



Reply to the attention of:

AUG 19 2011

MEMORANDUM FOR: REGIONAL ADMINISTRATORS  
STATE PLAN DESIGNEES

THROUGH: *Richard E. Fairfax*  
RICHARD E. FAIRFAX  
Deputy Assistant Secretary

FROM: *Thomas J. Galassi*  
*For* THOMAS GALASSI, Director  
Directorate of Enforcement Programs

SUBJECT: Heat-Related Illness Inspections

The purpose of this memorandum is to inform you of the enforcement aspect of the Occupational Safety and Health Administration's (OSHA) 2011 agency wide heat-related illness campaign to raise awareness among workers and employers of the risks associated with working in hot environments. The U.S. Centers for Disease Control and Prevention (CDC) reported 423 heat-related deaths among workers in agricultural and non-agricultural worksites over a period from 1992-2006<sup>1</sup>. The goal of the Agency is to raise employers' and workers' awareness and to prevent heat-related illnesses and deaths. The campaign focuses mainly on compliance assistance and outreach among outdoor workers in the construction and agricultural industries. However, the enforcement component outlined in this memorandum sets forth the duty of employers to prevent heat-related illnesses and deaths in both indoor and outdoor workplaces.

Heat-related illnesses generally occur when body heat generated by physical work is exacerbated by ambient heat and humidity. Heat-related illnesses range from a mild form of heat cramps to heat stroke, which can lead to death.

Typical indoor worksites where heat-related illnesses may occur include foundries, brick-firing and ceramic plants, glass production facilities, rubber products factories, electrical utilities (particularly boiler rooms), bakeries, confectioneries, commercial kitchens, laundries, food canneries, chemical plants, mining sites, and smelters. Outdoor operations conducted in hot weather, such as agriculture, landscaping, construction operations, refining (gas and oil well operations), asbestos removal, and hazardous waste site activities, especially those that require wearing protective clothing, also may cause heat-related illnesses among exposed workers.

<sup>1</sup> MMWR, June 20, 2008, Vol.57:No.24:647-653, at <http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5724a1.htm>

During inspection activity, Compliance Safety and Health Officers (CSHOs) should address heat-related illnesses at both indoor and outdoor worksites where potential heat-related hazards may exist, and inspections should include a review of the employers' plans to address heat exposure. This memorandum outlines inspection guidance taken from the OSHA Technical Manual, Section III, Chapter 4. In addition, the following documents are attached: a sample 5(a)(1) citation for heat-related illness, a heat index chart, employer and worker questionnaires, a sample hazard alert letter for heat-related illnesses, and links to online resources on heat-related illnesses. CSHOs should use the attached information as a guide along with the OSHA Technical Manual when conducting heat-related investigations.

The State Plan States have been asked to participate in OSHA's nationwide outreach effort to prevent heat-related illnesses and should follow the enforcement guidance in this memorandum as applicable.

Attachments

## HEAT-RELATED ILLNESS INSPECTION GUIDANCE

**PURPOSE:** To provide guidance to CSHOs investigating workplace conditions that pose a risk of heat-related illness. OSHA does not have a standard relating to working in hot environments. Any proposed citations for heat-related illnesses will be addressed by the General Duty Clause, Section 5(a)(1) of the OSH Act. Heat-related illness violations will be issued for both indoor and outdoor work activities, but must only be issued when all elements of a General Duty Clause violation are documented **and** CSHOs can establish a link between the workplace exposure and the potential for heat-related illness(es). A Hazard Alert Letter (HAL) may be sent when all the General Duty Clause elements are not present. OSHA has standards that may be applicable to work in hot environments including, but not limited to: personal protective equipment, sanitation, medical services and first aid, and recordkeeping.

