Event Type: Carbon Monoxide Poisoning

Date: October 22, 2019

Location: Cow Creek Fire, Colorado

Narrative

On October 22, 2019, at approximately 0645, an employee assigned to the ICP Medical Unit was involved in a medical incident. Initial reports indicated the patient had been sleeping in the heated Medical Unit yurt and awoke with severe headache, nausea and vomiting. The patient was transported to the hospital and was released the same day.

Upon inspecting the heating unit and venting configuration, it was determined that inadequate exhaust/intake circulation was the most likely cause.

The incident Facilities Unit had originally planned to use large commercial generators and electric HVAC (Heating, Venting and Air Conditioning) units to provide heat to cache-supplied yurts. However, the required generators were not available. Instead, a contractor at a nearby fire was contracted to set up their yurts and electric HVAC units.

One of the contracted HVAC units failed (providing heat for the Medical Unit yurt) and could not be repaired. The contractor replaced this inoperable electric HVAC unit with a diesel-powered heating unit. The diesel-powered heating unit was reported producing black soot from the exhaust pipe. The contractor attempted to adjust the unit for the correct altitude.

The diesel-powered heating unit was set up adjacent to a building with an overhanging roof which, combined with cold air, likely allowed the exhaust to cycle into the yurt through the air intake. In addition, black soot was reported found inside the yurt during the morning of the medical incident. Inadequate exhaust/intake circulation and an incorrectly adjusted heating unit likely caused carbon monoxide to enter the yurt (see photos below).

The photos on this page and the next show a reenactment where the heating unit was set up. Note the nearby overhanging roofline.

The photo on right shows a heating unit with an extended exhaust stack that may work better to dissipate harmful emissions.

Recommendations

- All yurts requiring generator electricity, gasoline/diesel and propane powered heating units should have CO detectors, smoke alarms and fire extinguishers installed prior to occupancy.
- CO detectors should be included with cache yurts as part of the kit, or work with the Buying Team to purchase CO detectors.
- Contracting Officers should consider requiring CO detectors, smoke alarms and fire extinguishers in the contract for yurts, mobile office trailers, and other trailers that will be used as work stations.
- Avoid sleeping in vehicles while the engine is idling. Do not set up tents or yurts near generators and heaters powered by gasoline, diesel or propane.
- Consider taller exhaust systems on generators and heating units to better disperse harmful gases.

- Perform a thorough initial inspection of generators and heating units to ensure exhaust systems are properly installed and functional.
- Verify heating units are properly calibrated for altitude. Proper calibration will still produce CO.
- Avoid using gasoline, diesel and propane powered heating units when electric HVAC units are available.
- Diesel, gasoline and propane powered generators and heating units should be set up to allow adequate exhaust and air intake per the manufacturer's recommendations.
- Avoid placing generators and heating units near windows and doors.
- Allow personnel to sleep inside buildings or find alternate work stations and sleeping areas in cold temperatures.

This RLS was submitted by: Incident Overhead

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