Reference Documents

MISO Open Access Transmission Tarriff Attachment X, Appendix 6 (Generator Interconnection Agreement - GIA)
MISO Open Access Transmission Tarriff Attachment X (Generator Interconnection Procedures - GIP)
Entergy Facility Connection Requirements Website
Standard: AZ0203, latest rev.Transmission Facility Rating Methodology Guide
Voltage Schedules for Generating Facilities Interconnecting to the Entergy Transmission System
Standard: PM3901, latest rev. (Generator Interconnection Customer Requirements Standard)
Standard: AM3902, latest rev. (Power Quality Guide)
Standard: SF0201, latest rev. (Substation Grounding Design Guideline)
Standard: SF0202, latest rev. (Substation Grounding Specification & Design Guide)
Standard: SF010100 (Ground Grid Acceptance and Maintenance)
Standard: SL0003, latest rev. (Entergy Substation Design Guide)
Standard: SL0002, latest rev. (Customer–Built Substation Design Standard)
Standard: SL0001, latest rev. (Substation Design Parameters Standard)
Standard: SA0102, latest rev. (Substation Surge Arresters Purchase Specification)
Standard: TF0401, latest rev. (Shield Wire Application Guideline)
Standard: TF0501, latest rev. (Cathodic Protection Application Guideline)
Standard: AM3901, latest rev. (Guideline for Affected System Issues)

FAC-001-4, Effective January 1, 2024

				R1.1 Generation Facilities	R1.2 Transmission Facilities	R1.3 End User Facilities
R1	The Transmission Owner shall document, maintain, and publish facility connection requirements to ensure compliance with NERC Reliability Standards and applicable Regional Reliability Organization, subregional, Power Pool, and individual Transmission Owner planning criteria and facility connection requirements. The Transmission Owner's facility connection requirements shall address connection requirements for:	R1.1	Generation Facilities	Entergy Facility Connection Requirements Website		
		R1.2	Transmission Facilities		Entergy Facility Connection Requirements Website	
		R1.3	End User Facilities			Entergy Facility Connection Requirements Website
				GIP	Entergy follows the MISO Transmission Expansion Plan (MTEP) process to provide an open and transparent planning process and in order to coordinate studies of new transmission facilities and their impacts on the	Entergy follows the MTEP process to provide an open and transparent planning process and in order to coordinate studies of new end-user facilities and their impacts on the interconnected Transmission System.

						interconnected transmission system.	
			R2.1.1	Procedures for coordinated joint studies of new facilities and their impacts on the interconnected transmission systems.	**Standard: AM3901, latest rev.**	Changes to various types of transmission facilities are coordinated between Transmission (Transmission Planning and Transmission Policy) and either (1) major accounts staff and their retail customers or (2) wholesale customers. Changes are reflected in postings and models on the MISO OASIS site. Questions may be directed to the Manager of Transmission Project Development.*	Changes to various types of loads are coordinated between Transmission (Transmission Planning and Transmission Policy) and either (1) major accounts staff and their retail customers or (2) wholesale customers. Changes are reflected in postings and models on the MISO OASIS site. Questions may be directed to the Manager of Transmission Project Development.*
			R2.1.2	Procedures for notification of new or modified facilities to others (those responsible for the reliability of the interconnected transmission systems) as responsible for the reliability of the interconnected transmission systems) as soon as feasible.	**MISO OATT Attachment X**	**Standard: AM3901 latest rev.**	Changes to various types of loads are coordinated between Transmission (Transmission Planning and Transmission Policy) and either (1) major accounts staff and their retail customers or (2) wholesale customers. Changes are reflected in postings and models on the MISO OASIS site. Questions may be directed to the Manager of Transmission Project Development.*
					Standard: AM3901 latest rev.		**Standard: AM3901 latest rev.**
			R2.1.3	Voltage level and MW and MVAR capacity or demand at point of connection.	**Standard: PM3901 latest rev.**	**Standard: SL0002, latest rev.**	The Electric Service Agreement or comparable agreement (MW capacity and MVAR billing).
					Data submittal in the MISO Interconnection Request (GIP, Appendix 1)		**Standard: SL0002, latest rev.**
					Voltage Schedules	**Standard: AM3902, latest rev.**	**Standard: AM3902, latest rev.**
			R2.1.4	Breaker duty and surge protection.	**Protection systems specified in Article 9.7.5 of the Standard GIA (Appendix 6 to the GIP)**	**Standard: SL0002, latest rev.**	**Standard: SL0002, latest rev.**

