

Facility Interconnection Requirements and Study Procedures

Northeast Louisiana Power Cooperative, Inc.

Facility Interconnection Requirements and Study Procedures

NERC Reliability Standards

FAC-001-4

FAC-002-4

Effective Date: January 1, 2024
Version 3.0

Facility Interconnection Requirements and Study Procedures

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1.0 INTRODUCTION

This procedure shall ensure Northeast Louisiana Power Cooperative's (NELPCO's) compliance with North American Electric Reliability Corporation (NERC) Reliability Standards that address Facility Interconnection requirements and Study procedures. These standards address interconnection requirements and study procedures for new or materially modified Generation facilities, Transmission facilities, and End- user facilities. NELPCO's Facility Interconnection Requirements and Study Procedures are designed to ensure compliance with applicable NERC and SERC Regional Reliability Standard Requirements.

The following NERC Reliability Standards are addressed by this procedure:

Standard	Title
FAC-001-4	Facility Interconnection Requirements
FAC-002-4	Facility Interconnection Studies

NELPCO is a electric power cooperative serving members in a service territory that runs from south of Turkey Creek Lake in Franklin Parish north to the Arkansas line and extends into Morehouse Parish.

This document explains the procedures to follow when requesting an interconnection with the NELPCO transmission system. It is intended to be a guide for the prompt processing of interconnection requests. It should be noted that an *interconnection* with NELPCO's transmission system does not guarantee *transmission* service or capacity on NELPCO's system.

NELPCO's Transmission System is the 115kV bus work and associated air breakers at the Baskin Substation. This includes the 4-inch tubular aluminum bus work and five switches numbered R4574, R2996, R1373, R0156 and R3817.

All interconnection requests that seek to interconnect with the NELPCO Transmission System, should be sent to the following mailing address or email address:

Mr. Jeff Churchwell
General Manager
PO Box 1577
Winnsboro, LA 71295
Email: jchurchwell@nelpco.coop

All interconnection customers shall comply with all applicable NERC Reliability Standard Requirements mandated by FERC, pursuant to Section 215 of the Federal Power Act.

These requirements shall be the minimum requirements necessary for processing interconnection requests. There may be additional requirements depending on the

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location characteristics, or planned usage of the proposed interconnection facility and those requirements shall be addressed on a case-by-case basis.

2.0 **INTERCONNECTION REQUIREMENTS AND STUDY PROCEDURES FOR GENERATION, TRANSMISSION, AND END-USER FACILITIES²**

All requests for interconnection to the NELPCO transmission system shall be consistent with NERC Reliability Standards, SERC Requirements, and NELPCO standard utility practices. A proposed interconnection or modification of an existing interconnection for Generation, Transmission, or End-user facilities shall not degrade the reliability or operating flexibility of the existing transmission system.

All arrangements for system studies, engineering design, construction, ownership, operations, maintenance, replacement equipment, metering, facility controls, and telecommunications shall be set forth in written contracts between NELPCO and the requesting party.

Per Requirements R3 and R4 of FAC-002-4, when entities are seeking to interconnect new transmission Facilities or electricity end-user Facilities, or to materially modify existing interconnections of transmission Facilities or electricity end-user Facilities, NELPCO will coordinate and cooperate on these studies with its Transmission Planner or Planning Coordinator, the interconnecting party, and any third-party entities associated with the applicable organizations related to the interconnection request.

The following can be part of the studies required for NELPCO to coordinate and cooperate, although other studies may be required by the Planning Coordinator or the Transmission Planner:

- a. The reliability impact of the new interconnection, or existing interconnection seeking to make a qualified change as defined by the Planning Coordinator under Requirement R6 of FAC-003-3, on affected system(s);
- b. Adherence to applicable NERC Reliability Standards; regional and Transmission Owner planning criteria; and Facility interconnection requirements;
- c. Steady-state, short-circuit, and dynamics studies, as necessary, to evaluate system performance under both normal and contingency conditions; and
- d. Study assumptions, system performance, alternatives considered, and coordinated recommendations. While these studies may be performed independently, the results shall be evaluated and coordinated by the entities involved.