**HEAT-RELATED ILLNESSES:** During the course of any heat-related investigation, CSHOs may encounter a variety of heat-related illnesses such as the following:

- Heat Stroke
- Heat Exhaustion
- Heat Cramps
- Heat Collapse
- Heat Rashes
- Heat Fatigue

### CASE FILE DOCUMENTATION:

- In order for the agency to track its inspection activity on heat-related illnesses, it is essential to gather data related to this hazard. All inspections involving heat-related illnesses must be coded on the OSHA 1, in the box 42, Type: N, ID: 02 Value as either "HEATCON" (construction), "HEATGI" (general industry), "HEATMI" (maritime) or "HEATAG" (agriculture) respectively.
- Review OSHA 300 Logs for any entries indicating heat-related illness. Interview workers for reports of headache, dizziness, fainting, dehydration, or other symptoms that may indicate heat-related illnesses.
- Review injury and illness reports and obtain any records of emergency room visits and/or ambulance transport even if hospitalizations did not occur.
- Document the information listed in the attached questionnaires.
- Conduct a walk-around inspection and perform temperature measurements, including wet bulb globe temperature (WBGT) tests. Additionally, identify all potential sources of heat-related illnesses. The information obtained from employer and employee interviews should also be verified during the walk-around inspection. Consult the OSHA Technical Manual – Section III, Chapter 4 - Heat Stress for additional inspection procedures and documentation guidance.
- Document the heat index and any National Weather Service heat advisory or alert for the day of the inspection and/or the days employees became ill.
- Document whether water, cooling areas and first aid or prompt medical attention are readily available.

A Section 5(a)(1) citation shall be proposed for cases involving both indoor and outdoor workplace exposures when all the elements outlined in the Field Operation Manual (FOM) have been established and there is evidence of a serious heat-related hazard. Refer to the FOM, Chapter 4, Section III, for enforcement guidance on the application of the General Duty Clause. The Regional Solicitor's office shall be consulted for citation drafting guidance prior to any heat-related 5(a)(1) citation being issued. Additionally, Area Offices are encouraged to contact the Directorate of Enforcement Programs for any technical or interpretative assistance.

#### **SAMPLING PROCEDURES:**

- When appropriate, conduct workload assessments. Information on performing workplace assessments can be obtained from the OSHA Technical Manual, Section III, Chapter 4.
- When appropriate, conduct environmental sampling including wet-bulb globe temperature (WBGT) readings, which combine air temperature and humidity. WBGT sampling is considered a better indicator of the effects of heat on individuals than a dry bulb thermometer reading. Refer to the OSHA Technical Manual, Section III, Chapter 4, for information on conducting WBGT sampling.

#### **OTHER APPLICABLE STANDARDS**

- The Personal Protective Equipment (PPE) standard at 29 CFR 1910.132(d) requires every employer in general industry to conduct a hazard assessment to determine the appropriate PPE to be used to protect employees from the hazards identified in the assessment. See also 29 CFR 1915.152 (shipyard), 29 CFR 1917.95 (maritime) and 29 CFR 1926.28 (construction).
- The Recordkeeping regulation at 29 CFR 1904.7(b)(5) requires that employers record certain work-related injuries and illnesses. If a worker requires medical treatment beyond first aid, the worker's illness or injury must be recorded. However, if a worker merely requires first aid for the worker's condition, the employer is not required to record the condition. For example, if a worker requires intravenous fluids, the worker's condition must be recorded. But if a worker is only instructed to drink fluids for relief of heat stress, the worker's condition is not recordable. Refer to 29 CFR 1904.7(b)(5) for an explanation of the difference between medical treatment and first aid.
- The Sanitation standards at 29 CFR 1910.141, 29 CFR 1915.88, 29 CFR 1917.127, 29 CFR 1918.95, 29 CFR 1926.51 and 29 CFR 1928.110 require employers to provide potable water.
- The Medical Services and First Aid standards at 29 CFR 1910.151, 29 CFR 1915.87, 29 CFR 1917.26, 29 CFR 1918.97, 29 CFR 1918 Appendix V to Part 1918 and 29 CFR 1926.50, require that persons onsite be adequately trained to render first aid, in the absence of medical facilities within close proximity.
- The Safety Training and Education standard for construction at 29 CFR 1926.21.