R2	The Transmission Owner's facility connection requirements shall address, but are not limited to, the following items:	R2.1	Provide a written summary of its plans to achieve the required system performance as described above throughout the planning horizon:			**Standard: PM3901 latest rev.**	
				R2.1.5	System protection and coordination.	**Standard: PM3901 latest rev.** **As specified in the Standard GIA (Appendix 6 to the GIP.)**	**Standard: SL0002, latest rev.**	**Standard: SL0002, latest rev.**
				R2.1.6	Metering and telecommunications.	**Standard: PM3901 latest rev., §5.10 and 5.11** **Metering equipment as specified in Article 7 of the Standard GIA (Appendix 6 to the GIP), Telecommunication equipment as specified in Article 8 of the Standard GIA (Appendix 6 to the GIP)**	**Standard: SL0002, latest rev.**	**Standard: SL0002, latest rev.**
				R2.1.7	Grounding and safety issues.	**Standard: PM3901 latest rev.** **Standard: SF0201, latest rev.** **Standard: SL0002, latest rev.**	**Standard: SF0201, latest rev.** **Standard: SL0002, latest rev.**	**Standard: SF0201, latest rev.** **Standard: SL0002, latest rev.**
				R2.1.8	Insulation and insulation coordination.	**Standard: TA0503 latest rev.**	**Standard: TA0503 latest rev.**	**Standard: TA0503 latest rev.**
				R2.1.9	Voltage, Reactive Power, and power factor control.	**Standard: PM3901 latest rev.** **Reactive power requirements are set forth in the Standard GIA (Appendix 6 to the GIP)** **Voltage Schedules**	**Voltage Schedules**	Typical industrial customer rate schedule, Section IV **Voltage Schedules**
				R2.1.10	Power quality impacts.	**Set forth in the Standard GIA (Appendix 6 to the GIP).** **Standard: AM3902, latest rev.**	**Standard: AM3902, latest rev.**	**Standard: AM3902, latest rev.**
				R2.1.11	Equipment Ratings.	**Standard: PM3901 latest rev.**	**Standard: SL0002, latest rev.**	**Standard: SL0002, latest rev.**

				R2.1.12	Synchronizing of facilities.	**Standard: PM3901 latest rev.** Interconnection Customer is responsible for the proper synchronization of the Generating Facility to the Transmission or Distribution System, as applicable.	N/A	N/A
				R2.1.13	Maintenance coordination.	Maintenance coordination shall be completed according to Article 10 of the Standard GIA (Appendix 6 to the GIP.)	Network Operating Agreement, Transmission Tariff, Attachment G, Section 7.6 (Page 17) **Standard: SL0002, latest rev.**	Typical Interconnection Agreement Typical Operating Agreement for Customer Owned Substations **Standard: SL0002, latest rev.**
				R2.1.14	Operational issues (abnormal frequency and voltages).	**Standard: PM3901 latest rev.** Conditions controlled according to Article 9.7.3 of the Standard GIA (Appendix 6 to the GIP)	Network Operating Agreement, Transmission Tariff, Attachment G, Section 7.1 (Page 13) and Section 7.3 (Page 13-14)	Typical industrial customer rate schedule, Section IV AM3902, Rev. 00, July 30, 1996, Voltage Fluctuations Operation Guideline, Section 3.1 (Page 2-3)
				R2.1.15	Inspection requirements for existing or new facilities.	**Standard: PM3901 latest rev.** Set forth in the Standard GIA (Appendix 6 to the GIP)	**Standard: SL0002, latest rev.** Network Operating Agreement, Transmission Tariff, Attachment G	**Standard: SL0002, latest rev.** Typical Operating Agreement for Customer Owned Substations
				R2.1.16	Communications and procedures during normal and emergency operating conditions.	**Standard: PM3901 latest rev.** Set forth in the Standard GIA (Appendix 6 to the GIP)	Typical Operating Agreement for Customer Owned Substations	Typical Operating Agreement for Customer Owned Substations
R3	The Transmission Owner shall maintain and update its facility connection requirements as required. The Transmission Owner shall make documentation of these requirements available to the users of the transmission system, the Regional Reliability Organization, and NERC on request (five business days).					Documents updated as necessary, placed on OASIS, and/or available to the RRO or NERC	Documents updated as necessary, placed on OASIS, and/or available to the RRO or NERC	Documents updated as necessary, placed on OASIS, and/or available to the RRO or NERC
SERC Supplement (Facility Connection Requirements)								
III	**Self Application:** Connection requirements for facilities (generation, transmission, and end-user) not presently connected and modifications of facilities already connected should be consistent in content and application to those requirements used by the Transmission Owners for connecting their own facilities.					Entergy Facility Connection Requirements Website	Entergy Facility Connection Requirements Website	Entergy Facility Connection Requirements Website

	Impact Study Requirements	1	Transmission Owners shall include a description of their procedures for study of new facilities and their impacts on the interconnected transmission system. The impact studies that should be considered include but are not limited to:	Fault Duty	The GIP describes the process and series of generation interconnections studies which are to be performed. The Facilities Study is customer specific and contains short circuit equipment rating information.	Entergy Facility Connection Requirements Website	Entergy Facility Connection Requirements Website
					A summary of information on ratings methodology can be found in the Entergy Transmission Facility Rating Methodology document which is derived from a number of Entergy proprietary standards.**Standard:AZ0203, latest rev.**		
					Standard: PM3901 latest rev.		
				Stability	GIP		
				Loadflow	GIP		
				Transfer Capability	GIP	Prior and approved transmission services are included in regional studies to prevent interconnections from harming existing transactions. Per good utility practice, transfer studies are done when warranted to identify any positive or negative impacts on transfer capabilities.	Prior and approved transmission services are included in regional studies to prevent interconnections from harming existing transactions. Per good utility practice, transfer studies are done when warranted to identify any positive or negative impacts on transfer capabilities.
					Standard: AM3901, latest rev., latest revision		
			The procedures should address coordinated joint studies with neighboring, interconnected Transmission Owners being necessary to completely evaluate the impact.		GIP	The TVA, Southern and Entergy Seams Working Group coordinate transmission studies through coordinated transmission planning and expansion, common generation interconnection processes, and interregional transmission planning and other coordination efforts among adjoining transmission organizations covering different regions. Questions may be directed to the Manager of Transmission Project Development.*	Changes to various types of loads are coordinated between Transmission (Transmission Planning and Transmission Policy) and either (1) major accounts staff and their retail customers or (2) wholesale customers. Changes are reflected in postings and models on the MISO OASIS site. Questions may be directed to the Manager of Transmission Project Development.*

