Requirements for Non-Qualifying Generation – Emergency and Standby

As indicated in Lincoln Electric System's (LES) Service Regulations, customer-owned emergency or standby generating facilities that do not meet the Federal Energy Regulatory Commission (FERC) criteria for Qualifying Facilities are generally only allowed to operate in parallel with LES for periodic testing purposes. This type of generation is referred to as Non-Qualifying generation and is not included under FERC Qualifying Facilities because it does not further the goals of the Public Utility Regulatory Policies Act of 1978 (PURPA).

Any energy produced during testing that is in excess of a customer's load will not be compensated by LES. Periodicity and duration of parallel testing shall be limited to once a month and 4 hours, respectively.

LES shall be notified of all emergency generation installations and approve the final wiring before the generator is put into service. The customer will operate the generator in compliance with these requirements and the terms of the LES Service Regulations.

On a case-by case basis, LES may grant a waiver for a customer to contract to operate a Non-Qualifying generator in parallel for more than testing purposes under agreement with LES to generate only at times of LES' request.

A-1. EMERGENCY GENERATION INTERCONNECTION TYPES

Type 1: Open-Transition Transfer Switch

The customer may connect generation using an LES approved open-transition transfer switch. This type of transfer switch breaks the circuit connection to LES service wires before making the circuit with the customer's generation and, conversely, breaks the circuit connection to the customer's generation before connection to LES service wires. An open-transition transfer switch is considered a Type 1 installation.

Type 2: Closed-Transition Transfer Switch (100ms transfer or less)

The customer may connect generation using an LES approved closed-transition transfer switch. This type of transfer switch makes the circuit connection to the customer's generation before breaking the connection to LES service wires and, conversely, makes the circuit connection to LES service wires before breaking the circuit with the customer's generation. The transfer control equipment must be incapable of transition time greater than 100 milliseconds to be considered a Type 2 installation.

Type 3: Closed-Transition Transfer Switch (Greater than 100ms transfer)

The customer may connect generation using an LES approved closed-transition switch with transfer control equipment that is capable of being set or programmed for transitions of greater than 100 milliseconds. This is considered a Type 3 installation. For a Type 3 installation, the owner shall provide interconnection relaying to automatically disconnect and isolate the customer's facility from LES during a service interruption. Such equipment must be capable of preventing the emergency generation facility from energizing the LES service wires during a service interruption. Refer to the latest version of IEEE standard 1547 section on Islanding.

Type 4: Parallel Connection

The customer may install generation for LES approved parallel operation. This is considered a Type 4 installation. For a Type 4 installation, the owner shall provide interconnection relaying to automatically disconnect and isolate the customer's facility from LES during a service interruption. Such equipment must be capable of preventing the emergency generation facility from energizing the LES service wires during a service interruption. Refer to the latest version of IEEE standard 1547 section on Islanding.

LES does not allow closed-transition or parallel operation of customer-owned generation with LES secondary spot or grid networks (i.e., the LES downtown network).

A-2. SAFETY AND PROTECTION REQUIREMENTS

These requirements shall be applicable to ensure the safe and reliable operation of customer-owned emergency generation. The adequacy of protection devices used for interconnection with emergency generation facilities will be determined solely by LES. The following requirements shall be generally applicable unless modified in writing and mutually agreed upon by LES and the owner of the emergency generation facility with any specific requirements for compliance identified as applicable.

The owner, at LES' request, shall provide information and settings pertaining to the protection system and shall accommodate an on-site inspection and testing of the protection system if requested by LES. LES shall give reasonable notice of the time when any inspection or test shall take place such that the owner may have a representative present at the test and inspection.

A-2.1. Disconnect Equipment (Types 3 and 4)

The owner shall provide equipment for manually disconnecting and isolating the emergency generation facility from the LES service wires. An outside-mounted visible disconnect shall be installed on the owner's side of the point of delivery/receipt near the meter or mutually agreed upon location. Such equipment must be capable of preventing the emergency generation facility from energizing the LES service wires and must include a device which, at LES' discretion, LES employees can operate and lock in place.