The costs associated with facility connections and all associated Network Upgrades as identified in applicable studies shall be the responsibility of the requesting party unless otherwise specified in the agreement between NELPCO and the applicant. NELPCO reserves the right to participate in the costs and ownership of proposed facility expansions that result in mutually advantageous alternatives or which provide benefits to regional reliability. All costs associated with environmental activities for new facilities shall be the responsibility of the requesting party. Advance funds or deposits may be

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required by NELPCO prior to any work being performed.

The following requirements and procedures shall be satisfied by any entity seeking to connect Generation, Transmission, and/or End-user facilities to the NELPCO transmission system. NELPCO shall manage the interconnection process, through all the following steps.

2.1. Procedures for coordinated studies for new interconnections or existing interconnections seeking to make a qualified change as defined by the Planning Coordinator and their impacts on affected systems. (FAC-001-4, R3.1)

- 2.1.1. Entities seeking to connect Generation, Transmission, or End-user facilities shall work cooperatively with NELPCO in conducting studies of the new facilities and their impacts on the interconnected transmission system.
- 2.1.2. A System Impact Study shall be required to evaluate the electrical system performance of the transmission system with the requested facility connection (and alternatives) and to demonstrate adherence to established reliability criteria, including applicable NERC, SERC and MISO Reliability Standards and their specific requirements, and NELPCO criteria and these Facility Interconnection Requirements.³
- 2.1.3. After acceptable completion of the System Impact Study, a Facilities Study shall be required to determine the detailed facility interconnection requirements. The Facilities Study shall identify direct assignment facilities, network upgrades, cost estimates, and typical construction requirements. All costs to conduct or review System Impact Studies and Facility Studies are the responsibility of the requesting party. Assumptions used in the performance of the studies shall be coordinated with entities and determined on a case-by-case basis and documented within the study reports.
- 2.1.4. Studies evaluating the impacts of new or modified Generation, Transmission, or End-user facilities shall be conducted utilizing analytical tools and databases approved or deemed acceptable by NELPCO, SERC and MISO.
- 2.1.5. The scope of studies to be conducted may include, but shall not be limited to, steady-state power flow analysis, post-transient analysis, dynamic stability analysis, Electro-Magnetic Transients Program (EMTP) analysis, and short-circuit analysis to ensure compliance with all applicable NERC, SERC and NELPCO standards and requirements. All studies shall include normal and contingency conditions. Such study scope shall be as mutually

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agreed upon by NELPCO and the entity seeking to connect Generation, Transmission, or End-user facilities.

- 2.1.6. Evaluation of alternatives to the requested facility connection, such as lower voltage construction, alternative interconnection points, or upgraded facilities, may be required by NELPCO.
- 2.1.7. A list of alternative interconnection points or upgrades considered and the reasoning for the selection of the recommended alternative shall be documented in the interconnection study report.
- 2.1.8. If no alternatives for interconnection points or upgrades are studied, the reason for not considering alternatives shall be documented in the interconnection study report.
- 2.1.9. Steady-state power flow analysis shall require load and resource growth projections as applicable. MW and MVAR capacity and demand at the point of interconnection and voltage level are required. If the studies indicate that additions or upgrades to the existing transmission system are necessary, NELPCO shall conduct or review facilities studies, at the expense of the requesting entity, to determine the cost of additions or upgrades and the required timeframe for implementing system additions or upgrades.
- 2.1.10. The transmission planning process for a proposed new facility connection shall also include coordinated joint studies with internal and external entities, if necessary. As applicable, NELPCO will adhere to its executed participation agreements with the sub-regional planning groups as necessary, which require and provide for the coordination of joint studies.
- 2.1.11. NELPCO shall ensure that the Interconnecting Customer's new or materially modified existing interconnections are within a Balancing Authority Area's metered boundary.
- 2.1.12. Copies of email correspondence between NELPCO and the Interconnecting Customer, or other external planning entities shall be archived if it relates to coordination of new or modified transmission or generation facilities.