					Standard: AM3901, latest rev.	Entergy Facility Connection Requirements Website Studies associated with interconnections other than large generators will be evaluated within the basic guidelines of Standard AM3901, latest rev.. However, the depth of study may be reduced or eliminated when appreciable impact on neighboring systems clearly does not exist.	Entergy Facility Connection Requirements Website Studies associated with interconnections other than large generators will be evaluated within the basic guidelines of Standard AM3901, latest rev.. However, the depth of study may be reduced or eliminated when appreciable impact on neighboring systems clearly does not exist.
	Provision for Future Changes	2	Planning requirements that should be addressed include:	Requirements for the facility owner or operator to notify the Transmission Owners when changes or modifications occur or are planned which may affect system operations or reliability	GIP	Entergy Facility Connection Requirements Website	Changes to various types of loads are coordinated between Transmission (Transmission Planning and Transmission Policy) and either (1) major accounts staff and their retail customers or (2) wholesale customers. Changes are reflected in postings and models on the MISO OASIS site. Questions may be directed to the Manager of Transmission Project Development.*
					Standard: PM3901 latest rev.		Entergy Facility Connection Requirements Website
				Requirements for conducting (or updating) system studies relating to facility changes/modifications, including the responsibility to furnish data to the Transmission Owner	GIP	Entergy Facility Connection Requirements Website	Changes to various types of loads are coordinated between Transmission (Transmission Planning and Transmission Policy) and either (1) major accounts staff and their retail customers or (2) wholesale customers. Changes are reflected in postings and models on the MISO OASIS site. Questions may be directed to the Manager of Transmission Project Development.*
					Standard: PM3901 latest rev.		
				Internal plant electrical system design (e.g., transformers, tap settings, motors & other loads, generator/exciter, voltage regulator) should not restrict	**Standard: PM3901 latest rev.**	**Voltage Schedules**	**Voltage Schedules**

				Voltage regulator) should not restrict any mode of project operation within the transmission system's allowable voltage range and regulation.	GIA	**Standard: AM3902, latest rev.**	**Standard: AM3902, latest rev.**
				Transmission interconnected equipment should have the tap ranges and selfregulation necessary to operate within the transmission system's voltage range and regulation.	**Standard: PM3901 latest rev.**	**Voltage Schedules**	**Voltage Schedules**
					GIA	**Standard: AM3902, latest rev.**	**Standard: AM3902, latest rev.**
				Voltage regulator load compensation, if required, to control voltage at a point beyond the generator terminals	**Standard: PM3901 latest rev.**	**Voltage Schedules**	**Voltage Schedules**
			Design requirements that should be addressed include:	Voltage regulator droop compensation, if required, for generators whose terminals are directly connected (i.e., cross-compound, hydro)	No requirements for these settings are currently required. Compliance with reactive support capability and voltage schedule requirements are adequate for all facilities connected.	No requirements for these settings are currently required. Compliance with reactive support capability and voltage schedule requirements are adequate for all facilities connected.	No requirements for these settings are currently required. Compliance with reactive support capability and voltage schedule requirements are adequate for all facilities connected.
				Coordination of excitation system settings with the Transmission Owner	**Standard: PM3901 latest rev.**	**Standard: SL0002, latest rev.**	**Standard: SL0002, latest rev.**
					GIA		
					Voltage Schedules	**Voltage Schedules**	**Voltage Schedules**
				Transmission interconnection impact on adjacent areas' voltage or reactive compensation devices	GIP	The TVA, Southern and Entergy Seams Working Group plans to publish procedures for coordinated joint studies; (Entergy will publish a standard based on the current draft of the Seams Groups documentation also). Questions may be directed to the Manager of Transmission Project Development.*	The TVA, Southern and Entergy Seams Working Group plans to publish procedures for coordinated joint studies; (Entergy will publish a standard based on the current draft of the Seams Groups documentation also). Questions may be directed to the Manager of Transmission Project Development.*
	Voltage and Power Factor Control	3		Load and/or generation operation within the acceptable voltage range and regulation as specified by the Transmission Owner	**Standard: PM3901 latest rev.**	Typical Operating Agreement for Customer Owned Substations	Typical Operating Agreement for Customer Owned Substations
						Voltage Schedules	**Voltage Schedules**
					GIA	**Standard: AM3902, latest rev.**	**Standard: AM3902, latest rev.**
				Excitation system/voltage regulator allowable operating modes (e.g.,	**Standard: PM3901 latest rev.**	Typical Operating Agreement for	Typical Operating Agreement for Customer Owned Substations

