Rapid Lesson Sharing

Event Type: ICP Carbon Monoxide Exposure

Date: September 10, 2018

Location: North Fire, Tahoe National Forest, California

"Each day I spent the full day in camp, I got a pounding headache. In the woods, I felt great."

IMT Member

Purpose

This RLS is intended to share information on: 1) The use and placement of portable generators within incident base camps; and 2) The impacts of Carbon Monoxide (CO) to incident personnel.

CO is a common industrial hazard resulting from the incomplete burning of diesel or gasoline. This is one of the most common sources of CO exposure in the workplace from internal combustion engines.

Background

During the first six days of the North Fire incident there was a common complaint from personnel of headaches, nausea, and a general sense of tiredness. Through dialogue between incident personnel, Safety and Operations began to question the possibility that CO gas was entering the trailers and tents in camp.

It was also noticed that generators were placed in close proximity to these structures. Through research and discussion, it was determined that there was a high likelihood that personnel were being exposed to elevated levels of CO gas. The Incident Commander directed Logistics to have the vendor relocate generators to a greater distance away from structures.

One of the six generators used at the North Fire ICP. Note that this unit was placed less than five feet from the RV trailer.

Narrative

The North Fire on the Tahoe National Forest escaped initial attack in early September and an IMT was ordered. The Northern California IMT 1 assumed command of the North Fire on September 4.

The Incident Command Post was set up at the Blue Canyon-Nyack Airport, located four miles southwest of Emigrant Gap, California. The camp was positioned along the runway with tents placed parallel to the trailers on the east side.

Generator Exhaust Becomes Suspect

Generators were placed within 5-10 feet of structures (as seen in Diagram 1 on right) and window style air conditioner units were placed in the windows of the tents. The AC units on the trailers were mounted near the roof of each trailer.

AC units draw air from the outside, pass that air through a condenser, and blow into the structure to which it is attached. Thus, pollutants or gases could be passed through the unit and into workspaces.

Over the course of several days, numerous personnel were complaining of headaches, nausea, and abnormal fatigue.

This is consistent with the symptoms of Carbon Monoxide (CO) poisoning (dizziness, headaches, nausea, tiredness).

"I don't get headaches. This was the worst headache I've ever had."

Command and General Staff Member

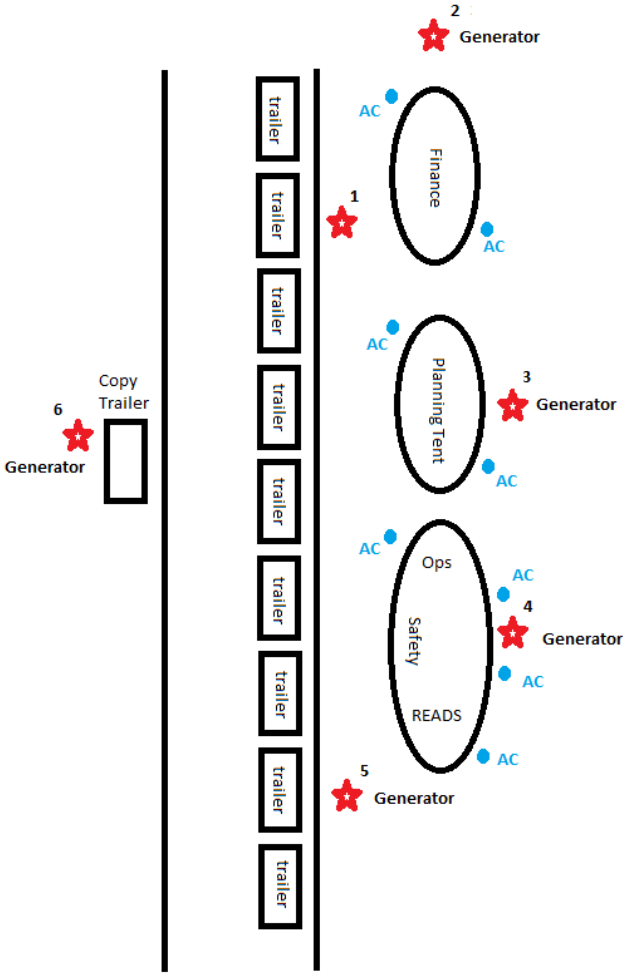

Diagram 1

On the sixth day of the team's assignment, Safety briefed the IC, suspecting that the generator's exhaust was the possible cause and indicating that they should be moved.

After this subject was discussed with the team, additional personnel came forward indicating that they had also felt the effects that could have been caused by CO gas.

Signs and Symptoms

Through casual conversation it was found that several team members were experiencing similar symptoms. Many mentioned severe headaches, fatigue, and in one example, nausea and vomiting.

Through several accounts, symptoms were alleviated by leaving their common work areas within the ICP, either for the fireline or other locations.

IMT Response

Through discussions between the Command and General Staff, it was decided to move all potential sources of exhaust farther away from the trailers and tents of camp. Although no CO monitors were immediately available to verify the exposure, within one shift of this precautionary effort, symptoms were relieved.

"I was just exhausted, so tired. I noticed I was having a hard time focusing. I struggled to focus on small tasks, details."

"I felt better after a walk around in fresh air."

IMT Members

Conclusion

Throughout long and difficult fire seasons responders become accustomed to fatigue but still need to perform. As the season wears on and fatigue combines with illness and other cumulative factors, additional illnesses and exposures can be overlooked. Caution needs to be exercised to look at various outside contributing factors to all ailments.

The layout of the ICP needs to take into account not only traffic areas, sleeping arrangements and work areas, it also needs to address and be mindful of the potential sources of exhaust and CO created by generators and power equipment.

As we establish camps in remote locations, generators have become necessary equipment to accomplish all of the tasks assigned to an IMT. The hidden danger of CO poisoning should always be considered.

Coworkers, team members and all incident personnel need to monitor one another for this exposure. Incident Command Posts are not without hazards. CO, being both odorless and colorless, is a by-product we will encounter daily.

Recommendations

- ✓ Explore the need for CO monitors in work tents and trailers.
- ✓ During camp set up, consider the distances between generators and occupied structures.
- ✓ Remain vigilant as to signs and symptoms. When you or a coworker are experiencing unusal health concerns, dicsuss this with the Medical Unit Leader. Attempt to discover the underlying contributing issue. Working through the problem is preferred to having a serious medical event.

Web Links for More Information

https://www.cpsc.gov/s3fs-public/Portable_Generator_Safety_Alert_2017_5123.pdf?5zYC5oSH8WSNeBNsFMGm1L0J0.s1W07a

https://www.nist.gov/news-events/news/2009/10/safer-emergencies-give-your-power-generator-some-space

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