In fiscal year 2016 the Houston Area Offices had three suspected heat related fatalities which was fewer than the five cases we had during the summer of 2015 but still higher than past years. In addition to the fatalities, during calendar year 2016 there were 26 suspected heat related hospitalizations compared to 14 suspected heat illnesses hospitalizations the previous year. Whether the increase in hospitalizations was due to heat conditions or increased reporting can’t be determined. Last summer was deadly and working together to ensure water, rest, and shade for the workers we can prevent heat related incidents this summer.
FY 16 Houston Heat Related Fatality Narratives

- Two employees were weed eating around oil and gas equipment. At the end of the day they returned to their shop so they could go home. The employee was acting normal and was showing no signs of heat stress. When they got to the shop the worker unexplainably jumped out of the truck and took off running. After about ten to fifteen minutes they found him laying down in the sun with a rapid pulse and breathing but unresponsive. Suspected heat stroke.

- An employee was performing concrete work at a residential home. The employee had sent his nephew to the store, when the nephew returned the employee had been found unresponsive near the driveway by two air conditioning contractors working nearby. Employee was taken to the hospital where he died. Suspected heat illness.

- Decedent was cutting trees at a resident and complained about being exhausted. Worker assisted him to the truck and later found him nonresponsive. Suspected heat illness

BLS National Heat Related Days Away from Work Cases

- 2011: 4430
- 2012: 4160
- 2013: 3150
- 2014: 2630
- 2015: 2840
Heat related hospitalizations have been collected as part of the Serious Incident Report (SIR) requirements since January 2015 and there is only two summers of data available.

**FY 16 SIR Heat Related Hospitalizations**

- Employee had been welding on pipe structure for 8 to 8.5 hours. Injured worker came down off of the scaffold to cool off at the cool down area below the scaffold. He never recovered. Injured worker exhibited signs and symptoms of dehydration, hyperglycemia, and heat exhaustion.
- Laborer was picking up trash at the site. At the end of the day the employee started having cramps and not feeling well. The employee was taken into the trailer to drink water and it was determined that he be taken to the hospital. Employee was admitted and kept overnight for dehydration.
- An employee who was installing cable system was vomiting and overcome by heat.
- The employee was constructing a flatbed trailer for a heavy haul. The employee felt light headed and started cramping. Employee suffered from heat exhaustion.
- Injured worker got overheated from excessive heat and could not breathe. The injured worker was installing a drinking fountain when he became dizzy and disoriented which resulted in a heat stroke.
- Employee was handing scaffold board materials to another employee building scaffold. The injured employee reported he felt light headed, cramping and pain. He was brought into the office and given fluids to cool off. Employee reported still had discomfort. Employee was taken to the hospital for additional testing. Suspected heat illness
- The injured worker started work at 0800 and at approximately 2:30 pm injured worker became overheated and disoriented. The superintendent sat him down to cool him off and called the ambulance. Injured worker was unlashing and lashing cargo. Heat Exhaustion
• An employee was unloading sacks of potatoes at a customer's location. The employee strained his back and received medical treatments for the pain. Over the weekend, the employee felt sick and dehydrated, so his wife took him to the hospital where they admitted him overnight and gave him fluids. The employee was released the next day.

• The employee was inspecting a refrigeration compressor and did not feel well. Went to unit medical center for heat stress symptoms and was transported to the hospital. Heat Exhaustion.

• Employee was working inside the upper level of the storage warehouse and began experiencing muscle cramps while changing rollers on a conveyor belt.

• An employee, who had been working installing pipe, was climbing down a ladder and blacked out. The employee fell to the ground (approximately 8 feet). The employee was diagnosed with heat exhaustion and was taken to the hospital. The employee broke his shoulder from falling from the ladder.

• A temporary worker reported feeling dehydrated and vomiting due to heat, causing him to later self-refer himself to a hospital.

• Injured worker was disconnecting a vapor line and a cargo hose containing trichlorethylene. His knees buckled and the dock man noticed him stumbling. The dock man called for help and public ambulance service was called. Heat exhaustion.

