

# Safety Newsletter

## June, 2013

### This Month's Topic: Heat Cramps, Heat Exhaustion, Heat Stroke

Summer is here, which means the temperatures will continue to rise.

Excessive exposure to heat can cause a range of heat-related illnesses, from heat cramps to heat exhaustion and heat stroke. Heatstroke, the most serious of the three, can cause shock, brain damage, organ failure, and even death.

Every year, thousands of workers become sick from occupational heat exposure, some even result in death. Fortunately, these illnesses and deaths are preventable.

Alisto has an emergency plan in place that specifies what to do if a worker has signs of heat-related illness, and ensures that medical services are available if needed.

#### *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.

#### *Heat Stress Hazards*

Heat emergencies fall into three categories of increasing severity:

**Heat Cramps** are usually caused by performing hard physical labor in a hot environment. This sweating depletes the body's salt and moisture levels. Low salt levels in muscles causes painful cramps. Heat cramps may also be a symptom of heat exhaustion.

#### **Symptoms**

- Muscle pain or spasms usually in the abdomen, arms, or legs.

#### **First Aid**

Workers with heat cramps should:

- ✓ Stop all activity, and sit in a cool place.
- ✓ Drink clear juice or a sports beverage.
- ✓ Not return to strenuous work for a few hours after the cramps subside because further exertion may lead to heat exhaustion or heat stroke.

Seek medical attention if any of the following apply:

- The worker has heart problems.
- The cramps do not subside within one hour.

Factors that increase risk to workers are:

- ◆ High temperature and humidity
- ◆ Direct sun exposure (with no shade)
- ◆ Indoor exposure to other sources of radiant heat (ovens, furnaces)
- ◆ Limited air movement (no breeze)
- ◆ Low fluid consumption
- ◆ Physical exertion
- ◆ Heavy personal protective clothing and equipment
- ◆ Poor physical condition or health problems
- ◆ Pregnancy
- ◆ Advanced age (65+)
- ◆ Lack of recent exposure to hot working conditions
- ◆ Some medications, for example, different kinds of blood pressure pills or antihistamines
- ◆ Previous heat-related illness





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**Heat Exhaustion** is the body's response to an excessive loss of the water and salt, usually through excessive sweating. Workers most prone to heat exhaustion are those that are elderly, have high blood pressure, and those working in a hot environment.

#### Symptoms

- Extreme weakness or fatigue
- Dizziness, confusion
- Nausea
- Clammy, moist skin and pale or flushed complexion
- Muscle cramps
- Slightly elevated body temperature
- Fast and shallow breathing

#### First Aid

Treat a worker suffering from heat exhaustion with the following:

- Have them rest in a cool, shaded or air-conditioned area.
- Have them drink plenty of water or other cool, nonalcoholic beverages.
- Have them take a cool shower, bath, or sponge bath.

**Heat stroke** is the most serious heat-related disorder. It occurs when the body becomes unable to control its temperature: the body's temperature rises rapidly, the sweating mechanism fails, and the body is unable to cool down. When heat stroke occurs, the body temperature can rise to 106 degrees Fahrenheit or higher within 10 to 15 minutes. Heat stroke can cause death or permanent disability and requires immediate medical attention.

#### Symptoms

- Hot, dry skin or profuse sweating
- Hallucinations
- Chills
- Throbbing headache
- High body temperature
- Confusion/dizziness
- Slurred speech

#### First Aid

Take the following steps to treat a worker with heat stroke:

- ✓ Call 911 and notify their supervisor.
- ✓ Move the sick worker to a cool shaded area.
- ✓ Cool the worker using methods such as:
  - Soaking their clothes with water.
  - Spraying, sponging, or showering them with water.
  - Fanning their body.

#### Prevention – Work Practices

Ventilation, air cooling, fans, shielding, and insulation are the five major types of engineering controls used to reduce heat stress in hot work environments. Heat reduction can also be achieved by using power assists and tools that reduce the physical demands placed on a worker.

