OCEAN COUNTY ARES EMERGENCY GENERATOR USE
By WX2NJ

The following was taken from September and October Ocean County ARES Newsletters in 2012:

I recently purchased a “used” 9KW dual-fuel (gasoline/propane) generator from a gentleman in Atlantic County, who used the unit for less that 100 hours during the massive June 29, 2012 storm that swept through Southern NJ and many parts of the East Coast. Part of the sale included a heavy-duty power cable and connectors to tie the unit into your home power system. Unfortunately, the connector setup that was used on the cable was illegal and is commonly known as a “lineman killer”. It involved feeding the generator 120/240 volt output directly into a dryer outlet and backfeeding power into your home electrical system. If, by chance, the main breaker was closed on the home power panel, 240 volts would be fed back into the utility companies power transformer secondary winding and would power dead utility conductors with high voltage at or near the primary voltage rating of the utility transformer. This practice is a violation of the National Electric Code (NEC) and has unfortunately taken the lives of linemen. If you have ever been in a Home Center during the threat of a power failure or during a power failure, you will see customers by the dozens scrambling to obtain connectors for this type of setup. The cable terminates in a typical dryer plug with male prongs, which have the ability to be live and unprotected to anyone coming in contact with the connector.

The purpose of this and next months articles, is to outline the correct way to connect a generator to a home power system. First, you must plan ahead. The time to arrange a generator connection scheme is not after you have already lost power, but well ahead of the power outage. This should be part of your family emergency plan that many talk up, but few act out.

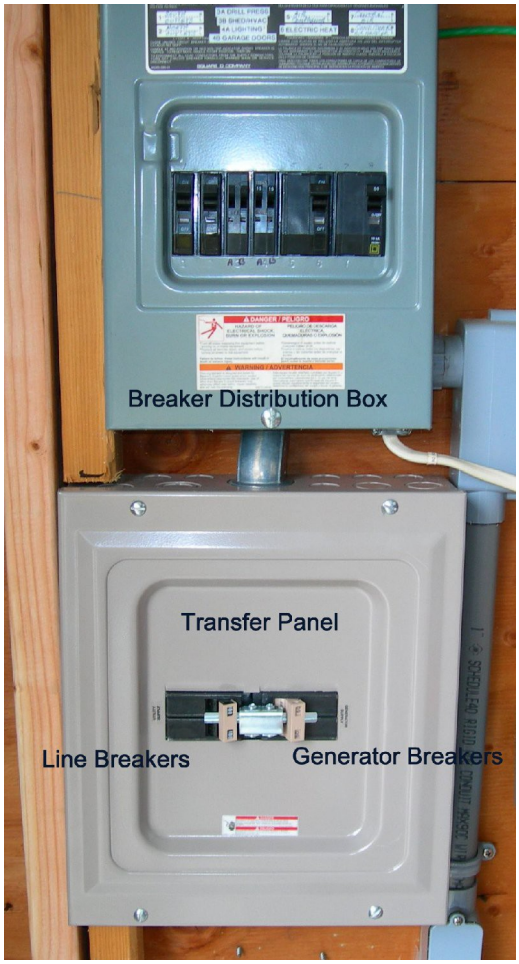
I’m going to assume that the generator to be used is a portable type device and not a permanent installed generator. Permanent installed generators are normally installed by licensed personnel and meet the requirements of the NEC.

The first setup is the simplest and merely involves plugging loads to be powered into outlets on the generator by the use of heavy extension cords, which then may pass through open windows and/or door openings. This may be fine to power a refrigerator and some portable lights, but what if the user wants to power a 240 volt well pump and a furnace (for Winter outages) and possibly a cooling/heating inverter (for Summer cooling).

The second setup involves the installation of a transfer switch to the main breaker of the power panel of your residence. Any work on your electrical system has to be performed by licensed electricians or as a homeowner, you can do the work after obtaining proper permits and inspections. The photo below shows a typical “whole house” transfer panel (tan colored panel on bottom) installed in such a manner that either utility power is supplied to the distribution breaker panel (with the left hand 100 amp breakers closed) or generator power is being fed to the distribution breaker panel (with the right hand

60 amp breakers closed). A physical UL interlock prevents both utility and generator breakers from being shut and the same time.
Conduit passes out the back of the transfer panel and allows injection of 120/240 volt generator power up to 30 amps (7500 watts) via a UL approved power inlet box on the outside of the residence. Appropriate breakers would have to be opened or closed on the distribution panel in order not to overload the generator and balance the load. Watt meters are also available to monitor the generator feed to help balance the load between neutral and each side of the line. Because of the way in which larger portable generators are designed, they generate power in two equal halves. A generator which has an output of 5000 continuous running watts, for example, generates power from two 2500 watt sides. This type of installation also allows the operation of any 240 volts appliances connected to the distribution panel as long as the generator capacity is not exceeded.

As you can see, there is a lot to the process and an early plan can save a lot of frustration and confusion in an emergency. Put together a family emergency plan NOW and save yourself grief in the future. Next month I'll cover a third option of a transfer panel for selected circuits on a breaker distribution panel.



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Last month I discussed the use of a whole-house electrical transfer panel to interface an emergency generator into your electrical system and this month I would like to discuss the use of a Power Transfer Panel for selected circuits.

Pictured below is a typical Transfer Panel for selected circuits. This particular panel is for six circuits, but many others are available. This panel is available with a power inlet (from the generator) on the panel next to the two wattmeters or (as shown below) is covered with a plate and the generator inlet box can be mounted anywhere and routed to the transfer box via conduit. In this particular installation, the Power Inlet Box is directly behind the Transfer Panel on the outside wall of the home (close to the utility meter pan).

