

# Separate, Standby or Emergency Generation Transfer Systems

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### 1. PURPOSE

- 1.1 This standard describes the requirements for the design and operation of separate standby or emergency transfer systems which supply electric power to customer's circuits that are normally served by NV Energy's distribution system.

### 2. GENERAL

- 2.1 In general, any portable electric generator which is capable of being temporarily connected to a customer's electrical system, (residential and commercial) which is normally supplied by NV Energy shall be connected only after opening the customer's main service switch so as to isolate the customer's electrical system. Also, the generator must be disconnected before reclosing the main service switch to restore normal electric service. Any electrical generator, other than one authorized by NV Energy to run in parallel with NV Energy, or standby power source capable of being permanently or temporarily connected to a customer's electrical system shall be connected only by means of a visibly open double throw-switch, to isolate the customer's electrical system from NV Energy's system. Failure to isolate the customer's electrical system from NV Energy's system can cause electrical feedback and endanger both life and property. Any person who possesses and intends to use any such auxiliary generator or standby power source on an electrical system normally supplied by NV Energy must notify the local NV Energy office of the units' installation location. All auxiliary and standby power sources must be installed in compliance with all National Electric Codes (NEC) and local/state/federal ordinances.
- 2.2 The customer's system addressed in this standard is separate generation and is excluded from parallel generation such as might be found with small power producers, co-generation, or net metering. (RE-1, RE-2, RE-3).

### 3. REFERENCES

- 3.1 National Electrical Code (NEC) Article 445: Generators.
- 3.2 National Electrical Code (NEC) Article 517: Health Care Facilities.
- 3.3 National Electrical Code (NEC) Article 695: Fire Pumps.
- 3.4 National Electrical Code (NEC) Article 700: Emergency Systems.
- 3.5 National Electrical Code (NEC) Article 701: Legally Required Standby Systems.
- 3.6 National Electrical Code (NEC) Article 702: Optional Standby Systems.
- 3.7 National Electrical Code (NEC) Article 705: Interconnected Electrical Sources.
- 3.8 National Electrical Safety Code (NESC), Articles 120 and 121C.
- 3.9 Nevada Power Company Electric Rule 19: Standby and Auxiliary Service.

### 4. CUSTOMER DESIGN REQUIREMENTS

- 4.1 Separate Operation

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### 4.1.1 General

The electrical characteristics of transfer switches shall be suitable for the operation of all functions and equipment which they are intended to supply. The capacity of the transfer switches shall be adequate for switching all classes of loads to be served and withstand the effects of available fault currents without contact welding. Where an alternate source is used to supply the same load supplied by NV Energy as a normal source, transfer equipment for shifting from one source to the other shall open all ungrounded conductors of one source before connection to the other.

Transfer switches must meet all ANSI, NEMA and utility specifications.

### 4.1.2 Automatic Transfer Switch

Automatic transfer switches shall be electrically operated and mechanically held. The transfer switch shall transfer and may retransfer the load automatically. A reliable mechanical interlocking, or an approved alternate method, shall be inherent in the design of transfer switches to prevent the interconnection of the normal and alternate sources of power, or any two separate sources of power. Two lights, properly identified, shall be provided to indicate the transfer switch position.

A means for the safe manual operation of the automatic transfer switch shall be provided.

### 4.1.3 Non-automatic/Manual Transfer Switches

Manual switching devices shall be mechanically held. Operation shall be by direct manual or electrical remote manual control. Electrically operated switches shall derive their control power from the source to which the load is being transferred. A means for safe manual operation shall be provided.

A reliable mechanical interlocking or an approved alternate method, (double throw safety switch), shall be inherent in the design to prevent the interconnection of the normal and alternate sources of power, or any two separate sources of power. Lights or other indicators properly identified shall be provided to indicate the switch position.

## 4.2 Momentary Parallel Operation (Exception)

The momentary paralleling of the customer's generation equipment and NV Energy's system is only allowed on an exception basis. The Standards Engineer and the System Protection Engineer must review and approve all parallel systems. This scheme is very expensive and demands careful design consideration to ensure equipment and personnel safety. Parallel switch operations require a detailed system design containing many monitoring devices and relays, i.e., reverse power, directional current, timing, over/under voltage, synchronizing and protective. Synchronizing is the most critical operation in the system since substantial damage to the customer's generator can result.


## 4.3 Approval

In order to be approved by NV Energy the transfer switch and equipment selected by the customer must meet the requirements of all applicable federal, (NEC, NESC), state, and local codes, as well as NV Energy standards.