Workers should avoid exposure to extreme heat, sun exposure, and high humidity when possible. When these exposures cannot be avoided, employers and workers should take the following steps to prevent heat stress:

#### Heat Related Illness Facts

- ◆ Heat-related illness occurs as a result of heat exposure.
- ◆ Treatment for heat-related illness generally includes moving the individual out of the hot environment, implementing cooling measures as needed, rest, and rehydration.
- ◆ Heat stroke is the most severe form of heat-related illness, and requires immediate medical attention.
- ◆ According to statistics from the Centers for Disease Control and Prevention, there were 7,415 deaths due to heat-related illness in the United States from 1999 to 2010, or an average of approximately 618 deaths per year. Heat waves lead to more deaths annually in the United States than tornadoes, earthquakes, floods, and hurricanes combined.
- ◆ Prevention of heat-related illness is best accomplished through proper planning and preparation, such as increasing fluid intake, wearing appropriate clothing and sunscreen, remaining in a cool environment, acclimating yourself to the hot environment, and using common sense.

*"It is up to each of us to look out for each other in the field. If you suspect symptoms of heat stress in your coworker(s), approach the person, bring them to the shade, and administer the appropriate first aid and engineering controls. Beat the heat!"*

*-Larry Buenvenida  
Safety Officer, Alisto Engineering Group, Inc.*

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- ✓ Rotating job functions among workers can help minimize overexertion and heat exposure.
- ✓ Be aware that protective clothing or personal protective equipment may increase the risk of heat stress.
- ✓ Gradually build up to heavy work.
- ✓ Schedule heavy work during the coolest parts of day.
- ✓ Take more breaks in extreme heat and humidity.
  - Take breaks in the shade or a cool area when possible.
- ✓ Workers must have adequate potable (safe for drinking) water close to the work area, and should drink small amounts frequently.
  - Avoid alcohol, and drinks with large amounts of caffeine or sugar.
- ✓ Monitor your physical condition and that of your coworkers.

Always remember that prevention is the best way to avoid heat-related illness. Employers, field supervisors, and workers should follow the recommendations above to reduce the risk of heat-related illness in outdoor workers. Plan for an emergency and know what to do — acting quickly can save lives!

#### References

1. [http://www.osha.gov/dts/osta/otm/otm\\_iii/otm\\_iii\\_4.html](http://www.osha.gov/dts/osta/otm/otm_iii/otm_iii_4.html) (OSHA Technical Manual)
2. <http://www.cdc.gov/niosh/topics/heatstress/>
3. Alisto Heat Stress Management Plan
4. Alisto Heat Index

#### APPENDIX

		ALISTO ENGINEERING GROUP																				
		HEAT INDEX																				
		Relative Humidity (%)																				
		0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100
Temperature (F)	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	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
Heat Index		Basic (Level D) PPE and Light to Moderate Work Activity										Additional PPE and/or Moderate to Heavy Work Activity					Basic First Aid					
>100°	Heat Index > 100° requires written heat stress plan																					
	Heat Stress Watch Assigned to all jobs Drink 16 oz w water before leaving shop Baby Pool/Dunk Tub/Safety Shower on Site No Caffeine or Energy Drinks																					
	Fluids - Minimum 8 ounces - Mandatory - Every 30 Minutes Rest Breaks Mandatory - Every 30 Minutes Cool Device - Mandatory (Shade, Air Movers, Cool Vests, Cold Rag On Neck, etc..)										Fluids - Minimum 8 ounces - Mandatory - Every 15 Minutes Rest Breaks Mandatory - Every 15 Minutes Cool Device - Mandatory (Shade, Air Movers, Cool Vests, Cold Rag On Neck, etc..) Level A/B PPE - Check vitals mandatory (EMT)					Heat Stroke <b>This is dire medical emergency</b> <b>Contact EMS immediately</b> Cool any way possible - Submerge in Dunk Tub - Put Under Safety Shower - Remove clothing - Fan - Apply cold packs, wet rags, etc						
90°- 100°	No Caffeine or Energy Drinks Confined Space Temperature > 100° requires written heat stress plan																					
	Fluids - Minimum 8 ounces - Mandatory - Every 60 Minutes Rest Breaks Mandatory - Every 60 Minutes Cool Device - Mandatory (Shade, Air Movers, Cool Vests, Cold Rag On Neck, etc..)										Fluids - Minimum 8 ounces - Mandatory - Every 30 Minutes Rest Breaks Mandatory - Every 30 Minutes Cool Device - Mandatory (Shade, Air Movers, Cool Vests, Cold Rag On Neck, etc..)					Heat Exhaustion Move to cool place Loosen Clothing Use fans Cold Pack-Back of Neck Drink Water Contact EMS if no improvement in 5 min.						
80°-90°	Fluids - Minimum 8 ounces - Mandatory - Every 60 Minutes Rest Breaks - Self Pace Cool Device - Recommended										Fluids - Minimum 8 ounces - Mandatory - Every 30 Minutes Rest Breaks Mandatory - Every 60 Minutes Cool Device - Recommended					Heat Cramps Rest in cool place Drink Fluids - Mn. 8 ounces/15 minutes						
<b>Caution</b> - Heat stress possible with prolonged exposure and activity.																						
<b>Extreme Caution</b> - Moderate to Severe Heat stress possible with prolonged exposure																						
<b>Danger</b> - Moderate to Severe Heat stress likely.																						