			Operational requirements that should be addressed include:	automatic/manual)	GIA	Customer Owned Substations	**Standard: AM3902, latest rev.**
				Generator voltage schedules	**Voltage Schedules**	**Voltage Schedules**	**Voltage Schedules**
					Standard: PM3901 latest rev.		
				Coordination of any reactive compensation devices	**Standard: PM3901 latest rev.**	Typical Operating Agreement for Customer Owned Substations	Typical Operating Agreement for Customer Owned Substations
					GIA	Entergy Facility Connection Requirements Website	Entergy Facility Connection Requirements Website
	Generation Control	4	Design requirements that should be addressed include:	Load following capability	**Standard: PM3901 latest rev.**	N/A	N/A
				AGC	**Standard: PM3901 latest rev.**	N/A	N/A
				Reactive power output	**Standard: PM3901 latest rev.**	Typical Operating Agreement for Customer Owned Substations	Typical Operating Agreement for Customer Owned Substations
					GIA	Entergy Facility Connection Requirements Website	Entergy Facility Connection Requirements Website
				Minimum operating capability	GIA	Typical Operating Agreement for Customer Owned Substations	Typical Operating Agreement for Customer Owned Substations
				Remote control functions	Facilities requesting remote control functions for any aspect of facility operations would be evaluated under Section 8 of the GIA and Appendix F §4.7 of the Facility Connection Requirements	Facilities requesting remote control functions for any aspect of facility operations would be evaluated under section 8 of the GIA and Appendix F §4.7 of the Facility Connection Requirements	Facilities requesting remote control functions for any aspect of facility operations would be evaluated under section 8 of the GIA and Appendix F §4.7 of the Facility Connection Requirements
				Coordination of generation control system settings	**Standard: PM3901 latest rev.**	**Standard: SL0002, latest rev.**	**Standard: SL0002, latest rev.**
				Load shedding	**Standard: PM3901 latest rev.**	Typical Operating Agreement for Customer Owned Substations	Typical Operating Agreement for Customer Owned Substations
					GIA		
				Black start capability	GIA	If Applicable, Black Start Requirements and Capabilities are Addressed in the Interconnection and Operating Agreement	If Applicable, Black Start Requirements and Capabilities are Addressed in the Interconnection and Operating Agreement
					If Applicable, Black Start Requirements and Capabilities are Addressed in the Interconnection and Operating Agreement		
				Operation at 60Hz nominal	**Standard: PM3901 latest rev.**	**Standard: SL0002, latest rev.**	**Standard: SL0002, latest rev.**
				Mode of frequency control	GIA	**Standard: SL0002, latest rev.**	**Standard: SL0002, latest rev.**
					Standard: PM3901 latest rev.		

			Operational requirements that should be addressed include:	Operation of generators during frequency decline conditions	GIA	N/A	N/A
				Coordination between generator controls and underfrequency load shedding programs	**Standard: PM3901 latest rev.**	N/A	N/A
				Speed droop setting	**N/A**	N/A	N/A
				Responsibility for coordination with the appropriate operating entity.	**Standard: PM3901 latest rev.**	Typical Operating Agreement for Customer Owned Substations	Typical Operating Agreement for Customer Owned Substations
	Short Circuit Conditions	5	Design requirements that should be addressed include:	Short circuit capabilities of current carrying elements	**Standard: PM3901 latest rev.**	**Standard: SL0002, latest rev.**	**Standard: SL0002, latest rev.**
				Ratings of interrupting devices	**Standard: PM3901 latest rev.**	**Standard: SL0002, latest rev.**	**Standard: SL0002, latest rev.**
				Relay and device coordination with existing system protection	**Standard: PM3901 latest rev.**	**Standard: SL0002, latest rev.**	**Standard: SL0002, latest rev.**
				Existing and planned future fault current levels	**Standard: PM3901 latest rev.**	**Standard: SL0002, latest rev.**	**Standard: SL0002, latest rev.**
				Responsibility for required changes in existing facilities due to increased fault currents (Generator and Transmission Projects only)	**Standard: PM3901 latest rev.**	**Standard: SL0002, latest rev.**	N/A
				Safety of the general public	**Standard: PM3901 latest rev.**	**Standard: SL0002, latest rev.**	**Standard: SL0002, latest rev.**
					Entergy Facility Connection Requirements Website	Entergy Facility Connection Requirements Website	Entergy Facility Connection Requirements Website
				Dynamic stability and the use of power system stabilizers - SERC recommends that power system stabilizers be utilized for certain conditions identified in Attachment 2.	**Standard: PM3901 latest rev.**	N/A	N/A
				Prevention/minimization of equipment damage	**Standard: PM3901 latest rev.**	**Standard: SL0002, latest rev.**	**Standard: SL0002, latest rev.**
				Minimization of equipment outage time	**Standard: SL0002, latest rev.**	**Standard: SL0002, latest rev.**	**Standard: SL0002, latest rev.**
				Minimization of system outage area	**Standard: SL0002, latest rev.**	**Standard: SL0002, latest rev.**	**Standard: SL0002, latest rev.**
				Minimization of system voltage disturbances	**Standard: SL0002, latest rev.**	**Standard: SL0002, latest rev.**	**Standard: SL0002, latest rev.**
				Maintenance of protective system coverage for abnormal conditions	GIA	Typical Operating Agreement for Customer Owned Substations	Typical Operating Agreement for Customer Owned Substations

