Proper generator installation

In power outage situations, you may need to install a back-up generator to provide back-up electricity for your entire home, or most of it, where your appliance remains plugged into the wall sockets and electricity flows through the house wiring. This requires careful installation involving a permanently mounted generator and special wiring.

Avoid danger of back-feeding – Use a transfer switch

If the generator is not properly wired into the home there is a danger of back-feeding electricity into Dakota Electric's system. This is very dangerous and could result in serious injury or death to anyone coming into contact with electric lines while working to restore power in an emergency. To provide this type of installation as safely as possible, a transfer switch must be installed that will break the connection to the electric company's service when the generator is in use and, similarly, disconnect the generator connection normal power has been restored. This switch is normally located between your home's main service panel and the power sources.

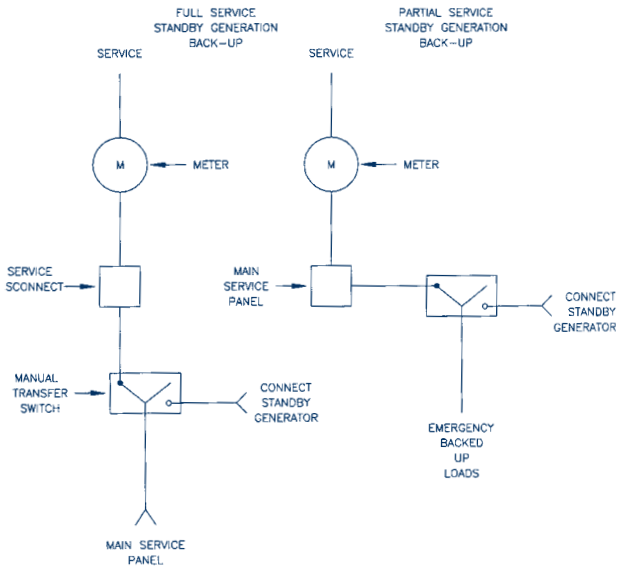
Single phase electric service requires a two pole, double throw switch. Three phase service requires a three pole, double throw switch. Installation must be performed by a licensed electrician and must conform to the National Electric Code.

Remember: Running a generator attached to house wiring without a transfer switch could kill someone.

How does a transfer switch operate?

A transfer switch delivers the right amount of voltage to your home via back-up generation. Normally, electric current from Dakota Electric's lines goes through a transformer to step 7,200 volts of electricity down to 120 and 240 volts for use in your home. Running a generator without a double-throw switch installed on your system, may feed 120 volt current right back into the transformer. If this happens, the transformer will step the voltage back up to 7,200 volts, potentially giving a lethal shock to anyone who contacts the line. In addition, when power is restored to Dakota Electric's lines, your generator will be damaged unless it is isolated from the lines by a double-throw switch. Your transfer switch must be sized according to the rating of your home's service entrance equipment. Common sizes are 100, 150 or 200 amperes. To ensure proper installation of a standby generator and comply with electrical code requirements, please contact a qualified electrician.

CUSTOMERS EMERGENCY SUPPLY
ONE-LINE DIAGRAM ILLUSTRATIONS
FOR STANDBY GENERATORS



System operating requirements

System operating requirements for such installations will be determined separately for each installation as they are dependent upon location, generator type, generator size and other system parameters. If there is continuous or intermittent electric consumption on the service, metering will be required.

This portion of the brochure defines the minimum requirements for the safe and effective implementation of such an electrical interconnection. It does not define scheduling requirements for generation which will be operated in parallel with Dakota Electric's system.

Electric code requirements for optional standby systems

702.2 Optional Standby Systems.

Optional standby systems are intended to protect public or private facilities or property where life safety does not depend on the performance of the system. Optional standby systems are intended to supply on-site generated power to selected loads either automatically or manually. (FPN): Optional standby systems are typically installed to provide an alternate source of electric power for such facilities as industrial and commercial buildings, farms and residences, and to serve loads such as heating and refrigeration systems, data processing and communications systems, and industrial processes that, when stopped during any power outage, could cause discomfort, serious interruption of the process, damage to the product or process, or the like.

702.4 Equipment Approval

All equipment shall be approved for the intended use.

702.5 Capacity and Rating

An optional standby system shall have adequate capacity and rating for the supply of all equipment intended to be operated at one time. Optional standby system equipment shall be suitable for the maximum available fault current at its terminals. The user of the optional standby system shall be permitted to select the load connected to the system.

702.6 Transfer Equipment

Transfer equipment shall be suitable for the intended use and so designed and installed as to prevent the inadver-

Electric code requirements continued

tent interconnection of normal and alternate sources of supply in any operation of the transfer equipment. Transfer equipment, located on the load side of branch-circuit protection, shall be permitted to contain supplementary overcurrent protection having an interrupting rating sufficient for the available fault current that the generator can deliver.

702.8 Standby
A sign shall be placed at the service-entrance equipment indicating type and location of on-site optional standby power sources.

Generator panel
The square D generator panel provides safe connection of a back-up power source to critical circuits such as heating, lighting, or air conditioning. Two main breakers provide for utility and backup power connections.

- 30A and 60A mains
- Four single pole spaces can accommodate up to eight circuits
- Mechanical interlock prevents both mains being in the "On" position

Service to emergency equipment
Equipment connected to the supply side of service disconnection means such as fire pump equipment, fire and sprinkler alarms, emergency lighting systems, etc. may be unmetered if used only during times of emergency.

Inspection/Approvals
Approval by the authority having jurisdiction is required.

DAKOTA ELECTRIC ASSOCIATION

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Guide to Installing a Standby Backup Generator

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