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2.1.13. In all interconnection studies, NELPCO shall monitor neighboring systems for criteria violations, such as overloads or voltage criteria violations, to determine if the proposed facilities result in any impacts on neighboring systems. All interconnection reports should document the impacts on neighboring systems or document that no such impacts were identified.⁹ Any potentially affected systems will be given the opportunity to participate in the studies.

2.1.14. The Interconnection Customer shall be responsible for resolving any impacts on affected entities prior to interconnection.

2.1.15. NELPCO will ensure that all affected entities identified in the interconnection study are notified and copied on the study report.

2.1.16. Results of all coordinated joint studies shall be documented along with any conclusions and recommendations. Such documentation shall be retained by NELPCO and shall be made available if requested by NERC, SERC, or any other entities responsible for the reliability of the interconnected transmission system as prescribed within forty-five business days.

2.2. Procedures for notifying those responsible for the reliability of affected system(s) of new interconnections or existing interconnections seeking to make a qualified change. (FAC-001-4, R3.2)

2.2.1. NELPCO shall be responsible for the dissemination of notifications for new or modified interconnections, as appropriate to the Planning Authorities (Planning Coordinator, Transmission Planner), SERC, MRO, and NERC as soon as feasible and in accordance with notification procedures that such entities have established.

2.2.2. In addition, NELPCO will ensure that the following organizations are notified of a new or modified interconnection, as applicable:

- MISO
- Entergy
- Cleco Cajun

2.3. Procedures for confirming with those responsible for the reliability of affected systems that new or materially modified Facilities are within a Balancing Authority Area's metered boundaries. (FAC-001-4, R3.3)

2.3.1. NELPCO shall be responsible for the dissemination of notifications for new or modified interconnections, as appropriate to the Balancing Authority for its system, MISO BA.

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- 2.3.2. NELPCO will make this notification within 45 days of the receipt of the application of interconnection. This notification will request that MISO BA confirm the location of the new or materially modified Facilities is within the MISO BA metered boundary.
- 2.3.3. NELPCO may also request confirmation that the point of interconnection is within a MISO Local Balancing Authority's metered boundary as well, if applicable.
- 2.3.4. NELPCO will retain the response from the MISO BA and LBAs as evidence.

3.0 NELPCO Facility Interconnection Requirements

3.1. Transmission System Facility Connections (FAC-001-4, R1)

- 3.1.1. An applicant requesting transmission interconnection with NELPCO's BES shall be registered with, or in the process of registering with NERC at <http://www.nerc.com/>. After initial contact, NELPCO shall provide interconnection related information, including any applicable interconnection standards or design criteria. An applicant desiring interconnection shall then submit a formal request to NELPCO.
- 3.1.2. After receiving the request, a System Impact Study shall assess the capability of and the reliability impact to the transmission system to support the requested interconnection. The study will comply with the requirements of NERC, SERC and MISO. Upon completion of the System Impact Study, any additional studies such as a Facilities Study or EMTP study, will be determined to be necessary and when they will need to be completed. The applicant shall be responsible for all study costs. Assumptions used in the performance of the studies shall be coordinated with the applicant and any potentially affected systems and determined on a case-by-case basis and documented within the studies.
- 3.1.3. NELPCO or NELPCO's designee, shall confirm that the applicant's new or materially modified existing interconnections are within a Balancing Authority Area's metered boundary. NELPCO will confirm with the MISO BA that the Interconnecting Customer has made the appropriate provisions with them to operate within their metered boundaries.
- 3.1.4. When the proposed interconnection is found to be in conformance with

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NELPCO's requirements, NELPCO or NELPCO's designee, and the applicant shall negotiate an Interconnection Agreement for the design, construction, ownership, operation and maintenance of the interconnection.

