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## SUBJECT: 06/14/2024 – Heat Related Episode Due to Dehydration

**PRE-EVENT:** A KCG employee was working with a crew installing gussets on piers in a greenfield site in a rural area. This was his 1<sup>st</sup> full day on this site. The weather was sunny, 82°F, a heat index of 84.6°F, wind speed of 14 mph at 11:00 am. On the morning of the incident, the effected employee stopped at a gas station to use the restroom and purchase a bottle of water and a breakfast sandwich. He arrived at the site, participated in the JSA, and started working. He would urinate once more at the jobsite around mid-morning. He described the color of his urine to be darker than usual. He estimates that over the course of the morning that he drank six 12 oz bottles of water during periodic breaks that were taken between concrete trucks arrival on site.

**EVENT:** The effected employee started experiencing cramps and felt nauseous around 11:00 am. He reported his symptoms to his superintendent, and he was moved to an air-conditioned truck to drink more water along with pickle juice and some Powerade. While sitting in the truck, his cramps continued to spread from his legs to his feet, arms, hands, and neck. By 12:30 pm the decision was made to transport him to a local clinic. While in the waiting room at the clinic, he vomited, and the staff called for an ambulance. He was treated by Emergency Medical Services and transported to a nearby emergency room where he was released around 6:00 pm.

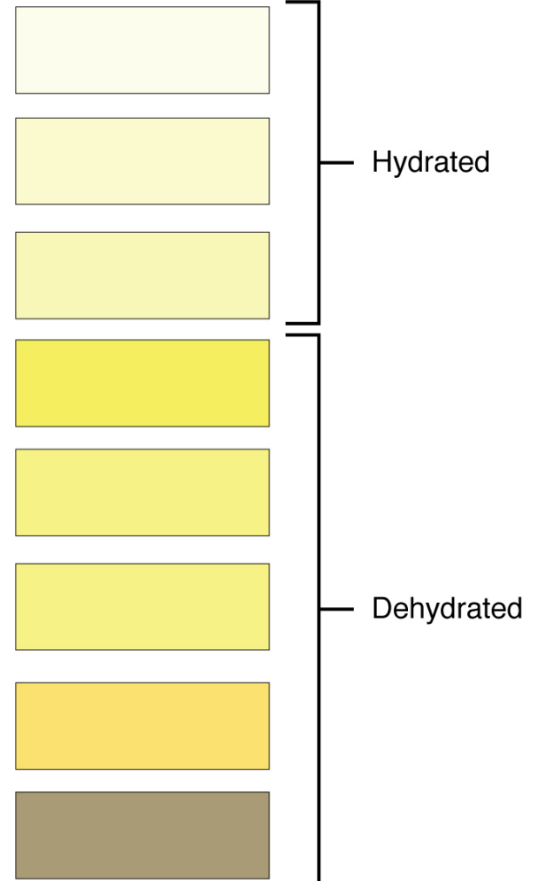
### WHAT WENT RIGHT:

1. The effected employee was present for the JSA.
2. Heat Stress, Dehydration, and Take plenty of breaks/ Stay Hydrated were all documented on the JSA.
3. The 5-day average high temperature in the area leading up to the day of the incident was only 80°F.
4. The Superintendent had the employee stop working and move to a cool environment to rest and drink fluids.
5. The project team followed the Event Reporting Protocol and rendered on site first aid, eventually transporting the effected employee to a medical facility.

### CONTRIBUTING FACTORS:

1. This was the effected employee's 1<sup>st</sup> full day on this project. He was in training two days prior to the incident and the day before, he traveled several hours to the site and only worked part of the day. During this two-day period of little to no exposure to the heat he admittedly drank very little water.
2. The morning of the incident, the effected employee's urine was darker than usual, indicating that he was most likely dehydrated before arriving at the site. There was no communication of this symptom to anyone on site.
3. The effected employee consumed an estimated 84 fluid ounces of conventional water prior to the onset of cramping, possibly contributing to an electrolyte imbalance. This electrolyte imbalance can cause muscles to tighten and cramping to intensify. Regardless of the volume of water consumed that day, it wouldn't be enough to overcome the fact that the worker arrived at work dehydrated.

