

State Fire Marshal Training Division

8-29-07

Environmental Conditions Guide (Extreme Weather)

Purpose: The State Fire Marshal Training Division has implemented a Hydration Policy for the protection of students and instructors. All instructors, training officers, and training facilities will monitor weather conditions for any training session or testing site involving skills training/testing, the use of protective clothing, or any session/site where strenuous work is expected of the students and/or instructors. Environmental conditions have been proven to have a significant impact on an individual's physiological response to physical activity.

Guide: This guide addresses extreme heat, extreme cold, and other inclement weather conditions for participants prior to, during, and after the completion of any strenuous practical training evolutions or testing sites; and is to be used as a guide for the Hydration Policy. The Lead Instructor, in conjunction with Assistant Instructors, of the SFM Training Division shall adjust or postpone related activities as weather conditions warrant. These decisions shall be made in cooperation with the local AHJ.

Procedure: The Lead Instructor for the SFM Training Division is required to adhere to the policy for all courses/classes/sessions/testing sites. However, the SFMTD policy and subsequent guidelines will not circumvent any locally established policies; as long as those policies are designed to protect the emergency response organization employees and are more stringent than the guidelines/policy of the State Fire Marshal Training Division.

All local AHJ rules, regulations, guidelines, policies, or contractual agreements must be reviewed prior to the implementation of the SFMTD policy. These local rulings must be acquired prior to any commencement of activities or training/testing evolutions.

The Heat and Wind Chill Indexes, as developed by the National Weather Service, will be used as the guide for determining extreme heat and cold conditions. Local weather conditions for the class/test site shall be used because conditions can vary greatly over a relatively small geographic area (i.e. information may have come from a source quite some distance from the class/test site).

Extreme Heat Conditions-

- Outside activities requiring physical activity or the use of full protective clothing/equipment (including the use of chemical protective clothing) should not be conducted if the heat index has reached 100 degrees Fahrenheit or is expected to reach 100 degrees Fahrenheit.
- When the heat index is between 100°F and 110°F, conditions may be considered dangerous. Any decision by the Lead Instructor to forego these precautions must be explained to all assisting instructors, the local AHJ, and all students. Parameters must be established for all training/testing, and a safety officer must monitor the operational periods for the students/instructors.
- Full personal protective clothing may create conditions whereas the ambient heat index may have to be increased by an additional 10 degrees Fahrenheit. Other factors such as age and the physical condition may also make an individual more vulnerable to heat conditions and disorders.
- Factors such as time of day, length of activity, type of activity, and the student's direct participation may influence the decision for modification or postponement of the class/course/test.
- Outside training/testing activities that require physical activity or full protective clothing may be conducted, but the following suggestions/examples of such activities must be evaluated in each case. This is only a sampling of all activities that would warrant an evaluation of weather conditions, and some requirements – based on the Hydration Policy.
 - Live fire training/interior fire attack testing – should be evaluated for each class/course/testing site
 - Activities other than live fire/interior fire attack, where the activities can be safely conducted with reduced protective clothing (i.e. helmet, gloves, and boots/safety shoes)
 - All skills-driven evolutions – an adequate supply of cool drinking water (note – not 'iced-down' water), EMS personnel available for monitoring and assistance, and a rehab station established for rest and rehydration
 - All skills-driven evolutions – strenuous physical activity is monitored and limited to 15-20 minutes of activity
- Instructors should monitor students to make sure they are not attempting to hyperhydrate (explanation at the end of the Guide) before, during or after a training/testing session. Do not permit excessive water or water/Gatorade combination consumption. Gatorade should be mixed with water to make a 50-50 drink.

- The following chart, developed by the National Weather Service, will be used as the guide for all decisions.