**NOTE:** The OSHA Technical Manual, Section III, Chapter 4 (workload assessment) is currently under revision. Contact the Office of Health Enforcement (OHE) or the Directorate of Technology, Support and Emergency Management (DTSEM) for updates.

## **SAMPLE 5(a)(1) VIOLATION FOR HEAT STRESS ILLNESS**

Section 5(a)(1) of the Occupational Safety and Health Act of 1970: The employer did not furnish employment and a place of employment which were free from recognized hazards that were causing or likely to cause death or serious physical harm to workers, in that the workers were exposed to excessive heat:

On or about [date], employees of [company name] were exposed to the hazard of excessive ambient heat from [specify the environmental or process sources generating the heat and any heat measurements taken] during the performance of their duties, which included [describe duties]. Such exposures may lead to the development of serious heat-related illnesses such as [describe heat-related illness(es) workers were at risk of developing; if there was an actual heat-related illness, describe it]. [Discuss any actions the employer took or failed to take that contributed to the risk of heat-related illness].

Feasible and acceptable methods to abate this hazard include, but are not limited to:

1. Providing adequate amounts of cool, potable water and electrolyte replacements (specific recommendations should be made by medical consultation) in the work area and require employees to drink frequently.
2. Providing a work/rest regimen.
3. Training employees about the effects of heat-related illness, how to report and recognize heat-related illness symptoms and how to prevent heat-related illnesses.
4. Including a heat acclimatization program for new employees or employees returning to work from absences of three or more days.
5. Providing a cool, climate-controlled area where heat-affected employees may take their breaks and/or recover when signs and symptoms of heat-related illnesses are recognized.
6. Providing shaded areas where heat-affected employees may take their breaks and/or recover on worksites that don't have access to climate-controlled areas.
7. Providing specific procedures to be followed for heat-related emergency situations and procedures for first aid to be administered immediately to employees displaying symptoms of heat-related illness.
8. Using dermal patches for monitoring core temperature to better identify when workers need to be removed from the work area.

## HEAT INDEX CHART FROM NOAA

To find the heat index, look at the Heat Index Chart. As an example, if the air temperature is 96°F (found on the top of the table) and the relative humidity is 65% (found on the left of the table), the heat index--how hot it feels--is 121°F. The National Weather Service will initiate alert procedures when the Heat Index is expected to exceed 105°- 110°F (depending on local climate) for at least 2 consecutive days.

<http://www.nws.noaa.gov/om/heat/index.shtml#heatindex>

### Heat Index<sup>2</sup> (bold numbers in table)

		Dry Bulb 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	126	130					
	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

**IMPORTANT:** Since heat index values were devised for shady, light wind conditions, exposure to full sunshine can increase heat index values by up to 15°F. Also, strong winds, particularly with very hot, dry air, can be extremely hazardous.

<sup>2</sup> Adapted from the National Weather Service (NWS) of the National Oceanic Atmospheric Administration (NOAA), at: <http://www.nws.noaa.gov/om/heat/index.shtml#heatindex>

## EMPLOYER QUESTIONNAIRE

Company Name \_\_\_\_\_

Inspection number \_\_\_\_\_

Date \_\_\_\_\_

CSHO \_\_\_\_\_

Time \_\_\_\_\_

Weather Conditions (Heat Index, NOAA-advisory)

\_\_\_\_\_  
\_\_\_\_\_

Temperature (dry bulb) \_\_\_\_\_

WBGT Reading(s) \_\_\_\_\_

Temperature (wet bulb) \_\_\_\_\_

Instrument Serial # \_\_\_\_\_

Instrument Manufacturer \_\_\_\_\_

Wind Conditions

Speed \_\_\_\_\_

Relative Humidity \_\_\_\_\_

Direction \_\_\_\_\_

Indoor / Outdoor \_\_\_\_\_

Direct Sun YES / NO

What are the potential sources of heat?