• Warehouse worker had completed his work shift and was inside of his car, about to exit the parking lot for the day and started cramping all over his body. A management official noticed that the worker did not look good while the injured worker was sitting in his car. The manager called the ambulance and the injured worker was admitted into the hospital.

• Driver who was switching trucks to prepare to haul to another load began to feel dizzy. Other employees observed this and informed the boss who took the affected employee to the hospital. He was admitted to the hospital where he was treated for severe dehydration.

• The injured worker was feeling faint and fell from the second ladder rung from the bottom of the ladder. The injured worker was coming down the ladder when he fell and hit his head. Dehydration.

• An employee was in the hatch of a maritime vessel attempting to hook up to a bundle of pipe to lift it out of the hatch. Employee complained about severe body cramps. Employee was taken to the hospital and diagnosed with severe dehydration.

• Injured worker was delivering mail and started cramping on his mail route. Injured worker continued on his route even though he was cramping. Injured worker returned to the station with another worker who was also on the injured worker's route. The injured worker stayed in the vehicle while the other worker went to get a supervisor. The supervisor called 911 from his cell while at the truck with the injured worker. Heat exhaustion.

• Worker started cramping right before lunch and started grabbing his ham string, about 1:00 pm. Supervisor asked what was the problem and injured worker replied nothing. They went to lunch approximately 2:00 pm. After lunch, injured worker stated he was not feeling well. Supervisor drove injured worker to the doctor. He was seen by physician at the clinic. Doctor released injured worker to work with no restrictions. Injured worker returned to the office about 7:30 pm. Next day he did not show for work. Manager called the injured worker and was informed by significant other that he was hospitalized the previous night. Dehydration.
• Employee was driving a delivery truck and started to feel ill. Employee called supervision to report his illness. 911 was called an ambulance met employee at his location and employee was brought to hospital. Employee suffered from heat stress.

• Employee was standing at the computer desk, passed out, and his head hit the floor. He fainted and came back around. He was verifying items on the computer at the desk, doing quality assurance. Dehydration.

• Employee just finished a service call at a customer's home and was on his way to the next job when he called the supervisor to tell him about cramping. Injured worker drove himself to the hospital. Dehydration.

• Technician was installing a satellite dish on the roof of a customer's house. Technician began getting cramps at which point he contacted his manager who went to the job site and gave water and Gatorade while the technician sat in air conditioning. He initially refused treatment, but his manager took him to the hospital for heat exhaustion.

• The injured worker's body temperature increased to 105 degrees. He was outside collecting waste material and collecting trash at a residential address. Heat Exhaustion.

• Employee had been driving forklift in the warehouse unloading empty containers from a truck trailer on the loading dock. Employee walked adjacent to forklift and container storage and passed out striking his head on the floor. When he came to, he walked around and said he was all right, just had a bump on his head and was dehydrated. Employee was transported to emergency room in an abundance of caution. Heat stress.

• Injured worker collapsed while making deliveries at a resident and was hospitalized. The injured worker collapsed due to environmental heat temperatures and hit her head on the ground resulting in internal bleeding on the brain.

Heat related incidents may result in citation under the 5(a)(1) General Duty Clause which says that each employer shall furnish to each of his employees employment and a place of employment which are free from recognized hazards that are causing or are likely to cause death or serious physical harm to his employees.

A typical 5(a)(1) citation taken from citations previously issued read:

OSHACT of 1970 Section (5)(a)(1): The employer does not furnish to each of his employees employment and a place of employment which are free from the recognized hazards that were causing or likely to cause death or serious physical harm to employees in that employees performing recycling tasks during elevated heat conditions were exposed to excessive heat:

This violation occurred on or about June 24, 2015, at the facility where an employee was exposed to excessive heat conditions when performing recycling tasks such as, but not limited to, placing aluminum cans into a self-dumping hopper in an outdoor environment. Pursuant to 29 C.F. R. 1903.19, within ten (10) calendar days of the abatement date, the employer must submit documentation describing the steps that it is taking to ensure that employees are protected from excessive heat conditions.

