

# Safety Newsletter

## June, 2014

### This Month's Topic: Occupational Heat Exposure

**P**eople who work outdoors are more likely to become dehydrated and are more likely to get heat-related illness.

Heat-related deaths and illness are preventable yet annually many people succumb to extreme heat. Historically, from 1999-2010, excessive heat exposure caused 7,415 deaths (618 per year) associated with exposure to excessive natural heat in the United States.

#### *The Hazards of Excessive Heat*

When a person works in a hot environment, the body must get rid of excess heat to maintain a stable internal temperature. It does this mainly through circulating blood to the skin and through sweating.

When the air temperature is close to or warmer than normal body temperature, cooling of the body becomes more difficult. Blood circulated to the skin cannot lose its heat. Sweating then becomes the main way the body cools off. But sweating is effective only if the humidity level is low enough to allow evaporation and if the fluids and salts that are lost are adequately replaced.

If the body cannot get rid of excess heat, it will store it. When this happens, the body's core temperature rises and the heart rate increases. As the body continues to store heat, the person begins to lose concentration and has difficulty focusing on a task, may become irritable or sick, and often loses the desire to drink. The next stage is most often fainting and even death if the person is not cooled down.

#### *Why is heat a hazard to workers?*

Workers exposed to hot indoor environments or hot and humid conditions outdoors are at risk of heat-related illness, especially those doing heavy work tasks or using bulky protective clothing and equipment. Outdoor operations conducted in hot weather, such as construction and site activities, especially those that require workers to wear semipermeable or impermeable protective clothing, are also likely to cause heat stress among exposed workers. Some workers might be at greater risk than others if they have not built up a tolerance to hot conditions, or if they have certain health conditions.

The human body tries to reduce the strain from excessive heat by sweating and increasing blood flow to the skin to promote cooling. Heat-related illnesses occur when heat exposure or physical exertion increases to the point at which the body's attempts to cool itself are no longer effective.

If the problem isn't addressed, heat cramps (caused by loss of salt from heavy sweating) can lead to heat exhaustion (caused by dehydration), which can progress to heatstroke which is life-threatening.

Factors or conditions that can make some people more susceptible to heat-related illnesses include age (older adults and young children), obesity, fever, heart disease, mental illness, poor circulation, prescription drug and alcohol use, and sunburn. Sunburn, caused by ultraviolet radiation from the sun, can significantly retard the skin's ability to shed excess heat.

#### Alisto Engineering 2014 Safety Statistics

Motor Vehicle Accidents/ Total Miles Driven (01/01/14 – 04/30/14)	Lost Work Days/ Total Work Days (01/01/14 – 04/30/14)	Occupational Injuries and Illnesses (01/01/14 – 04/30/14)
0/ 73,683 miles	0 days*/ 82 days	0*

\* From BC Environmental Insurance

#### Heat Related Illnesses

**Heat stroke**, the most serious form of heat-related illness, happens when the body becomes unable to regulate its core temperature. Sweating stops and the body can no longer rid itself of excess heat. Signs include confusion, loss of consciousness, and seizures. "Heat stroke is a medical emergency that may result in death! Call 911 immediately.

**Heat exhaustion** is the body's response to loss of water and salt from heavy sweating. Signs include headache, nausea, dizziness, weakness, irritability, thirst, and heavy sweating.



**Heat cramps** are caused by the loss of body salts and fluid during sweating. Low salt levels in muscles cause painful cramps. Tired muscles—those used for performing the work—are usually the ones most affected by cramps. Cramps may occur during or after working hours.

**Heat rash**, also known as prickly heat, is skin irritation caused by sweat that does not evaporate from the skin. Heat rash is the most common problem in hot work environments.

*"During the hot summer months, start your work day by reviewing Alisto's Heat Stress Prevention Plan and discussing it during tailgate meetings. Report serious heat-related symptoms and make emergency calls for life-threatening symptoms."*

Barry Hamidou, P.G.  
Project Geologist  
Alisto Engineering Group, Inc.

