Workplace Safety
ACADEMY



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Tips for Safely Handling Fuel

How to mitigate the risk of smoke/fume inhalation and fires when using fuel on job sites

by Mark Lamendola

Sometimes, it is necessary to have fuel (typically gasoline or kerosene) on the job site. Maybe you need to perform cable testing and other maintenance related to a specific service and switchgear from which the lights and receptacles in that work area are fed, so you need a generator for light and power. Or maybe it's a green site, and the temporary power from the pole isn't sufficient for this particular job.

The main caution is to think ahead. What does this mean? Consider the case of a crew whose job it was to conduct maintenance on a service and in four feeder panels. These were located near an overhead door. There was both outdoor work and indoor work, and it was all being done between 7 p.m. and 5 a.m., which meant no sunlight. The crew had pole-mounted lights outside and stand-mounted lights inside.

The lights and several power cords were supplied power from a portable panel that was connected to a portable generator that used gasoline for fuel. The crew member responsible for setting up the generator put it indoors to reduce the noise for the outdoor work, which would be done first.

Fortunately, the crew leader thought ahead. At the job briefing, he questioned how they would work inside once it filled up with exhaust fumes. Upon noticing the

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fuel can sitting right next to the generator, he also said he did not want refueling to take place inside. So the generator was rolled outside. They rigged a makeshift sound barrier with some plywood and two pickup trucks, and it worked well enough for what little work they had to do outside.

If you think about what all could have gone wrong with a heat source (the generator's engine), ignition sources (breakers), and fuel (especially if spilled) indoors, there was plenty of potential for disaster. If there had been combustibles present, that would have been yet another risk factor.

They had no safety checklist or rule book for siting and using their generator set-up. The crew leader simply thought ahead. The key to thinking ahead is to mentally walk through all the major phases of what you are doing and consider the possible safety risks.

Some basic rules:

- Use the correct container for the fuel in question. Gasoline containers are red while kerosene containers are blue.
- Use only fuel containers that comply with OSHA regulations. Such a container is called a "safety can." 29 CFR 1926.155 (l) defines a safety can as "…an approved closed container, of not more than 5 gallons capacity, having a flash arresting screen, spring-closing lid and spout cover and so designed that it will safely relieve internal pressure when subjected to fire exposure."
- Find a place where you can set fuel containers safely away from ignition sources and heat sources. Also keep them away from vehicular traffic and expected foot traffic.
- Have a spill clean-up plan in place before bringing fuel to the generator. You will need a spill clean-up kit and a means of safely disposing of items soaked in fuel. But if you're using a safety can, then a "spill" is almost always very minor and easily wiped up with a shop rag. So your spill clean-up kit could just be a couple of shop towels to at least have something.
- Perform refueling where it poses the least risk in case of a spill. That could mean disconnecting a generator and moving it several yards away from where you need it to sit, then rolling it back.
- Never refuel while near a floor drain. This could create an environmental problem, and even worse it could mean a line of fuel running under the floor with fumes coming back up through the drain.
- It's often difficult to see how much space is remaining in a small engine fuel tank while you are pouring. This results in fuel being spilled outside the tank, albeit with a safety can it typically is not much. Visually estimate before starting, and don't try to totally fill it up. Err on the side of not quite full.
- Avoid refueling while hot. If your generator ran out of gas, take a 15 minute break so it can cool a bit before heading over to it with the gas can.
- Clean up spills right away.
- Obviously, there should be no smoking or vaping during fuel handling. But that rule also applies to any time the fuel containers are present — you just don't want the extra risk.
- If you smell fuel at any time, stop work. There should be no smell of fuel. Is there a leak at the generator? Did someone kick over a fuel can? Where is that smell coming from, and can we find the source in time to avoid ignition?
- Never use that fuel to start a fire. There is no safe way to start a fire using gasoline. One risk is the flame will follow the fumes back to the container and cause a flash. If you have some reason to start a fire, close the fuel container and move it upwind from the intended fire site.

What PPE is recommended? Eye protection is already covered because if you are in the field, then you are wearing safety glasses. This part is cover3ed.

We typically don't wear special gloves or respirators when fueling our cars or lawn equipment, and those PPE are typically not necessary for fueling your generator or other construction equipment. Of course, that does mean be careful not to slop gas on yourself, and don't put your face right over the fill spout. If you get gasoline or hexane on your skin, rinse it off as soon as possible with cool water. Or just wear those typically not necessary gloves to protect your hands; nobody is 100% klutz-free all the time.

Ventilation needs to be adequate not only to limit the buildup of combustible fumes but also because the benzene, hexane, and toluene present in both gasoline and kerosene are powerful carcinogens. As with most nasty chemicals, reducing the concentration is a good defense strategy. An overpowering stench of kerosene



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is obviously not good. With adequate ventilation, you catch just a hint of it.

Assuming you're not a total klutz with a fueling can, fire is the primary danger with using either of these fuels to power generators and other equipment in the field. Keep the fire triangle in mind. It consists of fuel (which you are handling and temporarily storing in your immediate vicinity), oxygen, and an ignition source. You can't really get rid of the oxygen, but you can take easy, practical measures to prevent the fuel and an ignition source from coming together.

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Prior to starting his own business, Mark served as the Technical Editor on EC&M *for six years, worked three years in nuclear maintenance, six years as a contract project engineer/project manager, three years as a systems engineer, and three years in plant maintenance management.*

Mark earned an AAS degree from Rock Valley College, a BSEET from Columbia Pacific University, and an MBA from Lake Erie College. He's also completed several related certifications over the years and even was formerly licensed as a Master Electrician. He is a Senior Member of the IEEE and past Chairman of the Kansas City Chapters of both the IEEE and the IEEE Computer Society. Mark also served as the program director for, a board member of, and webmaster of, the Midwest Chapter of the 7x24 Exchange. He has also held memberships with the following organizations: NETA, NFPA, International Association of Webmasters, and Institute of Certified Professional Managers.