This disconnection means is in addition to the automatic disconnection provided by interconnection (main) breaker and interconnection relaying for installations in which these are required.

A-2.2. Fault Protection (All Types)

Adequate protection facilities shall be provided by the owner to protect the LES service wires from fault currents originating from the emergency generation facility. The owner shall also be responsible to provide adequate protection for the emergency generation facility from fault currents originating in the LES electrical system. The owner's fault protection settings must coordinate with upstream LES protection devices.

A-2.3. Over/Under Voltage (Types 3 and 4)

It shall be the responsibility of the owner to install interconnection relaying to provide adequate protection or safeguards to prevent damage to the LES electrical system caused by over/under voltages originating in the emergency generation facility and to protect the emergency generation facility from inadvertent over/under voltage conditions originating from the LES electrical system. Refer to the latest version of IEEE standard 1547 for voltage ranges and clearing times when setting the interconnection relaying.

A-2.4. Synchronization (Types 2, 3, and 4)

The owner shall provide adequate facilities for the proper synchronization of the emergency generation facility with LES service wires such that synchronization is accomplished without causing undesirable currents, surges or voltage dips on the LES electrical system. LES employs automatic reclosing on its system circuit breakers. A fault and the subsequent breaker trip and reclose can cause an out-of-phase condition to exist between LES and the emergency generation facility. Following a period of interruption, the proper resynchronization of the emergency generation facility shall be the responsibility of the owner. Refer to the latest version of IEEE standard 1547 for synchronization parameter limits.

A-2.5. Grounding (All Types)

The owner shall ground the emergency generation facility and associated equipment in such a manner that coordination is maintained with the relay protection system in use by LES and the emergency generation facility is protected from being subject to deleterious voltage and excessive current conditions.

A-2.6. Harmonics (Type 4)

Adequate design precaution must be taken by the owner to prevent excessive and deleterious harmonic voltages and/or currents caused by the emergency generation facility from occurring on the electrical system of LES or LES' customers. The emergency generation facility must be designed to operate with normal harmonic voltage and currents that originate from the LES electrical system. Refer to the latest version of IEEE standard 1547.

A-2.7. Power Factor (Type 4)

The operation of the emergency generation facility shall not produce nor consume excessive reactive power. If the power factor falls outside acceptable limits either lagging or leading, as determined by LES, the owner shall undertake the necessary modifications to meet the required power factor level.

A-2.8. Voltage Flicker (Types 2, 3, and 4)

Voltage surges or flickers caused by the operation, synchronization, or isolation of the emergency generation facility shall be within the standards of frequency of occurrence and magnitude established by LES to prevent undue voltage flicker on the LES electrical system. The owner shall provide suitable equipment to reasonably limit voltage fluctuations caused by the emergency generation facility.

A-2.9. Voltage Balance (All Types)

The voltage produced by the emergency generation facility must be balanced if it is a three-phase installation. The owner shall be responsible for protecting the emergency generation facility from an inadvertent phase unbalance in LES service voltage.

A-2.10. Over/Under Frequency (Types 3 and 4)

The owner shall provide the necessary facilities for safeguards and protection of equipment caused by the occurrence of an over or under frequency event. Refer to the latest version of IEEE standard 1547 for frequency ranges and clearing times when setting the interconnection relaying.

A-2.11. Governmental Regulations, Codes, and Ordinances (All Types)

The owner of the emergency generation facility is responsible for complying with all applicable federal, state, and local regulations, codes, and ordinances including electrical codes. The LES review of design specifications and drawings or LES inspections shall not be construed as approvals as to compliance with any such regulations, codes, and/or ordinances. This includes, but is not limited to, environmental laws and regulations, safety laws, building and construction codes, local safety, health, industrial regulations or codes, and the LES Safety Manual.

A-2.12. Additional Safety, Protection, and Operating Guidelines (All Types)

The owner of the emergency generation facility is required to provide and maintain suitable apparatus to prevent the operation of the generation facility from causing unusual fluctuations or disturbances on the LES electrical system.

