

## Portable Generators On boats. Pro and Con?

Let me say right up front, that I do not and have not ever recommended using portable generators on boats. I personally believe it is not wise to do so. I think the safety issues outweigh the convenience. However, people are doing it. I have talked to knowledgeable boat owners and marine professionals who think it is safe to use them. There are two sides to the issue. Hopefully the following information will help you decide for yourself.

There are many quality portable generators on the market today produced by well known manufacturers. Boat owners who have smaller boats and smaller budgets are in a quandary about whether or not these are safe to use on their boat. The price of these portables may be one quarter of the price of a permanently installed marine generator. When you are tied up to a dock and the temperature is in the nineties, the humidity stifling, and you want to run the air conditioning, but can't use shore power, and you don't have a permanently installed generator, what do you do? The answer is not that simple.

The main issue is how you use the generator. Do you bring it on board, leave it on the dock, or actually install one on your boat? There are regulations that apply to permanently installed gasoline engines on boats. The fuel systems, electrical systems and ventilation for permanently installed gasoline engines must meet these regulations to be safe. So it is obvious that installing a portable in an enclosed compartment on a boat poses problems.

First, portable generators are typically not ignition protected. That is they can produce a spark, such that if gasoline fumes were present, would ignite the fumes. All electrical equipment on a permanently installed generator must be ignition protected.

Second, the fuel systems on portable generators do not meet the requirements for hoses and fuel fittings that a permanently installed engine must meet. So the potential for a fire is real if a leak develops, and if there were a fire from another source, the hose and fittings on the portable would not have the fire resistance that are required of permanently installed engines..

Then there is the problem of exhaust, ventilation, and Carbon Monoxide. Obviously it would need to be exhausted to the outside, and a source of air for ventilation would be necessary. Otherwise the engine could not breathe properly, gas fumes would not be ventilated out of the enclosure, and Carbon Monoxide could accumulate in deadly quantities.

Then there is the issue of grounding. These generators produce Alternating Current, which can be dangerous on a boat even under the best circumstances. A properly wired and grounded installation is absolutely necessary on a boat, or a serious shock hazard can exist. Most of these portable generators are state of the art and have three wire systems that carry the green grounding wire, and provide adequate grounding. Some also have

provision for externally grounding the generator itself. Most have built in circuit breakers and some have built in Ground Fault Circuit Interrupters in the event of a short to ground.

I would never recommend permanently installing one of these on a boat. Manufacturers of permanently installed generators not designed for marine use have a statement in their owners manual. It says “ Do not use this Genset on a boat. Such use may violate US Coast Guard regulations and can result in severe personal injury or death from fire, electrocution or carbon monoxide poisoning”. You won’t find this warning in the owner’s manual of portable generators but the same reasoning applies.

I have seen portable generators installed on boats. One was installed on a houseboat in an open cage on the top deck. Unfortunately there was no provision made for fuel overspill while fueling the permanent tank. Fuel would have spilled and drained onto the generator. Also, the fuel lines used were not compliant with regulations and the battery installation was not correct.

Another one was installed on the very aft end of one of the pontoons on a pontoon boat. Again, it had the same sort of problems. The fuel hoses were incorrect, the wiring was scary, and the fuel tank installation was not in compliance. This is not to say it can’t be done, but by the time you get through making the changes to meet the regulations for safety, you will probably have spent as much as it would have cost for a marine generator.

So where does this leave us? The only really safe place to use these generators is outside. If care is taken to place the generator in the open, dispersing fumes away from the boat, then carbon monoxide should not be an issue. If your boat’s ac electrical system is properly wired and grounded then shock hazard should not be an issue. .

The best practice is to leave the generator on the dock. Be careful that you have a cord that can carry the current load. The generator should be close enough to the boat so there is no worry about long lengths of cord causing too much voltage drop and heat in the wire. At least a 20 amp cord is good, a 30 amp better. It depends on the capacity of the generator. Make absolutely sure it is a three wire cord. Never, ever remove the third prong on these cords and do not use an adapter to a two wire system. This removes the safety wire that carries current to ground in case of a fault. Without this a serious shock hazard can exist. Never use a common household extension cord. Go to a hardware store, marine outlet, or RV store and buy a good heavy duty extension cord. Many fires on boats, especially in the winter, are due to old and worn shore power cords, corroded or loose sockets and plugs, or cords that are not rated for the load they are carrying. So when using a portable generator make sure the power cord is in good condition and up to or higher than the rated amperage of the generator. Keep the cord out of the water. Do not touch the generator or cords if you are wet, have wet hands, have bare feet, or if the equipment is wet. Never handle live electric cords or equipment with bare feet.

The best practice is to run the electrical equipment directly off of the generator. Do not power your electrical system by just plugging into a socket. If you want to power your electrical system you need to have a transfer switch installed. Not doing this can result in back feeding and shock hazard. Get a power strip with a built in circuit breaker. Run your cord to the power strip. Then plug your appliance, converter/charger, or equipment into the power strip.

The question arises about using these when the boat is underway. I would not recommend this except in an emergency when the safety of the boat and lives is at risk. All the above issues become exaggerated when the boat is moving, rolling, and heaving. When there is rain and spray and water on the deck. Where do you put the generator under these conditions? It's better not to use it at all. All manufacturers recommend you keep them dry and out of the rain. If it gets wet, a serious shock hazard exists. If you are wet, a serious shock hazard exists. These things can be dangerous in wet weather.

Here are some links on using portable generators, and about the hazards that you need to be aware of to use them safely.

Consumer Product Safety Commission on Portable Generators.

<http://www.cpsc.gov/cpsc/pub/pubs/portgen.html>

<http://www.cpsc.gov/library/portgen.pdf>

OSHA document on using portable generators safely.

[http://www.osha.gov/OshDoc/data/Hurricane\\_Facts/portable\\_generator\\_safety.pdf](http://www.osha.gov/OshDoc/data/Hurricane_Facts/portable_generator_safety.pdf)

Red Cross PDF Document on using portable generators during disasters.

[http://www.redcross.org/static/file\\_cont3250\\_lang0\\_1272.pdf](http://www.redcross.org/static/file_cont3250_lang0_1272.pdf)

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