	System Protection and Other Controls	6	Design and Operational requirements that should be addressed include:	Performance of all appropriate studies: grounding, short circuit, stability, power quality, and coordination of protective devices	The GIP describes the process and series of generation interconnections studies which are to be performed. The Facilities Study is customer specific and contains short circuit equipment rating information.	Entergy Facility Connection Requirements Website	Entergy Facility Connection Requirements Website
					Standard: PM3901 latest rev.		
				Specification of RTU protocols and other communication channels	**Standard: SL0002, latest rev.**	**Standard: SL0002, latest rev.**	**Standard: SL0002, latest rev.**
				Coordination of remote trip schemes, underfrequency load shedding schemes, undervoltage load shedding schemes and special protective systems should be required whether in the same Balancing Authority Area or different Balancing Authority Areas.	**Standard: PM3901 latest rev.**	**Standard: SL0002, latest rev.**	**Standard: SL0002, latest rev.**
					GIA	Entergy Facility Connection Requirements Website	Entergy Facility Connection Requirements Website
					Determined through good engineering judgement and good utility practice during the Project Scoping and Project Execution Phases of PM&C's project management process.	Determined through good engineering judgement and good utility practice during the Project Scoping and Project Execution Phases of PM&C's project management process. Interconnecting parties may be subject to load interruption schemes including frequency, voltage, or other special schemes. Such participation is agreed to and discussed during scoping meetings.	Determined through good engineering judgement and good utility practice during the Project Scoping and Project Execution Phases of PM&C's project management process. Interconnecting parties may be subject to load interruption schemes including frequency, voltage, or other special schemes. Such participation is agreed to and discussed during scoping meetings.
			Generation specific facility requirements that should be addressed include:	Synchronizing with the transmission system	**Standard: PM3901 latest rev.**	N/A	N/A
				Parallel operation with the transmission system	**Standard: PM3901 latest rev.**	Entergy Facility Connection Requirements Website	Entergy Facility Connection Requirements Website
						Typical Interconnection Agreement	Typical Interconnection Agreement
						Typical Operating Agreement for Customer Owned Substations	Typical Operating Agreement for Customer Owned Substations
						Standard: SL0002, latest rev.	**Standard: SL0002, latest rev.**
				Islanding	**Standard: PM3901 latest rev.**	N/A	N/A
			Typical metering data requirements could include the	kW	**Standard: PM3901 latest rev.**	**Standard: SL0002, latest rev.**	**Standard: SL0002, latest rev.**
				kWh			
				kVAR, leading and lagging			
				kVAR-hour			

			following:	kV2-hour			
				voltage (to monitor voltage schedule compliance)			
	Telemetering and Metering	7	Design requirements that should be addressed include:	Loss compensation	**Standard: PM3901 latest rev.**	**Standard: SL0002, latest rev.**	**Standard: SL0002, latest rev.**
				Bi-directionality			
				Metering accuracy			
				Ancillary equipment specifications (e.g., CT's, PT's)			
				Provisions for maintenance and calibration			
				Data protocol			
				Mode of data transmission (e.g. fiber optic cable, phone line)			
				Provisions for maintaining continuity and meeting reliability criteria			
	Supervisory Control and Data Acquisition (SCADA)	8	Typical data requirements could include the following:	Status of interrupting devices	**Standard: PM3901 latest rev.**	**Standard: SL0002, latest rev.**	**Standard: SL0002, latest rev.**
				MW flow			
				MVAR flow			
				Voltage at interconnection point			
			Design requirements that should be addressed include:	Communication protocol			
				Mode of data transmission (e.g. fiber optic cable, phone line)			
				Control functionality (breakers, switches, etc.)			
				Provisions for maintaining continuity and meeting reliability criteria (e.g., dual DC sources, dual port RTUs)			
	System Grounding	9	Design requirements that should be addressed include:	Grounding study	**Standard: SL0002, latest rev.**	**Standard: SL0002, latest rev.**	**Standard: SL0002, latest rev.**
				Compatibility with Transmission Owner's system	**Standard: SF0201, latest rev.**	**Standard: SF0201, latest rev.**	**Standard: SF0201, latest rev.**
				Construction techniques and inspection requirements (if any) of the Transmission Owner	**Standard: SF0202, latest rev.**	**Standard: SF0202, latest rev.**	**Standard: SF0202, latest rev.**
				Testing	Testing conducted as needed or when operational data suggests testing is warranted	Testing conducted as needed or when operational data suggests testing is warranted	Testing conducted as needed or when operational data suggests testing is warranted
					Standard: SF0101, latest rev.	**Standard: SF0101, latest rev.**	**Standard: SF0101, latest rev.**
				Periodic maintenance	Testing conducted as needed or when testing suggests maintenance is warranted	Testing conducted as needed or when testing suggests maintenance is warranted	Testing conducted as needed or when testing suggests maintenance is warranted
					Standard: SF0101, latest rev.	**Standard: SF0101, latest rev.**	**Standard: SF0101, latest rev.**
				Personnel safety considerations	**Standard: SL0002, latest rev.**	**Standard: SL0002, latest rev.**	**Standard: SL0002, latest rev.**