The beauty of this type of Transfer Panel is that a circuit can be transferred over to generator power simply by toggling a selector switch from “LINE” to “GEN”. It is wired to the main breaker distribution panel between a branch circuit breaker and the associated load. In the “LINE” position, the load is connected directly to the branch circuit breaker and passes through the Transfer Panel toggle switch. In the “GEN” position, the load is connected to the circuit breaker above each toggle switch and then to the generator. This provides a branch breaker when connected to the generator and isolates the power from the main breaker distribution panel and prevents power feedback into the utility company.

Dual wattmeters allow you to monitor and balance the load on your generator since power is generated in two equal “halves”. Note that the two center toggle switches (C and D) are tied together. This is for a 230 volt well pump. All other circuits are 120 volt.

In the installation shown below, the six circuits that were selected feed a well pump, refrigerator, chest freezer, heating boiler (including circ pumps) and general lighting circuits. When utility power is restored (which can be detected by other circuits becoming energized), each toggle switch can be easily be returned to the “LINE” position.

As with any electrical work, this type of panel would be installed by a licensed electrician with the proper permits. Once it is installed, generator power can be safely transferred to selected circuits and eliminates temporary cords and cables from running through windows and doors. It reduces the burden of trying to find the best way of getting power to critical loads during power outages when you are under enough stress during an emergency and it is easy to make a mistake.

A typical six circuit Transfer Panel for selected circuits

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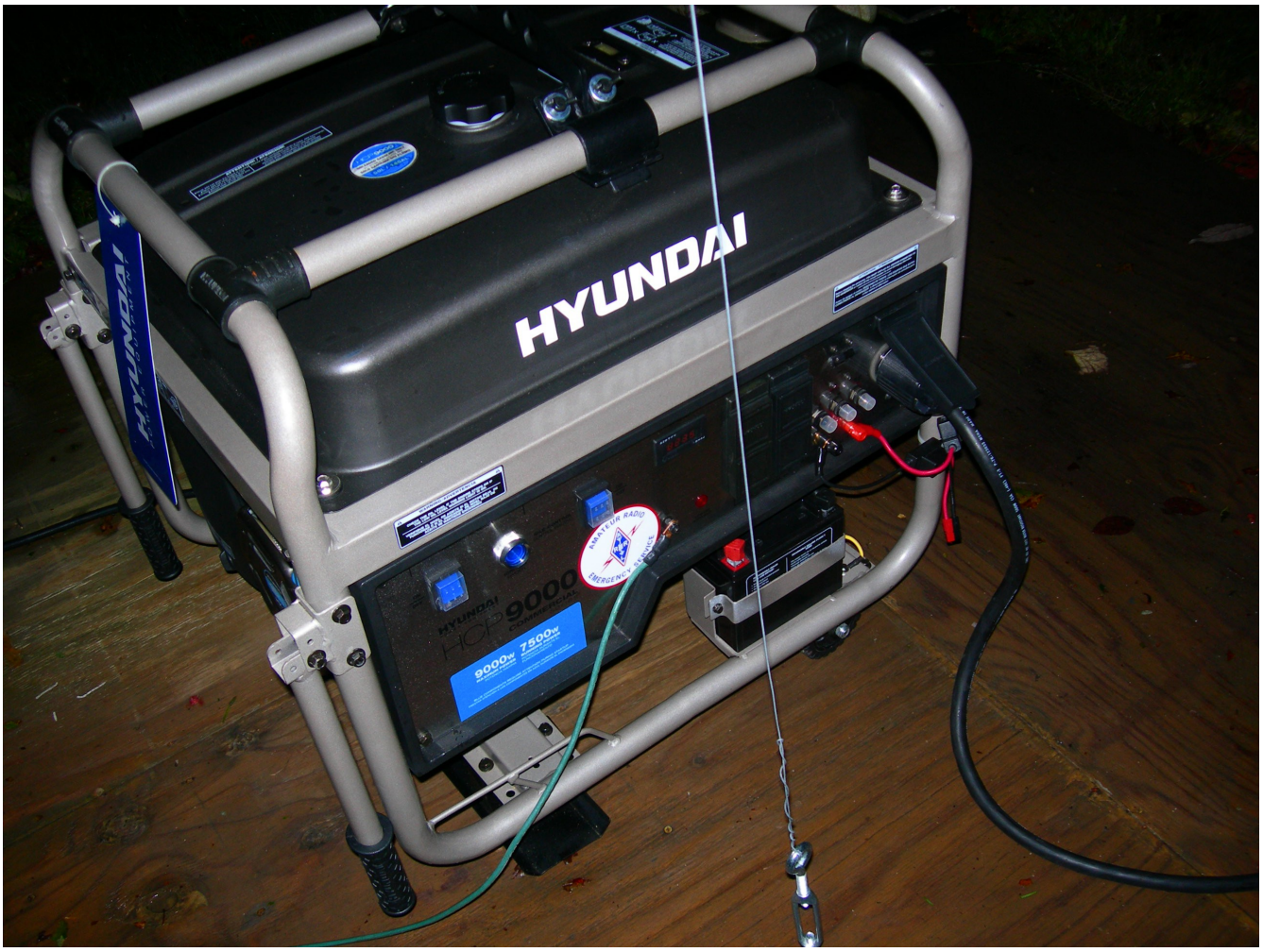

GENERATOR IN USE DURING SUPERSTORM SANDY – October 2012

The generator ran for 54 hours continuous operation until utility power was restored. Since the fuel source is a 250 gallon above ground tank, no shutdown was required as is the case with gasoline engines. Most service stations were closed due to the loss of utility power and gasoline was at a premium. A heavy chain lock was also added after this photo was taken to prevent theft. The generator is also in view of an infrared closed circuit camera system.

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