or low temperatures, emergency personnel may be exposed to dangerous storms during operations and training. The immediate danger that people frequently associate with severe weather is lightning. Most lightning deaths and injuries in the United States occur during the summer months, when the combination of lightning and outdoor activities reaches a peak. People working outdoors need to take the appropriate actions in a timely manner when thunderstorms approach.

Lightning may travel from cloud-to-cloud or cloud-to-ground during a storm. The lightning that travels to the ground is called positive lightning. Positive lightning is particularly dangerous because it frequently strikes away from the rain core, either ahead or behind the thunderstorm; it can strike as far as 5 or 10 miles from the storm, in areas that most people do not consider to be a lightning-risk area.

In addition to the visible flash that travels through the air, the current associated with the lightning discharge travels along the ground. Although some victims are struck directly by the main lightning stroke, many victims are struck as the current moves in and along the ground. If you can hear thunder, you are within 10 miles of a storm and can be struck by lightning.

SECTION 4. Definitions:

a. **Heat Stress Index** – A method used to estimate the impact of the thermal environment on a person. The Heat Stress Index is expressed as a Wet Bulb Globe Temperature reading, which considers the combined effect of air temperature, air speed, humidity, and solar radiation.

b. **Wet Bulb Globe Temperature** – WBGT is calculated by temperature readings from three thermometers on the WBGT instrument, including a dry bulb, wet bulb, and black globe.

c. **Acclimatization** – The ability of the body to undergo physiological adaptations so that the individual can cope better with the environmental and physiological heat stress. Acclimatization may take place over several days, but is reversible after cessation of exposure. Heat acclimatization increases sweating (by 50-100%) and this enhances the evaporative cooling capacity of the body. Increased sweating, however, can lead to dehydration. As such, individuals can adapt to heat (i.e. they can acclimatize), but not to dehydration. Physically fit individuals acclimatize more rapidly than the less fit. Incumbent

personnel will normally be considered as acclimated, while new recruits/candidates will normally be considered as non-acclimated.

d. **PSTA-Sponsored Training** – Any training occurring on PSTA property or where the MCFRS PSTA, or one of its representatives or managers, has provided a MICRB-certified instructor to facilitate, lead, or deliver training to other personnel, whether civilian or uniformed.

e. **Outdoor Alerting System (OAS)** – An electronic instrument that monitors and alerts when cloud-to-cloud and cloud-to-ground lightning is detected within a 10-mile radius of the PSTA.

f. **Remote Strobe** – An extension of the OAS-a red light that activates when the OAS alerts.

g. **Light work** – See Appendix A.

h. **Moderate work** – See Appendix A.

i. **Heavy work** – See appendix A.

SECTION 5. Policy:

a. It is the policy of MCFRS that all PSTA-sponsored training, whether at the PSTA or offsite, will adhere to the procedures set forth within. Where training may be bound by more than one weather policy, such as that occurring at another jurisdiction's training facility, MCFRS personnel will follow the policy that is more stringent.

b. All personnel are responsible for recognizing the signs and symptoms of environmental emergencies and initiating appropriate treatment in accordance with established protocols, policies, and procedures.

c. All personnel will seek shelter upon activation of the OAS.

d. A student's/trainee's level of fatigue will supersede any work/rest schedule or flag status; the lead instructor is ultimately responsible for making necessary adjustments to address perceived changes in level of fatigue.

e. WBGT will be the primary environmental reading used during all PSTA-sponsored training to determine flag conditions; 20^{o}F **will be added to the WBGT when personnel are wearing turn-out gear, encapsulation suits, or whole-body chemical protective suits, according to the OSHA Clothing Adjustment Factor Table, See Appendix D.**

f. Where local WBGT is not available, training parameters will default to MCFRS policy 811.

g. WBGT will be monitored daily by all instructors where students will be participating in outdoor activities; the WBGT will determine the corresponding flag status based on the chart in Appendix B.

h. Lead instructors will modify work/rest schedules based on the corresponding flag status.

i. Normal outdoor activities will occur between 20^0F-76^0F WBGT; any intense physical activity may precipitate heat exhaustion or heat stroke, so personnel must always exhibit caution and monitor themselves.

SECTION 6. Responsibility:

All personnel.

SECTION 7. Procedure:

a. The Lead Instructor will make every effort to obtain a WBGT flag status **prior** to every outdoor training activity and tailor work/rest cycles according to the corresponding chart in Appendix B.

1. For offsite training, the Lead Instructor will attempt to obtain and utilize a PSTA WBGT instrument and a flag kit.

   A. The Lead Instructor will ensure the appropriate flag is displayed according to the parameters in Appendix B.

2. The Lead Instructor or his/her designee will record the WBGT, corresponding flag status, time, and his/her name on an Environmental Condition Assessment for Training (ECAT) form for every outdoor session. See Appendix C.

   A. If a WBGT reading is unavailable, the latest heat index, according to the National Weather Service for the zip code of the training, will be utilized.

3. The Lead Instructor will ensure a WBGT reading is obtained and recorded on the ECAT **at least** every 3 hours during training.