3.2. Generator Interconnections (FAC-001-4, R1.1)

- 3.2.1 Generator additions are controlled in detail by FERC Order 2003-A, -B,-C (Order 2003) and any successor revisions of the Order. Order 2003 contains two sections that are referred to as the LGIP, Large Generator Interconnection Process, and the LGIA, Large Generator Interconnection Agreement. MISO has incorporated the LGIP and LGIA into its Open Access Transmission Tariff (OATT) as Attachment X. See MISO's OASIS site, <http://www.oatiaoasis.com/MISO/index.html>
- 3.2.2 The Process of interconnection of generation to the NELPCO transmission system is administered by MISO; however, the responsibility to perform specific tasks will be shared. Entities performing specific tasks will be included in the interconnection process. See Attachment X of the MISO OATT.
- 3.2.3 The following products will typically be developed during the Generator Interconnection, but these may be enhanced by the Planning Coordinator and/or Transmission Planner:
- A Base Case model used in the analyses, which includes transfer capabilities of the system based on committed transmission service agreements as well as pending requests for transmission service and interconnection.
 - A Feasibility Study, which is a preliminary evaluation of the system impact and cost of interconnecting the generation facility to the transmission system and includes a fault duty study and load flow study.
 - A System Impact Study which is an engineering study that evaluates the impact of the proposed interconnection on the transmission system and includes a fault duty analysis, stability analysis and a load flow analysis.
 - A Facilities Study may be conducted (if the interconnection request proceeds this far) which determines a list of facilities, the cost of those facilities and the time required to interconnect the generator to the transmission system.

3.3. Transmission Connections/Modifications (FAC-001-4, R1.2)

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- 3.3.1 Parties planning transmission additions that affect the NELPCO Transmission system, whether or not they are directly connected to NELPCO Transmission, are obligated to include NELPCO in its planning process.
- 3.3.2 All new and/or modified transmission facilities shall comply with all applicable codes, standards, and government regulations, environmental regulations, siting requirements, contracts, and operating agreements. These include, but are not limited to, all NERC Reliability Standards that are applicable to the particular Functional Entity, as defined by NERC.

3.4. End-User Connections/Modifications (FAC-001-4, R1.3)

- 3.4.1 NELPCO requires all End-User Connections to be at least 1 Mega-watt (MW) or aggregate multiple resources to 1 MW. If resources are aggregated together, these resources must have a single point of interconnection.
- 3.4.2 As applicable, these requirements shall apply to all new and end-use facilities connected to the NELPCO transmission system. Additionally, these requirements shall apply to all modifications of existing facilities or any change in the customer operations or facilities that result in a change in NELPCO's obligation to serve.
- 3.4.3 All new and/or modified end-use facilities shall comply with all applicable codes, standards, and government regulations, environmental regulations, siting requirements, contracts, and operating agreements. These include, but are not limited to, all NERC Reliability Standards that are applicable to the particular Functional Entity, as defined by NERC.

3.5. Information to Be Included with Facility Interconnection Request

- 3.5.1 The requestor shall provide the following detailed information for use in the transmission planning studies:
 - 3.5.1.1 Facility one-line diagram depicting detailed proposed facility connection points, voltage levels, equipment data, breaker/switch configurations, and protective relay zones.
 - 3.5.1.2 MW/MVAR capacity and/or demand at the point of connection including any special operational considerations or constraints.
 - 3.5.1.3 Transformer impedance data, winding configurations, voltage levels, thermal ratings, and available tap ranges.
 - 3.5.1.4 Generator nameplate data and machine constants, generator voltage rating, step-up, and auxiliary transformer data, impedance data, and ratings.
 - 3.5.1.5 Generator rotor, governor, exciter, power system stabilizer and

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any other generator auxiliary data in accordance with WECC generator data specifications.