Among feasible methods to correct the identified hazard, one method would be to establish a heat stress management program which incorporates guidelines from the American Conference of
Governmental Industrial Hygienist (ACGIH) threshold limit values and biological exposure indices; the National Institute of Occupational Safety & Health (NIOSH) document on "Working in Hot Environments;" and OSHA's Safety and Health Topics on Occupational Heat Exposure. Such a program may include, but is not limited to, the following:

- Acclimatizing employees beginning work in a hot environment or those returning from an absence period of three or more days.
- Implementing a work/rest regimen that includes a provision to allow employees to become acclimatized to extreme heat conditions.
- Providing a training program for all employees, including temporary employees, day laborers, and part-time employees regarding the health effects associated with heat stress and recognizing symptoms and methods of prevention for heat-induced illnesses.
- Providing specific procedures to be followed for emergency situations and procedures for first aid to be administered immediately to employees displaying symptoms of injury or illness.
- Using dermal patches for monitoring core temperature to better identify when workers need to be removed from the work area.
- Providing cool water and encouraging employees to drink 5-7 ounces of water every 10 to 15 minutes.
- Providing shaded areas where heat-affected employees may take their breaks and/or recover.

Figure 4-1. Examples of heat-related illness risk factors
Preventing heat related illnesses involves many factors to consider besides the heat. The above picture was taken from ‘Excerpts from Criteria for a Recommended Standard Occupational Exposure to Heat and Hot Environments’ Department of Health and Human Services/CDC/NIOSH Revised Criteria 2016. This document along with the OSHA Guide to the Heat Index provides a lot of background information on preventing heat illness. The documents can be found on their respective websites (links below)

The OSHA and other websites provide a lot of information to assist in developing your heat illness prevention program including a heat index app which will calculate the heat index and provide recommendations to protect workers.

OSHA Heat Illness webpage has lots of resources for developing your heat illness prevention plan and employee training

https://www.osha.gov/SLTC/heatillness/index.html

The OSHA Heat Safety Tool App can help monitor heat index conditions and recommend safe practices

https://www.osha.gov/SLTC/heatillness/heat_index/heat_app.html

Other Resources

- OSHA Safety and Health Topics Page

- CDC/NIOSH Heat Stress Page
  http://www.cdc.gov/niosh/topics/heatstress/

- GA OSHCON Heat
  http://www.oshainfo.gatech.edu/ergo_heatstress.html

- TX OSHCON Heat

- Army Urine Chart
DISCLAIMER: These links were compiled by an OSHA Compliance Assistance Specialist and is intended to assist employers, workers, and others as they strive to improve workplace health and safety. While we attempt to thoroughly address specific topics [or hazards], it is not possible to include discussion of everything necessary to ensure a healthy and safe working environment in a presentation of this nature. Thus, this information must be understood as a tool for addressing workplace hazards, rather than an exhaustive statement of an employer’s legal obligations, which are defined by statute, regulations, and standards. Likewise, to the extent that this information references practices or procedures that may enhance health or safety, but which are not required by a statute, regulation, or standard, it cannot, and does not, create additional legal obligations. Finally, over time, OSHA may modify rules and interpretations in light of new technology, information, or circumstances; to keep apprised of such developments, or to review information on a wide range of occupational safety and health topics, you can visit OSHA’s website at www.osha.gov. Fatalities and Catastrophes are logged or recorded in various mediums and reports generated using various criteria. Late reporting, natural causes which may have generated an initial report, fatalities transferred to other jurisdictions, and other factors may affect the overall numbers over time. Houston specific data is edited to determine a count of fatalities/catastrophes under OSHA jurisdiction and may change over time as records are updated. SIR reports were edited to exclude cases such as natural causes, epilepsy cases, automobile accidents as best as possible. Narratives are rewritten for brevity and edited and may not reflect the final results of an investigation. Data in many cases is used ‘as is’. The numbers and information are for accident prevention purposes and trending and is not intended to be a statistical study or evaluation. For questions you can contact Jim Shelton, CAS, Houston North Area Office, shelton.james@dol.gov