   A. The Lead Instructor will ensure a WBGT reading is obtained when sudden changes in outdoor conditions are expected.

   B. The Lead Instructor will ensure WBGT readings are obtained frequently when high heat/high humidity or cold front conditions are expected.

4. All ECATs will be submitted with class files.

b. The Lead Instructor shall ensure an appropriate rest area, which provides shelter from the elements, a sitting area, cross-ventilation, and water, is available to participants.

1. At least 1 fan will be provided in the rest area during Green and Yellow flag conditions for participants in moderate-to-heavy work.

2. At least 2 fans will be provided during Red flag conditions for participants in moderate-to-heavy work.

3. A rehabilitation area shall be set up during Red flag conditions and operated according to IRP Appendix R; personnel vitals, names, and time entered/left rehab shall be recorded and kept with the class file.

c. The Training Chief or his/her designee will attempt to maintain an updated flag status that will be made reasonably visible to personnel outside.

d. Upon activation of the OAS alert tone, all personnel will seek shelter in the closest building.

1. The Lead Instructor will perform a PAR to ensure all students have entered the shelter.
2. Personnel operating in the lower section of the PSTA complex, near the burn buildings, should normally seek shelter in the Apparatus Bay building, which houses the remote strobe.
3. Personnel must not leave shelter until the OAS or remote strobes cease to illuminate and the Lead Instructor has given direction that it is safe to do so.
4. At times when the OAS is inoperable or otherwise unavailable, such as during off-site Training, the Lead Instructor shall ensure all personnel seek shelter for 30 minutes after the last sound of thunder.

SECTION 8. Cancellation:

This is a new policy.

SECTION 9. Attachments:

a. Appendix A: Work Examples
b. Appendix B: Flag Conditions and Work/Rest Cycles
c. Appendix C: Environmental Condition Assessment for Training
d. Appendix D: Osha Clothing Adjustment Factors

SECTION 10. References:

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Occupational Safety and Health Administration. (n.d.a). Winter weather. Retrieved from https://www.osha.gov/dts/weather/winter_weather/windchill.html

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Approved:

Scott Goldstein

Fire Chief

March 13, 2018

Date

ATTACHMENTS

Appendix A – Work Examples

LIGHT WORK	MODERATE WORK	HEAVY WORK
Driving	Auto Extrication	Live Fire Training
Equipment Maintenance	Auto Fire Extinguishment	Search & Rescue w/ PPE
Pump Operations	Hose Line Deployment	Hazmat Ops w/ PPE
Ropes & Knots	Packing Hose	Running
Filling Cylinders	Ladder Raises	
Walking	Calisthenics	

Appendix B: Flag Conditions and Work/Rest Cycles

*All temperatures correspond to degrees Fahrenheit using WBGT

*If PPE is used, add 20 degrees to WBGT

FLAG CONDITION with WBGT RANGE	WORK/REST RATIO
GREEN 76 to 79.9 (Non-acclimated) 79 to 82.9 (Acclimated)	**75% Work/25% Rest** *Marginal Heat Stress limit for all personnel* • Use caution for moderate-to-heavy work for non-acclimated personnel
YELLOW 80 to 81.9 (Non-acclimated) 83 to 85.9 (Acclimated)	**50% Work/50% Rest** • Moderate-to-heavy work limited to those acclimated 14 days or more to training in heat • Allow 14 days for non-acclimated personnel to *ease into* moderate-to-heavy work in these temperatures
RED 82 to 90.9 (Non-acclimated) 86 to 90.9 (Acclimated)	**25% Work/75% Rest** • Limit moderate-to-heavy work for personnel with less than 90 days training in hot weather
BLACK Greater or equal to 91 (All personnel) Less than or equal to 20 (All personnel)	**10% Work/90% Rest** • *All moderate-to-heavy work will be stopped*

Appendix C: Environmental Condition Assessment for Training

Date: _____

Start Time of Training: _____

End Time of Training: _____

Description of Training: _____

TIME	FLAG CONDITION	WORK CATEGORY	WORK/REST RATIO	SIGNATURE	FDID
			/		
			/		
			/		
			/		
			/		
			/		

_____ _____

Lead Instructor Signature FDID

The Lead Instructor must ensure a WBGT reading (or Heat Index if WBGT unavailable) is recorded prior to the start of training and at least every 3 hours thereafter until the conclusion of training. Keep this form with the class file.

Appendix D: Clothing Adjustment Factors

*All temperatures in degrees Fahrenheit

Clothing worn	**CAF**
Work clothes (long sleeves and pants-standard cotton shirt/pants)	0
Coveralls (w/only underwear underneath-cotton or light polyester)	0
Double-layer woven clothing	5
SMS Polypropylene Coveralls	1
Limited-use vapor-barrier coveralls, e.g. encapsulating suits, whole-body chemical protective suits, firefighter turn-out gear	20

Adapted from *Occupational Safety and Health Administration Technical Manual: Heat Stress,* by Occupational Safety and Health Administration, 2017.