

## **Generator Safety**

As with any outage, you and your family are temporarily prevented from enjoying something we use every day: electricity. When ice storms, lightning, and other conditions create outages, Shenandoah Valley Electric Cooperative works quickly to restore power and have your family enjoying the conveniences of electricity again as soon as possible.

In the meantime, you may want to use electricity, and a generator gives you that option. When selecting and using a generator, common sense and caution should be exercised to choose the generator that's best for you and your family's needs, and prevent possible injuries.

Generators are widely available in a range of sizes and configurations. They can provide electricity for use in remote areas or can serve as back-ups for entire homes, businesses and industries. Some come equipped with gas or diesel engines and others operate from the powertake-off (PTO) attachment found on farmtractors.

These devices all have one thing in common – they produce electricity at levels high enough to cause injury, death, and property damage. That doesn't mean they shouldn't be used but, like any other electrical equipment, they must be properly installed and correctly sized.

If you plan to provide enough electricity to power your entire home during an outage, you will need a generator with a relatively large capacity. Generators are rated by the wattage they produce – usually expressed in kilowatts (kw) – and are sized according to the loads they need to serve. A kilowatt equals 1,000 watts. Also important is your kind of service, single- or three-phase power. Most homes and farms have single-phase power with 120/240 dual voltage.

### **SIZING A GENERATOR**

To determine the size of the generator needed, total the rated watts of the appliances and fixtures you'll want to operate during an outage. Some loads are easy to determine – a 100-watt light bulb, for example, uses 100 watts. Ten 100-watt bulbs would require 1,000 watts, or 1 kw. The power requirements for appliances are often provided in the operating manual. These specifications are also stamped on the “face plate” along with serial and model numbers. While the power needs of individual appliances vary, those that produce heat or use large motors tend to require higher wattages. An average 14-cubic-foot refrigerator with automatic defrosting, for example, requires about 615 watts while an electric range at 12,220 watts needs nearly 20 times as much power. Electric space heaters and water pumps are usually rated 1,000-1,800 watts (1-1.8 kw) and an operating electric water heater requires 2,500-4,500 watts (2.5-4.5 kw). As you can see, a household's power requirements can quickly add up.

### **KEEPING IT AFFORDABLE AND SAFE**

To cut costs when planning an emergency power supply for the home or farm, consider providing sufficient capacity for only essential appliances, disconnecting the “frills” until normal service is restored. More important than sizing is correct installation. Auxiliary power sources must be completely isolated from the electric utility's lines attached to your meter to avoid “backfeed” into the electric utility's system. During an

outage, crew members working to restore power – or anyone who contacts a downed line – could be seriously injured or killed by “backfeed” from an improperly installed generator.

A special switch is used to transfer a building’s wiring from normal to a standby power source. The switches – double-throw devices – are designed to prevent a home generator’s feedback from passing through electric utility lines and transformers. They make it impossible to connect the main power source to the generator. Electric utility transformers can step up a generator’s power output, creating a dangerous primary voltage hazard on the electric utility’s lines. The switch makes sense and its use is required by the National Electric Code when connecting an auxiliary power source to an existing system. Remember, the switch and its wiring will carry all the load for the building it serves when connected to electric utility lines during normal operation.

These switches, like the generators they connect, are available in several configurations and power ratings. Choose one matched to your electric utility’s service connection – 200 amp, 400 amp, three-phase, etc. – not one matched to the generator output. In most areas, local codes and electric utility policies require auxiliary power connections be inspected and approved by a recognized electrical inspection agency before they can be used. If you are installing an emergency back-up generator, contact Shenandoah Valley Electric Cooperative as well as generator equipment dealers. Together they can help you select a system that will safely provide temporary power when needed without creating additional problems or hazards.