National Weather Service – Heat Index

		Temperature (°F)															
		80	82	84	86	88	90	92	94	96	98	100	102	104	106	108	110
Relative Humidity (%)	40	80	81	83	85	88	91	94	97	101	105	109	114	119	124	130	136
	45	80	82	84	87	89	93	96	100	104	109	114	119	124	130	137	
	50	81	83	85	88	91	95	99	103	108	113	118	124	131	137		
	55	81	84	86	89	93	97	101	106	112	117	124	130	137			
	60	82	84	88	91	95	100	105	110	116	123	129	137				
	65	82	85	89	93	98	103	108	114	121	128	136					
	70	83	86	90	95	100	105	112	119	126	134						
	75	84	88	92	97	103	109	116	124	132							
	80	84	89	94	100	106	113	121	129								
	85	85	90	96	102	110	117	126	135								
	90	86	91	98	105	113	122	131									
	95	86	93	100	108	117	127										
	100	87	95	103	112	121	132										

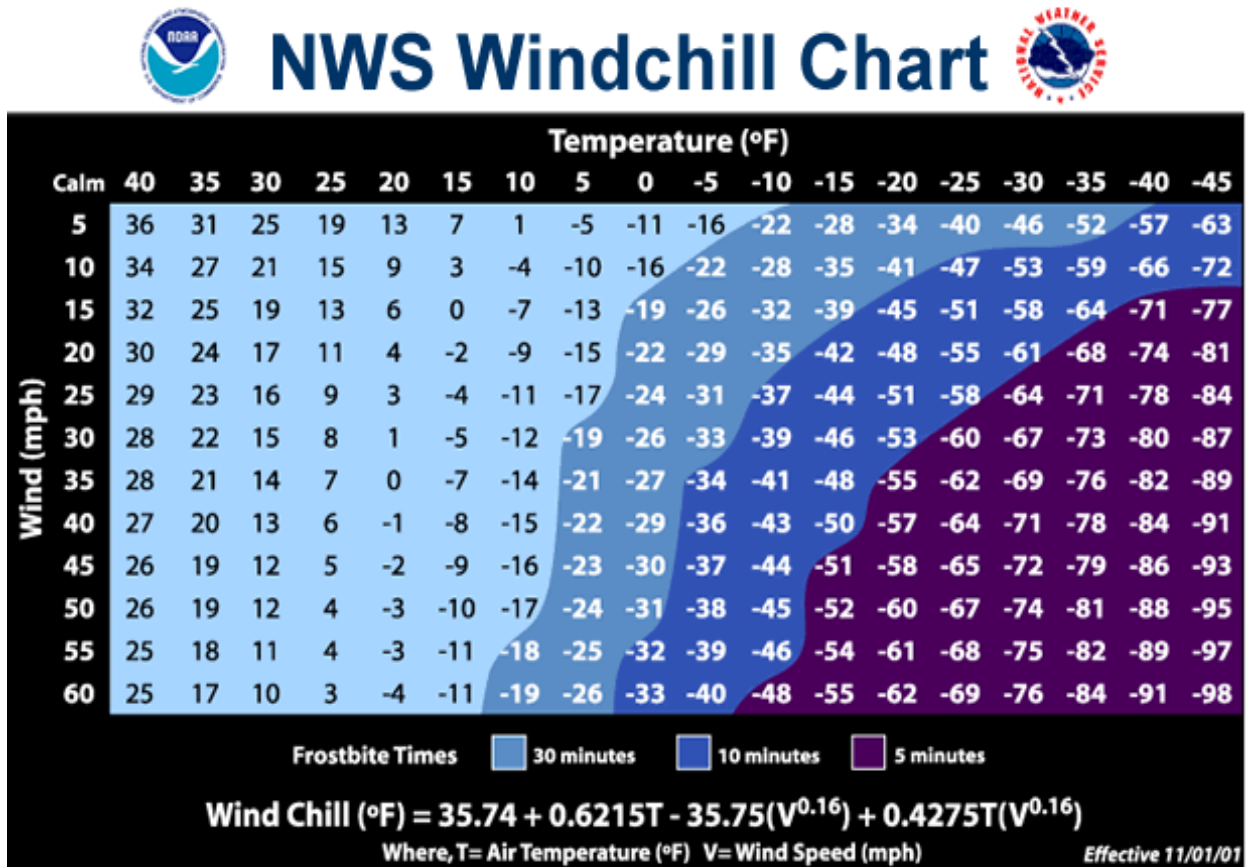
Likelihood of Heat Disorders with Prolonged Exposure or Strenuous Activity

- Caution
- Extreme Caution
- Danger
- Extreme Danger

Extreme Cold Conditions-

- Depending on the training location, the location’s proximity to wind barriers, and time of day; the wind chill factors may vary as stated on the National Weather Service chart.
- Frostbite is possible at temperatures less than 0°F and temperatures are considered dangerous at 20°F
- Outside training activities or testing stations should not be conducted when the wind chill factor is less than 20°F, unless:
 - Students are properly dressed for the appropriate cold weather activity