\_\_\_\_\_

What actions were implemented to prevent heat-related illnesses?

\_\_\_\_\_

Is there an acclimatization program in place for new employees or employees having been away for extended time (e.g., vacation)?

\_\_\_\_\_

Are the employees acclimatized to the work environment?

\_\_\_\_\_

Are employees required to wear protective clothing or equipment? If so, please describe.

\_\_\_\_\_

Have employees complained of the heat?

\_\_\_\_\_

What is the protocol should employees suffer heat-related illnesses?

\_\_\_\_\_

Have your employees received training for working in hot environments?

\_\_\_\_\_

Are work areas monitored routinely for work conditions related to heat stress?

\_\_\_\_\_

## EMPLOYEE QUESTIONNAIRE

Employee name: \_\_\_\_\_

Job Description: \_\_\_\_\_  
\_\_\_\_\_

How long have you worked at this task or work assignment?  
\_\_\_\_\_

What types of PPE are you required to wear?  
\_\_\_\_\_

What are the potential sources of heat?  
\_\_\_\_\_

Is there a Work/Rest Cycle in Place? YES / NO

Is a shaded or climate-controlled area available for rest periods? YES / NO

If applicable, describe the work/rest cycle (e.g., how many breaks do you take, when/where do you take breaks, how long is a typical break, etc.):  
\_\_\_\_\_

If a shaded or climate-controlled area is available for rest periods, describe:  
\_\_\_\_\_

Is drinking water available? YES / NO

If yes, describe drinking water source and proximity to workers:  
\_\_\_\_\_

Are you required to drink water or any other beverages when working under hot conditions?  
YES / NO

If so, is there a specific amount? \_\_\_\_\_

Is it enforced? \_\_\_\_\_

Have you experienced any health effects related to working in excessive heat?

If yes, describe:  
\_\_\_\_\_

Are other workers experiencing similar symptoms?  
\_\_\_\_\_

Have you received any training on the effects of heat and heat-related illnesses? YES / NO

If yes, what information was provided?  
\_\_\_\_\_



## SAMPLE HAZARD ALERT LETTER

*Note: This letter must be adapted to the specific circumstances noted in each inspection. The letter below is an example of the type of letter that may be appropriate in some circumstances. If the employer has implemented, or is in the process of implementing efforts to address hazardous conditions, those efforts should be recognized and encouraged, if appropriate. CSHO should tailor the recommended controls outlined below to the specific needs of the employer.*

*Italicized and bracketed text are for OSHA compliance use only and should not be included in the letter.*

Dear Employer:

An inspection of your workplace and evaluation of your OSHA recordkeeping logs at [location] on [date] disclosed the following workplace condition(s) which have been associated with the development of heat-related illnesses in workers:

[Describe the conditions observed for each task or job, including the type of PPE worn, the length of time spent on each task, the nature of the heat exposure, and any other information relevant to workers' exposure to the risk of heat-related illness].

In the interest of workplace safety and health, I recommend that you voluntarily take the necessary steps to materially reduce or eliminate your workers' exposure to the conditions listed above, including, but not limited to, the following:

### **General Controls.**

General controls include training, personal protective equipment (PPE), administrative controls, health screening and heat alert programs.

1. **Training:** inform workers of the following (*Modify this list as appropriate for the specific situation*):

- a. Hazards of heat stress.
- b. How to avoid heat stress by recognizing and avoiding situations that can lead to heat-related illnesses.
- c. Recognition of signs and symptoms of heat-related illnesses.
- d. First-aid procedures.
- e. Employer's program to address heat-related illnesses.