The customer will supply to NV Energy two copies of its proposed electrical plans, such as single-line meter and relay diagrams, along with a full description of function, features and operation of the proposed parallel/transfer switch and their interlocking devices, preferably in the form of the manufacturer's full specification with illustrations and references to existing installations.

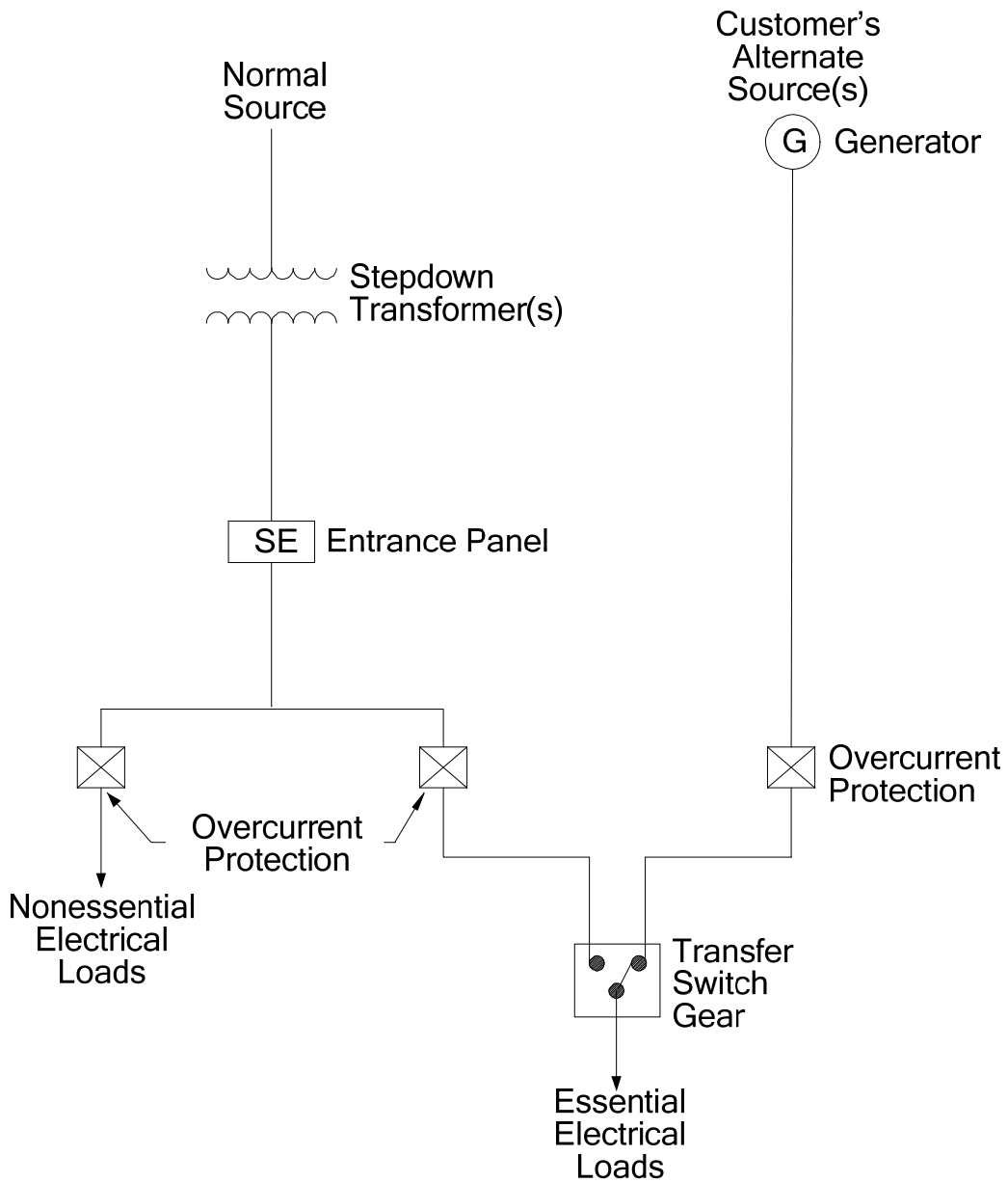
As a precondition for approval, all automatic parallel/transfer switches shall meet the appropriate UL standards. Automatic and manual transfer switches will be a true double throw, inherently interlocked switch.


The utility will be most critical with regard to the degree in which the interlocking features on transfer switches can be defeated.

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5. SWITCHING DIAGRAM (EXAMPLE)




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