## URINE COLOR CHART



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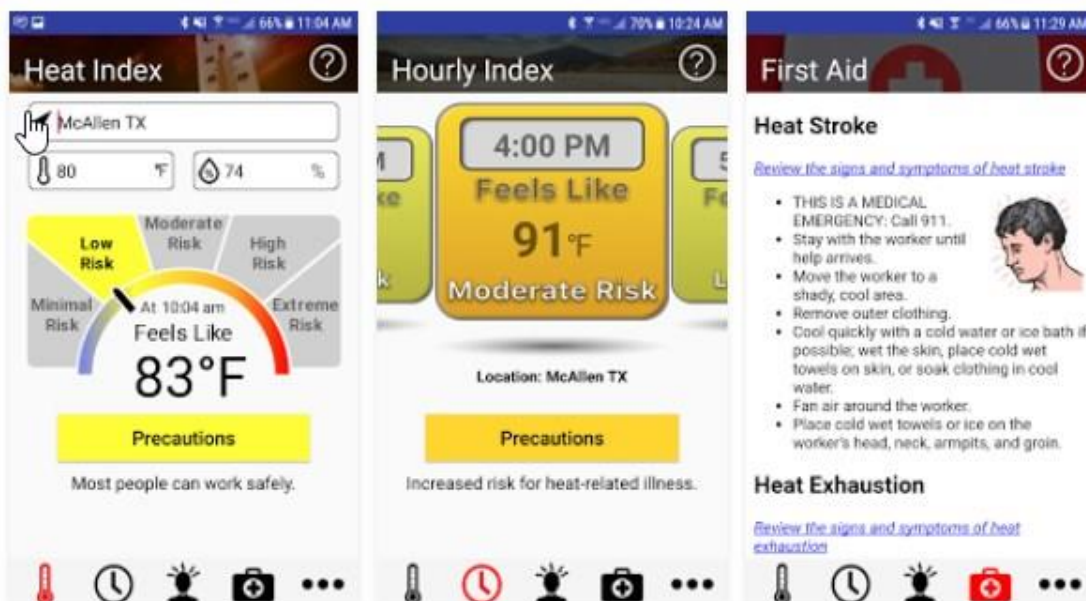
## PRELIMINARY PROCESS IMPROVEMENT SUGGESTIONS / PROTOCOL ADHERENCE REQUIRED:

- Employees who work in hot environments need to be coached on how to recognize the signs and symptoms of dehydration. Urine color is a key indicator of someone's level of hydration. (See example on Page 1). Some vitamins and supplements can cause urine to appear discolored for a few hours.
- Any employee who recognizes any signs of dehydration should report that to their superintendent immediately. A dehydrated employee may need additional breaks and their fluid and electrolyte intake should be monitored.
- Acclimatization is the process of building a tolerance to when starting work in a hot environment. When an employee is acclimatizing, additional breaks and fluid intake might be needed along with rotating between strenuous and non-strenuous tasks.
- Employees should be provided with shaded areas to work in if possible and if not possible, shaded break areas. Exposure to direct sunlight can increase the heat index by up to 15°F.
- Employees should take precautions at home to prepare themselves for working in hot environments. This can include:
  - Start hydrating 48 hours prior to working in hot environments with water, sports drinks, or electrolyte solutions.
  - Avoid drinking coffee, tea, caffeinated beverages, and energy drinks before working in hot environments.
  - Avoid alcohol for 24-48 hours before working in hot environments.
  - Eat food that is high in water content such as fruits and vegetables.
  - Avoid nicotine as it can increase your potential to be dehydrated.
  - Wear sunscreen or sun protective clothing (UPF 50 fabric, hard hat visors, etc.).
- Monitor the heat index for your site. The OSHA-NIOSH Heat Safety Tool is a free downloadable application available for both iPhone and Android devices. It will display the current heat index, hourly forecast, along with symptoms of heat related illnesses and first aid treatment (See example on Page 3).



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7. Know the signs and symptoms of heat related illnesses.
  - **Heat Cramps** – Mildest form of heat illness. Consists of painful muscle cramps and spasms that occur during or after intense exercise and sweating in high heat. Signs and symptoms include painful cramps, especially in the legs; Flushed, moist skin.
  - **Heat Exhaustion** - Heat exhaustion is more severe than heat cramps and results from a loss of water and salt in the body. It occurs in conditions of extreme heat and excessive sweating without adequate fluid and salt replacement. Heat exhaustion occurs when the body is unable to cool itself properly and, if left untreated, can progress to heat stroke. Signs and symptoms include muscle cramps, cool pale moist skin, usually a fever over 100.4° F, nausea, vomiting, diarrhea, headache, fatigue, weakness, anxiety and faint feeling.
  - **Heat Stroke** - Heat stroke, the most severe form of heat illness, occurs when the body's heat-regulating system is overwhelmed by excessive heat. It is a life-threatening emergency and requires immediate medical attention. Signs and symptoms include Red, hot, dry skin; high fever, usually over 104° F; rapid heart rate; loss of appetite; nausea; vomiting; headache; fatigue; confusion; agitation; lethargy; stupor; seizures, coma, and death is possible.
8. Hydrate during work. Drink water before feeling thirsty. By the time you are thirsty, you are already behind in fluid replacement. When working in heat, drink 1 cup (8 ounces) of water every 15-20 minutes. Drinking water at shorter intervals is more effective than drinking large amounts infrequently. Replenish electrolytes as needed, but don't exceed one electrolyte solution for every four servings of water.
9. Utilize the Keeley Event Reporting Protocol. As soon as you or someone on your crew begins feeling the effects of heat illness, follow the protocol and report as soon as possible so that the appropriate resources are made available in a timely manner.



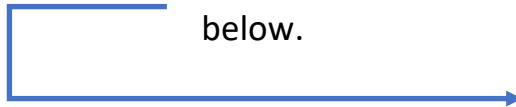
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**Communication and Documentation Expectation: Please review with all crew/team members.**

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Or follow the link below.



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