				Interconnection of grounding system to Transmission Owner grounding system(s)	**Standard: SF0201, latest rev.**	**Standard: SF0201, latest rev.**	**Standard: SF0201, latest rev.**
					Standard: SF0202, latest rev.	**Standard: SF0202, latest rev.**	**Standard: SF0202, latest rev.**
				Transmission line shielding provisions	**Standard: TF0401, latest rev.**	**Standard: TF0401, latest rev.**	**Standard: TF0401, latest rev.**
				Arrester applications	**Standard: SA0102, latest rev.**	**Standard: SA0102, latest rev.**	**Standard: SA0102, latest rev.**
				Cathodic protection	**Standard: TF0501, latest rev.**	**Standard: TF0501, latest rev.**	**Standard: TF0501, latest rev.**
	Equipment Ratings	10	Design requirements that should be addressed include:	Identification of general design parameters and practices of Transmission Owner (e.g., shielding, attachment details, surge protection, current-carrying elements, basic insulation levels, etc.)	**Standard: PM3901, latest rev.**	**Standard: SL0002, latest rev.**	**Standard: SL0002, latest rev.**
					Standard: SL0002, latest rev.		
					Standard: SF0201, latest rev.	**Standard: SF0201, latest rev.**	**Standard: SF0201, latest rev.**
					Standard: SF0202, latest rev.	**Standard: SF0202, latest rev.**	**Standard: SF0202, latest rev.**
					Standard: TF0401, latest rev.	**Standard: TF0401, latest rev.**	**Standard: TF0401, latest rev.**
					Other applicable Standards	Other applicable Standards	Other applicable Standards
				Provision for Transmission Owner review of facility design and specifications	GIA	**Standard: SL0002, latest rev.**	**Standard: SL0002, latest rev.**
				References to applicable industry standards (e.g., ANSI/IEEE) for equipment provided by applicant in connection with project	GIA	**Standard: SL0002, latest rev.**	**Standard: SL0002, latest rev.**
				Special requirements due to atmospheric, geological, seismic, or environmental conditions	Determined through good engineering judgement and good utility practice during the Project Scoping and Project Execution Phases of PM&C's project management and EPC processes.	Determined through good engineering judgement and good utility practice during the Project Scoping and Project Execution Phases of PM&C's project management and EPC processes.	Determined through good engineering judgement and good utility practice during the Project Scoping and Project Execution Phases of PM&C's project management and EPC processes.
				Responsibility for changes to existing transmission system made necessary by the project	Entergy Facility Connection Requirements Website	Entergy Facility Connection Requirements Website	Entergy Facility Connection Requirements Website
					GIA	Typical Interconnection Agreement	Typical Interconnection Agreement
						Typical Operating Agreement for Customer Owned Substations	Typical Operating Agreement for Customer Owned Substations
				Internal plant systems design (e.g., transformer rating/taps/impedance, cooling systems, generator/exciter rating) should not limit continuous reactive capability.	**Standard: PM3901 latest rev.**	**Standard: SL0002, latest rev.**	**Standard: SL0002, latest rev.**
					GIA	**Standard: AM3902, latest rev.**	**Standard: AM3902, latest rev.**

	Reactive Power Requirements	11	Design requirements that should be addressed include:	Transmission interconnected equipment should have the tap ranges and selfregulation necessary to accommodate the transmission system's reactive power flow requirements.	**Standard: PM3901 latest rev.**	**Standard: SL0002, latest rev.**	**Standard: SL0002, latest rev.**
					GIA	**Standard: AM3902, latest rev.**	**Standard: AM3902, latest rev.**
				Load power factor	The Electric Service Agreement or comparable agreement (MW capacity and MVAR billing).	The Electric Service Agreement or comparable agreement (MW capacity and MVAR billing).	The Electric Service Agreement or comparable agreement (MW capacity and MVAR billing).
				Generator power factor	GIA	N/A	N/A
				Load equivalent sources of reactive power, if acceptable	Load equivalent sources are addressed during facility studies and evaluated for effectiveness and compliance with NERC and SERC reliability standards.	Load equivalent sources are addressed during facility studies and evaluated for effectiveness and compliance with NERC and SERC reliability standards.	Load equivalent sources are addressed during facility studies and evaluated for effectiveness and compliance with NERC and SERC reliability standards.
				Generator equivalent sources of reactive power, if acceptable	Generator equivalent sources are addressed during facility studies and evaluated for effectiveness and compliance with NERC and SERC reliability standards.	Generator equivalent sources are addressed during facility studies and evaluated for effectiveness and compliance with NERC and SERC reliability standards.	Generator equivalent sources are addressed during facility studies and evaluated for effectiveness and compliance with NERC and SERC reliability standards.
				Transmission interconnections impact on adjacent areas' reactive power flow requirements	GIP	Entergy Facility Connection Requirements Website	Entergy Facility Connection Requirements Website
					Standard: AM3901, latest rev.		
			Operational requirements that should be addressed include:	Testing to verify reactive support capability per NERC Reliability Standards	GIP	N/A	N/A
				Generator step-up transformer (GSU) tap changes as necessary to meet voltage schedule and reactive support requirements	**Standard: PM3901 latest rev.**	**Standard: AM3902, latest rev.**	**Standard: AM3902, latest rev.**
					GIA		
				Range of generator continuous rated MW output associated with reactive support capability (e.g., > 10 MW)	GIA	Typical Interconnection Agreement	Typical Interconnection Agreement
						Typical Operating Agreement for Customer Owned Substations	Typical Operating Agreement for Customer Owned Substations

