TRANSMISSION ENGINEERING STANDARDS
SUBSTATIONS

500-253 Guideline - Facility Connection Requirements for Points of Interconnection at Transmission Voltages with Generators

INITIAL RELEASE DATE: **July 28, 2010**
LAST REVISION DATE: **September 6, 2011**

This standard was reviewed and approved by key managers on September 6, 2011. Officer approval of this revision is not required.

1.0 SCOPE

1.1 This guide applies to the interconnection of a generating plant with the Oncor Electric Delivery Company LLC ("Company") transmission system (69 kV and above), in compliance with NERC Reliability Standard FAC-001-0.

1.2 This guide is subject to revision at the sole discretion of Company. It is the responsibility of the owner of the generating plant ("Generator") to request and comply with the latest revision of this guide.

2.0 DEFINITIONS

2.1 ANSI Standards – American National Standards Institute Standards.

2.2 ERCOT – Electric Reliability Council of Texas.

2.3 ERCOT Requirements –ERCOT Nodal Protocols, ERCOT Nodal Operating Guides, ERCOT Generation Interconnection or Change Request Procedure, as well as any other binding documents adopted by ERCOT relating to the interconnection and operation of generators in ERCOT. These documents are available on the ERCOT website at http://www.ercot.com/ .

2.4 Good Utility Practice – Shall have the meaning as specified in the PUCT Substantive Rules section 25.5.

2.5 IEEE Standards – Institute of Electrical and Electronic Engineers Standards.

2.6 Interconnection Agreement - ERCOT Standard Generation Interconnection Agreement. Such form of agreement is available from Company upon request.

2.7 Interconnection Procedure – Generation Interconnection or Change Request Procedure adopted by ERCOT.

2.8 NERC Reliability Standards – North American Electric Reliability Corporation Reliability Standards.

2.9 NESC – National Electrical Safety Code, approved by the American National Standards Institute.

2.10 Point of Interconnection (POI) – The point where the Company's conductors are connected to the Generator's conductors and a change of ownership occurs, as specified in the final Interconnection Agreement.

2.11 PUCT – Public Utility Commission of Texas.

2.12 Regulations – Laws, regulations, Tariff, and agreements applicable to the services provided under this guide.

2.13 Tariff – Oncor Tariff for Transmission Service approved by the Public Utility Commission of Texas. Such Tariff is available on the Company website http://oncor.com/electricity/tariffs/transrates/.

3.0 CONNECTION REQUIREMENTS

3.1 Procedures for Coordinated Joint Studies

Analyses for connection of Generators will be conducted in accordance with the Interconnection Procedure. Such procedure is available on the ERCOT website at http://www.ercot.com/gridinfo/generation/.

3.2 Procedures for Notification of New or Modified Facilities

3.2.1 Generator will notify Company of its new or modified facilities in accordance with section 4 of the Interconnection Procedure.

3.2.2 Generator and Company will notify ERCOT of new or modified transmission facilities as required by the ERCOT Nodal Protocols section 3.10.

3.2.3 Company will provide advance notice to ERCOT of its future plans to make such changes in accordance with Oncor Standard 0107 NOMCR Process. At the time such changes are to be made, Company will obtain approval from ERCOT for such changes and will notify ERCOT when such changes are implemented, both in accordance with Company's Transmission Grid Management Guide T-011 System Change Process.

3.3 Voltage Level and MW and MVAR Capacity and Demand

3.3.1 Company's transmission voltages are 69 kV, 138 kV, and 345 kV. The actual voltage for the Generator interconnection will be determined through the Interconnection Procedure.

3.3.2 The MW capacity will be specified in the Interconnection Agreement. Generator will provide to Company the generating plant auxiliary load data prior to Company procuring its interconnection equipment.

3.3.3 MVAR capacity shall conform with section 3.9 below.

3.4 Breaker Duty and Surge Protection

3.4.1 The breaker duty of Generator's transmission voltage breakers shall be capable of interrupting available faults consistent with the provisions of the Interconnection Agreement including, but not necessarily limited to, Exhibit "A" sections 5.2 and 5.6.

3.4.2 Generator's transmission voltage facilities directly connecting to the POI should meet the applicable IEEE Standards for direct lightning stroke shielding and surge arrestor protection including but not necessarily limited to IEEE Standards C62.23, 998 and C62.22.

3.5 System Protection and Coordination

3.5.1 Generator will design, install, and maintain its system protection system in accordance with the provisions of the Interconnection Agreement including, but not necessarily limited to, Exhibit "A" Article 5.6 and Attachment 3 to Exhibit "C", the ERCOT Nodal Operating Guides, including but not necessarily limited to, sections 2.6.2, 2.9, and 6, and NERC Reliability Standard PRC-001.

3.5.2 In accordance with Exhibit A, Section 5.6 of the Interconnection Agreement, prior to energizing the Point of Interconnection, Company and Generator shall conduct a complete calibration test and functional trip test on the system protection systems of both parties to ensure that such systems are functioning in a proper fashion.

3.6 Metering and Telecommunications

Generator will comply with Section 5.5 of the Interconnection Agreement regarding Metering, Telemetry and Communications Requirements and the provisions of Exhibit "C" in the Interconnection Agreement.

3.7 Grounding and Safety Issues

3.7.1 Generator will ground its transmission voltage equipment at the POI in accordance with applicable IEEE Standards including but not necessarily limited to IEEE Standard 80.