**2. Personal Protective Clothing and Equipment** (*CSHOs should recommend the appropriate PPE*).

- a. Hats for work outdoors in the sun.
- b. For indoor work, loosely worn reflective clothing to deflect radiant heat, such as vests, aprons or jackets.
- c. Cooling vests and water-cooled/dampened garments may be effective under high temperature and low humidity conditions. However, be aware that cooling vests can become an insulator when they reach the body's temperature.
- d. In environments where respirator usage is necessary, consult with an industrial hygienist to determine the appropriate clothing to prevent heat stress while still protecting the workers.
- e. Consider the use of dermal patches for monitoring core temperature to better identify when workers need to be removed from the work area.

**3. Administrative Controls:** (*CSHOs should consult the OSHA Technical Manual, Section III, Chapter 4 for additional information*)

- a. Schedule hot jobs for cooler parts of the work day, and routine maintenance and repair work should be scheduled for the cooler seasons of the year when possible.
- b. Provide adequate drinking water on the worksite and permit employees to take frequent rest and water breaks.
- c. Use relief workers and reduce physical demands of the job.
- d. Have air-conditioned or shaded areas available for water breaks and rest periods.

**4. Health Screening and Acclimatization:**

- a. Workers should be allowed to get used to hot working environments by using a staggered approach over several days. The same should be done for workers returning from an absence of three or more days. For example, begin work with 50% of the normal workload and time spent in the hot environment, and then gradually increase the time over a 5-day period.
- b. Workers should be made aware of the following:
  - 1. Medications such as the following can increase risk of heat stress:
    - Diuretics – water pills

- Antihypertensives – blood pressure medication
- Anticholinergics – for treatment of chronic obstructive pulmonary disease (COPD)
- Antihistamines – allergy medications

2. Dangers of using drugs and alcohol in hot work environments.
3. Some conditions, such as pregnancy, fever, gastrointestinal illness, heart disease, and obesity, may increase the risk of heat-related illness. Workers should be advised to check with their doctors if they have any questions. (Please note: the employer is NOT entitled to know whether workers have these conditions, but only whether workers have any health conditions that limits their ability to perform their job duties. In some instances, workers with chronic conditions may need extra time to become acclimatized or may need other accommodations, such as more frequent breaks or restricted work.)
4. Workers should consult a doctor or pharmacist if they have questions about whether they are at increased risk for heat-related illness because of health conditions they have and/or medications they take.

You may voluntarily provide this Area Office with progress reports on your efforts to address these heat-related conditions in your workplace. OSHA may return to your worksite to further examine the conditions noted above.

Sincerely,

Area Director

Enclosures

## HEAT-RELATED INFORMATION LINKS

1. OSHA's Campaign to Prevent Heat Illness:  
<http://www.osha.gov/SLTC/heatillness/index.html>.
2. OSHA's Safety and Health Topics: Heat stress:  
<http://www.osha.gov/SLTC/index.html>
3. OSHA Technical Manual, Section III: Health Hazards, Chapter 4, Heat Stress:  
[https://www.osha.gov/dts/osta/otm/otm\\_iii/otm\\_iii\\_4.html](https://www.osha.gov/dts/osta/otm/otm_iii/otm_iii_4.html).
4. OSHA's Field Operations Manual (FOM):  
[https://www.osha.gov/OshDoc/Directive\\_pdf/CPL\\_02-00-148.pdf](https://www.osha.gov/OshDoc/Directive_pdf/CPL_02-00-148.pdf)
5. NIOSH Workplace Safety and Health Topics:  
<http://www.cdc.gov/niosh/topics/heatstress/>.
6. The National Oceanic and Atmospheric Administration (NOAA), National Weather Service:  
<http://www.nws.noaa.gov/om/heat/index.shtml>.
7. Current weather conditions, including the previous three day weather conditions at [www.noaa.gov](http://www.noaa.gov), information from prior dates can also be requested.
8. NIOSH Publication 86-112: Working in Hot Environments:  
<http://www.cdc.gov/NIOSH/docs/86-112/>.
9. California OSHA Heat Illness Prevention:  
<http://www.dir.ca.gov/dosh/heatillnessinfo.html>.