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## WEEKLY HEAT STRESS PREVENTION PLAN

**Location:** \_\_\_\_\_ **Client:** \_\_\_\_\_ **Week Of:** \_\_\_\_\_

### **OBJECTIVE:**

To ensure the safety of Alisto Employees when working in High Temperature

### **PLAN ENGAGEMENT & DOCUMENTATION:**

This plan is to be completed whenever employees are working in a Heat Index above 100<sup>0</sup> F. The plan will be reviewed, approved and signed by the Site Safety Officer and will remain onsite for the duration of the job. Project Health and Safety Officer and Project Management must be consulted if the Heat Index rises above 110<sup>0</sup> F. The Heat Stress plan will be reviewed by all site personnel prior to commencing work. Once the job is completed the original will remain with the job logs and a copy will be filed at the Location.

### **DEFINITIONS:**

Engineering Controls –

Equipment used to cool the work space (i.e. Chillers, Air Conditioners, Copus Blowers, Vent Fans, Air Horns, etc.)

Administrative Controls –

Defined work / Rest periods

Additional personnel for work rotation and more frequent breaks

Available Hydration (i.e. water, Gatorade, etc.)- Workers should drink at a minimum 1 quart / per hour starting approx. 1 hour before engaging in heat related activities.

Personal Protective Equipment (PPE) – Clothing which will help keep the Core Body Temperature below 100.4<sup>0</sup> F (i.e. Air Cooled Suits, Cool Vests, Water Cooled Vests, Reflective Suits, Cool Bandanas, etc.).

**ACTION PLAN:**

Temperature will be monitored continuously and documented at beginning and mid-shift for the duration of Job (See attached matrix).

The following **Controls** will be used during the \_\_\_\_\_ job.  
(Job Name)

- Engineering Controls (make space cooler and or provide shade)
- Administrative Controls (work/rest & rotation of employees)
- PPE (wearing equipment to keep body cool)

Define how the Controls will be utilized.

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What type of **Hydration** is available on site and where is it located?

Workers should drink at a minimum 1 Quart (32 ounces) / per hour starting approx. 1 hour before engaging in heat related activities.

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List any new employees on site that are **Not Acclimated** to the Heat.

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What precautions will Alisto take to **Help Acclimate** them to the Heat?

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**PPE must be Evaluated as a Hazard on the JSA (i.e. Tyvek, Breathing Air, Nomex, etc.).**

\_\_\_\_\_  
Site Supervisor

\_\_\_\_\_  
Site Safety Officer

\_\_\_\_\_  
Heat Stress Watch

# TEMPERATURE MONITORING MATRIX

**Location:** \_\_\_\_\_ **Client:** \_\_\_\_\_ **Week Of:** \_\_\_\_\_

**Site Supervisor:** \_\_\_\_\_ **Heat Stress Watch:** \_\_\_\_\_

**Instructions:** List results at beginning and mid shift – adjust plan as necessary.

Day	Job Site	Temp	Humidity	Heat Index	Signature
Monday – Beginning					
Monday – Mid Shift					
Tuesday – Beginning					
Tuesday – Mid Shift					
Wednesday- Beginning					
Wednesday- Mid Shift					
Thursday- Beginning					
Thursday- Mid Shift					
Friday – Beginning					
Friday - Mid Shift					
Saturday – Beginning					
Saturday – Mid Shift					
Sunday – Beginning					
Sunday – Mid Shift					

**Supervisor Signature:** \_\_\_\_\_

**File at location when complete.**