3.5.1.6 Generator MW/MVAR levels, reactive capability curves, operational power factors and proposed load factors.

Design factors that should be addressed include:

- Load following capability
- Automatic Generation Control (AGC)
- Reactive power output
- Minimum operating capability
- Remote control functions
- Coordination of generation control system settings
- Load shedding
- Blackstart capability
- Dynamic stability and the use of power system stabilizers—SERC recommends that power system stabilizers be utilized for certain conditions identified in the stand-alone document, SERC Power System Stabilizer Guideline.
- Internal plant systems design (e.g., transformer rating/taps/impedance, cooling systems, generator/exciter rating) should be designed to support continuous reactive capability requirements at the point of transmission interconnection.
- Transmission interconnected equipment should have the tap ranges and self-regulation necessary to accommodate the transmission system's reactive power flow requirements.
- Load power factor
- Generator power factor
- Load equivalent sources of reactive power, if acceptable
- Generator equivalent sources of reactive power, if acceptable
- Transmission interconnections' impact on adjacent areas' voltage and reactive power flow requirements
- Operational requirements that should be addressed include:
 - Operation at 60 Hz nominal
 - Mode of frequency control
 - Operation of generators during frequency decline conditions

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- Coordination between generator controls and underfrequency load shedding programs
- Speed droop setting
- Responsibility for coordination with the appropriate operating entity
- Verification of reactive support capability per NERC Reliability Standards and corresponding SERC documents
- Generator step-up transformer (GSU) tap changes as necessary to meet voltage schedule and reactive support requirements

3.5.1.7 Transmission line configuration, impedance, voltage and thermal ratings.

3.6. Tap Configurations

3.6.1. NELPCO requests the connecting party provide a one-line diagram of the interconnection taps (Point of Interconnection, POI) with illustrated breaker arrangement.

3.7. Breaker Duty and Surge Protection

3.7.1. With respect to the connection of Generation, Transmission, or End-user facilities, NELPCO shall review breaker duty and surge protection to identify any additions required to maintain an acceptable level of NELPCO's system availability, reliability, equipment insulation margins, and safety. Design requirements that should be addressed include:

- Short circuit capabilities of current-carrying elements
- Voltage and steady state loading capacity ratings of interrupting devices
- Existing and planned future fault current levels
- Responsibility for required changes in existing Facilities due to increased fault currents (generator and Transmission projects only)
- Arrester applications

3.8 System Protection and Coordination

3.8.1. NELPCO's system protection requirements shall be designed to ensure the safety of the general public and all utility personnel, to protect the NELPCO system from equipment damage, to promote reliable system operation and to comply with applicable NERC and SERC Regional Reliability Standard Requirements.

NELPCO will not assume responsibility for protection of the requestor's

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interconnected facilities. The requestor is solely responsible for the installation of protection systems so that faults, imbalances or other disturbances on the NELPCO system do not cause damage to its facilities.

Design and Operational requirements that should be addressed include:

- Safety of the general public.
- Prevention/minimization of equipment damage.
- Minimization of equipment outage time.
- Minimization of system outage area.
- Minimization of system voltage disturbances.
- Maintenance of protective system coverage for abnormal conditions.
- Performance of all appropriate studies: grounding, short circuit, stability, power quality, and coordination of protective devices.
- Specification of Remote Terminal Unit (RTU) protocols and other communication channels.
- 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.
- Relay and device coordination with existing system protection.