3.7.2 Generator shall implement the switching and clearances of its transmission voltage facilities in accordance with Company's switching and clearance procedures. Company will provide a copy of such procedures upon request.

3.8 Insulation and Insulation Coordination

Generator will meet the applicable requirements of the applicable IEEE Standards with respect to insulation, insulation coordination, and electrical clearances for its facilities at the POI, including but not necessarily limited to IEEE Standards 1313.1, 1313.2, and 1427.

3.9 Voltage, Reactive Power, and Power Factor Control

3.9.1 Generator will comply with all ERCOT Requirements regarding voltage, reactive power, and power factor control, including but not limited to, ERCOT Nodal Protocols sections 3.15, 3.15.1, 3.15.2, 3.15.3, and 6.5.7.7; and ERCOT Nodal Operating Guides sections 2.2.5 and 2.9.

3.9.2 During the course of the Interconnection Procedure and prior to the execution of the Interconnection Agreement, Generator will supply to Company sufficient documentation to demonstrate that Generator will be in compliance with the reactive power requirements referenced in the ERCOT Requirements.

3.9.3 Generator will install, operate, and maintain facilities, as necessary, so as to be capable of achieving a power factor between .95 lagging and .95 leading, as measured at the Point of Interconnection, at all times when the generating plant is not producing real power. Such facilities will be installed and functional by the In-Service Date specified in the Interconnection Agreement. Generator will provide, for review and comments, written documentation to Company specifying the design details of all equipment (including size of any capacitors and/or reactors) which it will install to meet these requirements by the date specified in the Interconnection Agreement. A description of such facilities will be included within the Interconnection Agreement.

3.10 Power Quality Impacts

Generator will design, construct, operate, and maintain its facilities so as to correct or isolate any abnormality that would negatively affect Company's system in accordance with Exhibit "A" Section 5.6 of the Interconnection Agreement, any applicable ERCOT Requirements, and any applicable provision of the Tariff including, but not necessarily limited to, section 4.6.2.2 of the Tariff.

3.11 Equipment Ratings

3.11.1 Generator will provide ratings data information associated with its facilities in accordance with the Interconnection Procedure, Exhibit "A" Article 7 of the Interconnection Agreement, and ERCOT Requirements.

3.11.2 Generator's transmission voltage equipment will be rated in accordance with applicable ANSI Standards, including but not necessarily limited to ANSI Standards C84.1 and C92.2.

3.12 Synchronizing of Facilities

Generator is responsible for the proper synchronization of its generating plant with Company's transmission system consistent with ERCOT Requirements, including but not limited to, sections 4.6 and 8 (Attachment A) of the ERCOT Nodal Operating Guides.

3.13 Maintenance Coordination

Generator will conduct maintenance of its transmission voltage facilities in accordance with Exhibit "A" Section 6.1 of the Interconnection Agreement and all applicable ERCOT Requirements, including but not limited to, section 3.1 of the ERCOT Nodal Protocols.

3.14 Operational Issues (abnormal frequency and voltages)

3.14.1 ERCOT is responsible for managing frequency and ERCOT requires Generator to comply with ERCOT Requirements concerning abnormal frequency issues, including but not limited to Section 8.5 of the ERCOT Nodal Protocols.

3.14.2 Generator will respond to abnormal voltage conditions in accordance with ERCOT Requirements, including but not limited to, ERCOT Nodal Protocols sections 3.15, 6.5.7.7, 8.1.1.2.1.4.

3.15 Inspection Requirements

Generator shall have the responsibility for inspecting facilities it owns to determine if such facilities have been constructed in accordance with all requirements applicable to such facilities.

3.16 Communications and Procedures during normal and emergency operating conditions

Generator and Company will exchange information under normal and emergency conditions in accordance with Exhibit “A” Section 5.1, 6.7, 7.5, 10.4, 10.6, Exhibit “C” section 6, and Exhibit “D” of the Interconnection Agreement and in accordance with ERCOT Requirements, including but not limited to sections 4 and 8 (Attachment A) of the ERCOT Nodal Operating Guides.

3.17 In order to establish an interconnection with Company, Generator is required to enter an Interconnection Agreement with Company. Company will have no obligation to begin design, procurement of materials, construction of Company’s facilities, nor make other project specific improvements until Generator and Company have entered an Interconnection Agreement.

3.18 Generator will design and construct its facilities in accordance with the applicable provisions of the following:

3.18.1 ERCOT Requirements

3.18.2 NERC Reliability Standards

3.18.3 IEEE Standards

3.18.4 ANSI Standards

3.18.5 NESC

3.18.6 Tariff

3.18.7 Laws and regulations

3.18.8 Good Utility Practice

3.18.9 Interconnection Agreement

3.19 All references herein to other documents shall mean the latest approved version of such documents.

3.20 Interconnections will be provided in accordance with the Regulations specified herein. In the event of a conflict between this guide and the Regulations, the Regulations will control.

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REVISION HISTORY
(most recent listed first)

Revision Date	Revision Request Number	Changes Made by	Summary of Changes	Background/Historical Information
9-6-11	S-00175	Jeff Herring	Updated guideline to reflect the transition from ERCOT Operating Guides and ERCOT Protocols to ERCOT Nodal Operating Guides and ERCOT Nodal Protocols.	9-6-11 -- key manager approval; officer approval not required for this revision.
7-28-10	N/A	B. Dietzman	Guidelines created to comply with NERC Standard FAC-001-0 - Facility Connection Requirements.	Initial release and officer approval - 7-28-2010.