# Safety Newsletter

## June, 2014

### This Month's Topic: Occupational Heat Exposure

#### Best Practices and Warnings

In warm or hot weather, try to:

- Schedule slower paced, less physically demanding work during the hot parts of the day and the heaviest work activities during the cooler parts of the day (early-morning or evening)
- Split-up work shifts to avoid work during the hottest part of the day
- Start the work shift even earlier in the day or later in the evening
- Avoid over time work and double shifts
- Postpone non-essential work to be done until a later time when it is cooler
- Rotate employees through less physically demanding jobs
- Add extra personnel to reduce exposure time for each employee
- Cut work shifts short or stop work altogether

#### Workplace Emergency Procedures

If any of the serious illness symptoms listed above are present, and first aid trained personnel are not immediately available to make an assessment, immediately call 911 or transport employee to the Emergency Room. While waiting for emergency help:

- Get victim to a cool environment
- Loosen or remove excess clothing
- Provide cool drinking water if person is conscious and not nauseous
- Fan and mist the person with water
- Apply a water-soaked towel (or ice pack wrapped in a towel) to head and ice packs to the armpits

Alisto has a Weekly Heat Stress Prevention Plan to ensure the safety of Alisto Employees when working in a heat index above 100°F.

Alisto's Heat Stress Prevention Plan is based mainly on Heat Index Values. The Heat Index, sometimes referred to as the apparent temperature, is a measure of how hot it really feels when relative humidity is factored in with the actual air temperature.

																							
		<b>HEAT INDEX</b>																					
		Relative Humidity (%)																					
Temperature (F)		0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100	
	105	95	97	100	102	105	109	113	118	123	129	135	142	149									
	100	91	93	95	97	99	101	104	107	110	115	120	126	132	138	144							
	95	87	88	90	91	93	94	96	98	101	104	107	110	114	119	124	130	136					
	90	83	84	85	86	87	88	90	91	93	95	96	98	100	106	108	109	113	117	122	126		
	85	78	79	80	81	82	83	84	85	86	87	88	89	91	91	93	95	97	99	102	105	108	
	80	73	74	75	76	77	77	78	79	79	80	81	81	83	83	86	86	88	88	89	91		
75	69	69	70	71	72	72	73	73	74	74	75	75	76	76	77	77	78	78	79	79	80		
Caution - Heat stress possible with prolonged exposure and activity.																							
Extreme Caution - Moderate to Severe Heat stress possible with prolonged exposure																							
Danger - Moderate to Severe Heat stress likely.																							

#### Cal/OSHA's Regulatory Requirements for Heat Illness Prevention (Title 8 CCR 3395)

T8CCR 3395 Definitions states the following:

"Environmental risk factors for heat illness" means working conditions that create the possibility that heat illness could occur, including air temperature, relative humidity, radiant heat from the sun and other sources, conductive heat sources such as the ground, air movement, workload severity and duration, protective clothing and personal protective equipment worn by employees.

T8CCR 3395 Training states the following:

(1) Employee training. Effective training in the following topics shall be provided to each supervisory and non-supervisory employee before the employee begins work that should reasonably be anticipated to result in exposure to the risk of heat illness:

(A) The environmental and personal risk factors for heat illness, as well as the added burden of heat load on the body caused by exertion, clothing, and personal protective equipment.

#### References

1. <http://www.dir.ca.gov/dosh/etools/08-006/index.htm>
2. <https://www.osha.gov/SLTC/heatstress/>
3. [https://www.osha.gov/SLTC/heatstress/heat\\_illnesses.html](https://www.osha.gov/SLTC/heatstress/heat_illnesses.html)
4. <http://nws.noaa.gov/os/heat/index.shtm>
5. [http://www.bt.cdc.gov/disasters/extremehat/heat\\_guide.asp](http://www.bt.cdc.gov/disasters/extremehat/heat_guide.asp)
6. <http://www.nws.noaa.gov/om/heat/index.shtml>
7. <http://www.bt.cdc.gov/disasters/extremehat/faq.asp>

#### Appendices

8. Alisto Heat Index
9. Alisto Heat Stress Management Plan

#### Image Credit

10. <http://www.rhsb.com/blog/symptoms-of-heat-stroke/>