J-A-C Electric Cooperative, Inc.

A Quick Overview of Technical Requirements of Interconnection and Operation of Distributed Generation (DG) Resources

- The DG installation must meet all applicable national, state and local construction and safety codes as well as all requirements of J-A-C and Brazos Electric Power Cooperative.
- The DG installation must be equipped with protective hardware and software designed to prevent the generator from being connected to a de-energized circuit owned by J-A-C. The DG installation shall not energize the PCC when the J-A-C system has been de-energized for any reason.
- The DG installation must be equipped with protective hardware and software designed to prevent the connection or parallel operation of the DG installation with the J-A-C system unless the J-A-C system service voltage and frequency is of nominal value.
- The DG installation shall not degrade the voltage provided to other J-A-C members to service voltages outside the limits of ANSI C84.1, Range A.
- The J-A-C distribution system is a four wire multi-grounded neutral system. All grounding must ensure that fault conditions are not worsened by the interconnection of the DG installation. For example, in the J-A-C system, the voltages of the unfaulted phases during a single line to ground fault with no DG installation will be the limit of the voltages of the same unfaulted phases during a single line to ground fault with the DG installation.
- The DG installation shall follow the J-A-C system frequency with the range of 59.3 Hz to 60.5 Hz (on a 60 Hz nominal value). The DG installation shall disconnect from the J-A-C system within 0.16 seconds if the frequency goes outside of the range specified.
- The DG installation shall synchronize with the J-A-C system without causing a voltage fluctuation at the PCC greater than +-5% of the operating voltage. Synchronism shall be automatically performed by hardware and software.
- The DG installation shall be equipped with a disconnect by means of which the DG installation and all protective devices and control

apparatus are able to be disconnected entirely from the circuits supplied by the DG installation.

- Interconnection system response to abnormal voltages shall include disconnecting from the J-A-C system within the following limits:

Voltage Range (Volts, 120V nominal)	Clearing Time (sec)
V<60	0.16
60<V<l06	2.0
132<V<144	1.0
V>144	0.16

- The DG installation shall disconnect from the J-A-C system in the case of a fault condition on the line to which it is connected.
- The DG installation shall individually be coordinated with the J-A-C protection schemes that are utilized on the line to which it is connected.
- The DG installation shall not inject DC current greater than 0.5% of the full rated output current at the point of interconnection.
- The DG installation shall not create voltage flicker outside of industry accepted voltage flicker curves and in no case shall the flicker exceed 5% unless agreed to by J-A-C.
- The DG installation shall not inject harmonic currents into the J-A-C system outside the limits as stated in IEEE 519-1992. In no cases shall the TDD of the current be above 5%.
- The DG installation shall in no way create electromagnetic interference that causes mis-operation of J-A-C system components.
- The DG installation shall have the capability to withstand voltage and current surges in accordance with the environments defined in IEEE/ANSI C62.41 or IEEE C37.90 as appropriate.
- Islanding is not acceptable with the DG installation. Islanding is when a DG installation keeps a portion of the J-A-C system energized when power has been disconnected for some reason.
- The DG installation shall produce power at a minimum 95% power factor whether leading or lagging. The DG installation shall strive to produce power at unity power factor.