The owner of the emergency generation facility will cooperate with LES in developing mutually acceptable operating procedures for delivery of the output from the facility.

The owner of the emergency generation facility will be responsible for providing and maintaining all equipment deemed necessary for the protection of the customer-owned property and operations. By virtue of the interconnection with the emergency generation facility, LES assumes no liability for the protection of any property or person associated with the emergency generation facility's operations.

All protection, safety, and interconnection equipment installed by the owner of the emergency generation facility must meet and maintain standards of good engineering and electrical safety practices.

The owner of the emergency generation facility is responsible for the installation and operations of the facility and will indemnify and hold LES harmless from liability for damage to property or person resulting from or arising out of or in any way connected with the installation, inspection, operation, maintenance, testing, and/or use of the emergency generation facility.

If the emergency generation facility is not performing to the established standards of service or is reducing the quality of service to other LES customers, the customer must disconnect the emergency generation facility until such time the owner takes corrective action. In the event the owner refuses to take corrective action, LES may terminate electric service in accordance with the LES Service Regulations.

A-3. REQUIREMENTS FOR INSTALLATION AND OPERATION (TYPES 1 AND 2)

A-3.1. Prior to Installation:

1) The owner shall provide, for LES approval, information for the following equipment:
   - Generator; and
   - Transfer switch.

2) The owner shall provide, for LES approval, one-line diagram of the proposed installation showing the generator, interconnection (main) breaker, transfer switch, and/or generator breaker.

3) The owner shall obtain written approval from LES prior to beginning installation.

A-3.2. Prior to Operation:

1) All approved installations will receive an “LES Approved Transfer Switch” label that must be placed on the transfer switch. The owner shall not begin initial operation of the emergency generation facility until this label is placed on the transfer switch and the emergency generation facility has passed applicable code inspection requirements.

A-3.3. First Time Operation:

1) The owner is allowed to operate the transfer switch for the first time only after all previous requirements have been met.

A-4. REQUIREMENTS FOR INSTALLATION AND OPERATION (TYPES 3 AND 4)

A-4.1. Prior to Installation:

1) The owner shall provide, for LES approval, information for the following equipment:
   - Generator;
   - Transfer switch or generator breaker;
   - Interconnection (main) breaker; and
   - Interconnection relay.

2) The owner shall provide, for LES approval, the following drawings:
   - One-line diagram of the proposed installation showing the generator, interconnection (main) breaker, transfer switch, and/or generator breaker and disconnect equipment; and
   - Interconnection (main) breaker trip schematic diagram.

3) The owner shall obtain written approval from LES prior to beginning installation.

A-4.2. Prior to Operation:

1) The owner shall provide, for LES approval, interconnection (main) breaker trip settings or interconnection (main) breaker relay settings. The customer's protection settings must coordinate with upstream LES protection devices. The interconnection relay settings must comply with the over/under voltage and over/under frequency parameters in the latest version of IEEE standard 1547.

2) LES must witness an interconnection (main) breaker trip check.

3) The owner will not begin initial operation of the emergency generation facility until it has passed applicable code inspection requirements.

A-4.3. First Time Operation:

1) LES must witness the first parallel or closed-transition operation of the facility. The LES Engineer will sign the Agreement for Non-Qualifying Generation – Emergency and Standby (Types 3 and 4) verifying the commissioning is complete.

2) The owner shall provide final interconnection relay settings. Any future changes to the interconnection relay settings must receive the approval of LES before implementation. LES will provide a label to be placed on or near the interconnection relay as a reminder of this requirement.

3) The owner will sign and send the Agreement for Non-Qualifying Generation – Emergency and Standby (Types 3 and 4) to LES.

4) The owner will receive a copy of the Agreement for Non-Qualifying Generation – Emergency and Standby (Types 3 and 4) signed by LES with the date of final LES approval.

5) LES will provide notification to the appropriate Electrical Inspector that the first time operation has passed all LES requirements.

LES' approval of the emergency generation facility's use of equipment shall not be construed as confirming or endorsing the design or effectiveness of the equipment or as any warranty of the safety, durability, or reliability of equipment.