						Standard: SL0002, latest rev.	**Standard: SL0002, latest rev.**
	Power Quality	12	Design requirements that should be addressed include:				
			Power quality studies to define acceptable operating ranges and limits. Studies may include, but not be limited to:	Voltage Unbalance	**Standard: AM3902, latest rev.**	**Standard: AM3902, latest rev.**	**Standard: AM3902, latest rev.**
				Voltage Flicker	**Standard: AM3902, latest rev.**	**Standard: AM3902, latest rev.**	**Standard: AM3902, latest rev.**
				Voltage Fluctuation	**Standard: AM3902, latest rev.**	**Standard: AM3902, latest rev.**	**Standard: AM3902, latest rev.**
				Harmonic Distortion	GIA	**Standard: AM3902, latest rev.**	**Standard: AM3902, latest rev.**
				Transient Overvoltage	GIA	**Standard: AM3902, latest rev.**	**Standard: AM3902, latest rev.**
				Temporary Overvoltage	**Standard: AM3902, latest rev.**	**Standard: AM3902, latest rev.**	**Standard: AM3902, latest rev.**
				Temporary Undervoltage	**Standard: AM3902, latest rev.**	**Standard: AM3902, latest rev.**	**Standard: AM3902, latest rev.**
				Insulation Coordination	**Standard: SA0102, latest rev.**	**Standard: SA0102, latest rev.**	**Standard: SA0102, latest rev.**
				Operating Frequency	**Standard: PM3901 latest rev.**	**Standard: SL0002, latest rev.**	**Standard: SL0002, latest rev.**
				Power Factor Range	GIA	**Standard: SL0002, latest rev.**	**Standard: SL0002, latest rev.**
					Standard: PM3901 latest rev.		
				Interruption/Outage Frequency	GIA	Typical Interconnection Agreement	Typical Interconnection Agreement
						Typical Operating Agreement for Customer Owned Substations	Typical Operating Agreement for Customer Owned Substations
			Studies may identify additional equipment necessary to meet power quality standards.		Feasibility, Impact, or Facilities Studies, or Operating History May Suggest Equipment to be Necessary	Feasibility, Impact, or Facilities Studies, or Operating History May Suggest Equipment to be Necessary	Feasibility, Impact, or Facilities Studies, or Operating History May Suggest Equipment to be Necessary
			Operational requirements that should be addressed include:	Connection of a generator, transmission facility, or end-user load to a Transmission Owner's system should not unacceptably compromise or degrade the power quality of existing customers.	GIA		
					Standard: AM3902, latest rev.	**Standard: AM3902, latest rev.**	**Standard: AM3902, latest rev.**
				Installation of power quality monitoring equipment by the Transmission Owner to verify facility owner/operator compliance with power quality performance requirements	If Feasibility, Impact, or Facilities Studies, or Operating History Suggest Equipment May Be Necessary	If Feasibility, Impact, or Facilities Studies, or Operating History Suggest Equipment May Be Necessary	If Feasibility, Impact, or Facilities Studies, or Operating History Suggest Equipment May Be Necessary
				The responsibility associated with synchronizing generation and transmission facilities to the power system.	**Standard: PM3901 latest rev.**	N/A	N/A

Synchronizing Facilities	13	Design and Operational requirements that should be addressed include:	Required communications necessary between the Transmission Owner/Operator and the generation/transmission facility operator.	**Standard: PM3901 latest rev.**	N/A	N/A
			Synchronizing equipment	**Standard: PM3901 latest rev.**	N/A	N/A
			Test plans	GIA	Operating Agreements for Customer Owned Substations would include testing requirements, if necessary	Operating Agreements for Customer Owned Substations would include testing requirements, if necessary
			Applicable reclosing requirements and prohibitions for generation and transmission facilities	**Standard: PM3901 latest rev.**	**Standard: SL0002, latest rev.**	**Standard: SL0002, latest rev.**
			Remote synchronizing capability for facilities	**Standard: PM3901 latest rev.**	**Standard: SL0002, latest rev.**	**Standard: SL0002, latest rev.**
Maintenance Coordination	14	Operational requirements that should be addressed include:	Definition of maintenance programs, responsibilities and performance objectives	GIA	Typical Operating Agreement for Customer Owned Substations	Typical Operating Agreement for Customer Owned Substations
				Standard: PM3901 latest rev.		
			Authorization, notification and clearances for work	GIA	Typical Operating Agreement for Customer Owned Substations	Typical Operating Agreement for Customer Owned Substations
			Generation: Such planning should take into account unit commitment obligations, replacement power, and / or contractual obligations.	SOC coordinates maintenance activities of all generation within the Balancing Authority per GIA Articles 9.7.1 and 10.3.	N/A	N/A
				Application: AORS		
			End-Users: The maintenance practices of the end-user on their transmission connected equipment should be performed at a level that ensures the reliability of the interconnected transmission system.	N/A	N/A	**Application: AORS**
				N/A	N/A	Typical Operating Agreement for Customer Owned Substations
			Transmission Interconnections: Requirements (if any) for advanced publication of maintenance schedules, including any need to observe limitations imposed by generation maintenance and dispatch schedules, maintenance of associated facilities, transmission transaction schedules, area protection or voltage requirements.	N/A	**Application: AORS**	N/A
					Typical Operating Agreement for Customer Owned Substations	