- The cold weather will not affect the safe and proper function of tools, equipment, and apparatus
 - An adequate supply of warm liquids and/or food is available at the training/testing site
 - Strenuous physical activity is monitored and limited to 15 to 20 minutes
 - A heated indoor rehabilitation area is in close proximity to the training/testing site
- Weather conditions, such as described above, will also produce other conditions that must be monitored. Any of these conditions may influence the decision for modification or postponement of the class/course/test. Such conditions may be freezing moisture creating slick surfaces, visibility because of fog, or freezing moisture on tools, appliances, and apparatus.
- The following chart, developed by the National Weather Service, will be used as the guide for all decisions.



Other Weather Conditions-

- Other extreme weather conditions must be evaluated before training/testing activities are permitted to begin.
- Based on previously mentioned weather conditions and local observations, in conjunction with local weather reports and the local AHJ; the Lead Instructor may determine if the class/course/test activities must be modified or postponed due to inclement weather conditions.
- Conditions such as the following, but not limited to this list, are:
 - High winds
 - Excessive snow or snow cover on the ground
 - Sleet or ice
 - Heavy rain or hail
 - Thunderstorms, including lightning (F-B Method at end of Guide)
 - Tornado watches, and specifically warnings
- Instructors should monitor students for inappropriate functions, acts of bravery and belittlement of the Instructor's decision, and improper placement of personnel or individuals in relationship to the weather conditions.
- Do not permit the Incident Command System structure to be compromised by those who may declare themselves as invincible to any of the weather conditions listed above or what is happening or predicted to happen in the localized area.

EXPLANATION INFORMATION-

Hyperhydration – Definition:

Water intoxication (also known as **hyperhydration** or **water poisoning**) is a potentially fatal disturbance in brain function that results when the normal balance of electrolytes in the body is pushed outside of safe limits by a very rapid intake of water. Normal, healthy individuals have little to worry about accidentally over-consuming water. Nearly all deaths related to water intoxication in normal individuals have resulted either from water drinking contests, in which individuals attempt to consume several gallons over the course of just a few minutes, or long bouts of intensive exercise during which time electrolytes are not properly replenished, yet massive amounts of fluid are still consumed. *Information from 'Wikipedia'*

Training Division Interpretation:

Hyperhydration is the rapid consumption of an excessive amount of water/fluids with the hope of building up an above-average amount of hydration so the body will function longer and not dehydrate.

Some articles, by the military and numerous sports individualists, refer to athletes and fire fighters as examples of those who have an exceptionally high impact to their systems from strenuous and rigorous work; especially when heat and humidity are involved.

Regardless, this isn't the way to prepare for training or testing. Preparation before the event - the day before or hours before, will produce better results than attempting to accomplish suitable hydration in a matter of minutes.

Lightning – the FLASH-to-BANG (F-B) Method:

To estimate the distance between you and a lightning flash, use the "Flash to Bang" method: If you observe lightning, count the number of seconds until you hear thunder. Divide the number of seconds by five to get the distance in miles.

Example: If you see lightning and it takes 10 seconds before you hear the thunder, then the lightning is 2 miles away from you (10 divided by 5 = 2 miles).

If Thunder is heard	The Lightning is...	If Thunder is heard	The Lightning is...
5 seconds after a Flash	1 mile away	25 seconds after a Flash	5 miles away
10 seconds after a Flash	2 miles away	30 seconds after a Flash	6 miles away
15 seconds after a Flash	3 miles away	35 seconds after a Flash	7 miles away
20 seconds after a Flash	4 miles away	40 seconds after a Flash	8 miles away

Get to a safe location if the time between the lightning flash and the rumble of thunder is 30 seconds or less.

Credit for the information contained in this Guide is given to the University of Maryland, Maryland Fire and Rescue Institute; and to the Center for Fire Fighter Safety Research and Development, located at the Maryland Fire and Rescue Institute at College Park. The release of the publication called "Health and Safety Guidelines for Firefighter Training" was the main source of information for the SFMTD Guide, as reference for the Hydration Policy.

Credit is also given to the National Weather Service for the charts depicting conditions to be considered dangerous for extreme heat or extreme cold.