Maintenance Requirements	15	Operational requirements that should be addressed include:				
		The facility owner/operator is responsible for the regularly scheduled calibration and/or maintenance of its equipment, including, but not limited to:	Circuit breakers	GIA	Typical Operating Agreement for Customer Owned Substations	Typical Operating Agreement for Customer Owned Substations
			Generators			
			Power transformers			
			Protective relays			
			Revenue metering			
			Communications			
			Trip circuits			
			Interrupters			
			Power DC sources			
			Grounding system			
			Transmission facilities			
		The maintenance practices of the generator and transmission facility owner/operator, and end-user on their transmission-connected equipment shall be performed at a level that ensures the reliability and continuity of service of the interconnected transmission system. Relevant maintenance records should be maintained.		**Standard: PM3901 latest rev.**	Typical Operating Agreement for Customer Owned Substations	Typical Operating Agreement for Customer Owned Substations
Abnormal Frequency and Voltage Operation	16	Design requirements that should be addressed include:	Consideration for abnormal voltage conditions	GIA	Typical Operating Agreement for Customer Owned Substations	Typical Operating Agreement for Customer Owned Substations
			Consideration for abnormal frequency conditions	GIA	Typical Operating Agreement for Customer Owned Substations	Typical Operating Agreement for Customer Owned Substations
			Consideration for generators connected through a tapped transmission line (e.g., islanding)	**Standard: PM3901 latest rev.**	N/A	N/A
			Relay coordination to maintain stability	GIA	**Standard: SL0002, latest rev.**	**Standard: SL0002, latest rev.**
				Standard: PM3901 latest rev.	**Standard: SL0002, latest rev.**	**Standard: SL0002, latest rev.**
			Load shedding implementation	GIA	Typical Operating Agreement for Customer Owned Substations	Typical Operating Agreement for Customer Owned Substations
			Provisions for abnormal voltage conditions	GIA	Typical Operating Agreement for Customer Owned Substations	Typical Operating Agreement for Customer Owned Substations
			Provisions for abnormal frequency conditions	GIA	Typical Operating Agreement for Customer Owned Substations	Typical Operating Agreement for Customer Owned Substations
			Provisions for load shedding	GIA	Typical Operating Agreement for Customer Owned Substations	Typical Operating Agreement for Customer Owned Substations

			Operational requirements that should be addressed include:	Special procedures for coordination	If during study phase, scoping phase, or execution phase, conditions are discovered which may require special procedures for coordination of protection or control systems, such agreements are adopted into the operating agreement	If during study phase, scoping phase, or execution phase, conditions are discovered which may require special procedures for coordination of protection or control systems, such agreements are adopted into the operating agreement	If during study phase, scoping phase, or execution phase, conditions are discovered which may require special procedures for coordination of protection or control systems, such agreements are adopted into the operating agreement
	Inspection Requirements	17	Operational requirements that should be addressed include:	Initial (pre-operational) inspection and approval by the Transmission Owner and/or copies of pre-operational test reports to be provided to the Transmission Owner. Include any requirements for approval by the Transmission Owner prior to commercial operation and options of the Transmission Owner to specify additional testing.	**Standard: PM3901 latest rev.**	**Standard: SL0002, latest rev.**	**Standard: SL0002, latest rev.**
					GIA		
				If applicable, required right of access to the facility by the Transmission Owner for purposes of conducting inspections, observing tests, and auditing records required by NERC standards and established reporting procedures.	**Standard: PM3901 latest rev.**	**Standard: SL0002, latest rev.**	**Standard: SL0002, latest rev.**
					GIA		
				Requirements for facility owner/operator to modify operations to reasonably comply with Transmission Owner testing requirements.	GIA	Typical Operating Agreement for Customer Owned Substations	Typical Operating Agreement for Customer Owned Substations
				Provision for a point of contact Each generation and transmission facility operator and end-user facility shall include a provision for establishing a contact person for communications with the appropriate operating entity. This contact person shall have the authority and capability to operate the facilities according to the instructions of the appropriate operating entity.	GIA	Typical Operating Agreement for Customer Owned Substations	Typical Operating Agreement for Customer Owned Substations
					Standard: PM3901 latest rev.		

	Communications During Normal and Emergency Conditions	18	Operational requirements that should be addressed include:	Provision to obtain required approval All Generator Operators shall have provisions to obtain required approval from the appropriate operating entity prior to starting generation and connecting to the transmission system. All Transmission Operators shall obtain proper clearances from the appropriate operating entity before commencing any work on the transmission facilities.	**Standard: PM3901 latest rev.**	N/A	N/A
				Provision for reliable communication All Generator Operators and all Transmission Operators shall have a provision for reliable communications with the appropriate operating entity. In addition, all Transmission Operators shall have provisions for reliable communications with other Transmission Operators as appropriate.	GIA	**Standard: SL0002, latest rev.**	**Standard: SL0002, latest rev.**
	Responsibilities During Emergency Conditions	19	The generation and transmission facility operators and end-users shall communicate with and shall cooperate with the appropriate operating entity to support the recovery efforts during emergency conditions. This may include, but may not be limited to (as appropriate):	Switching operations	GIA	Typical Operating Agreement for Customer Owned Substations	Typical Operating Agreement for Customer Owned Substations
				VAR support	GIA		
				Adjustments in real or reactive generation net output	GIA		
				Tripping of generating unit(s)	GIA		
				Starting of generating unit(s) including black start units	GIA		
				Implementation of emergency communication procedures	**Standard: PM3901 latest rev.**		
					GIA		
				Transmission facility restoration efforts	GIA		