3.8.2. Generation-specific Facility requirements that should be addressed include:

- Synchronizing with the transmission system
- Parallel operation with the transmission system
- Protection against islanding

3.9. Metering and Telecommunications

3.9.1. All current transformers, voltage transformers and metering equipment must meet any NELPCO, its Balancing Authority, its Transmission Operator and its Planning Authority specifications and accuracy standards. The requesting entity shall be responsible for telecommunications facilities sufficient to meet any remote meter reading and EMS/SCADA requirements as required by NELPCO, its Balancing Authority, its Transmission Operator and its Planning Authority. Metering data requirements that should be addressed include the following:

- kW
- kWh
- kvar, leading and lagging
- kvar-hour
- kV²-hour
- voltage
- Design requirements that should be addressed include:
 - Loss compensation
 - Bi-directionality

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- Metering accuracy
- Ancillary equipment specifications (e.g., current transformer (CTs), potential transformers (PTs))
- 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) typical data requirements could include the following:
 - Status of interrupting devices
 - MW flow
 - Mvar flow
 - Voltage
 - 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)

3.10. Grounding and Safety Issues

3.10.1. All interconnection equipment shall be operated and maintained in accordance with manufacturer's recommendations, prudent utility practices, and applicable environmental and safety standards. The interconnection substation shall have a ground grid that solidly grounds all metallic structures and other non-energized metallic equipment. This grid shall limit the ground potential gradients to such voltage and current levels that shall not endanger the safety of people or damage equipment located in, or immediately adjacent to, the station under normal and fault conditions. Generation integration may increase fault current levels at nearby substations and require modifications to existing stations. Design requirements that should be addressed include:

- Grounding study
- Compatibility with NELPCO's system
- Construction techniques and inspection requirements (if any) of NELPCO
- Testing
- Periodic maintenance
- Personnel safety considerations
- Interconnection of grounding system to NELPCO's grounding system(s)
- Transmission line shielding provisions
- Cathodic protection

3.11. Insulation and Insulation Coordination

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3.11.1. The customer shall ensure that all equipment is adequately protected from excessive system overvoltages. The Facilities Study shall determine when a transmission line switching study (transient analysis) is required. Such a study may be necessary to evaluate transient overvoltages caused by switching operations and to achieve proper insulation coordination. The study shall determine equipment Basic Insulation Level (BIL) requirements, surge arrestor requirements and/or breaker closing resistor requirements for the proposed facilities.

3.12. Voltage, Reactive Power, and Power Factor Control

3.12.1. The power factor for both Generation and End-user facilities shall be measured at the point of interconnection.

Generation facilities shall produce or absorb reactive power between 0.95 leading and lagging power factors, both steady state and dynamically, to meet voltage schedules on the bus to which they are connected. Such operations may require automatic voltage control in accordance with NERC standard VAR-002-4.1. They shall also have no consequential impact on the ability of the bulk electric system to meet any transient stability performance criteria. The System Impact Study shall assess the ability of the generator to meet these requirements. Further integration studies may be necessary to determine the generator facility reactive power capabilities necessary to ensure that the steady state and dynamic requirements are met.

All End-user facilities connected directly to the NELPCO system shall maintain a power factor between 0.95 lag and 0.95 lead as measured at the point where the End-user load interconnects with NELPCO facilities. If this power factor requirement is not met, NELPCO may install power factor correction equipment at the End-user's expense.

Design requirements that should be addressed include:

- Internal plant electrical system design (e.g., transformers, tap settings, motors and other loads, generator/exciter, voltage regulator) should not restrict any mode of project operation within the transmission system's allowable voltage range and regulation.
- Transmission interconnected equipment should have the tap ranges and self-regulation necessary to operate within the transmission system's voltage range and regulation.
- Voltage regulator load compensation, if required, to control voltage at a point beyond the generator terminals
- Voltage regulator droop compensation, if required, for generators whose terminals are directly connected (i.e., cross-compound, hydro)
- A/C power needs and sources of the Generator Owner facilities. These

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should not be presumed to be provided by NELPCO.

- Generator Owner battery and control enclosure requirements. These will not be shared facilities provided by NELPCO.
- Load and/or generation operation within the acceptable voltage range and regulation as specified by NELPCO
- Excitation system/voltage regulator allowable operating modes (e.g., automatic/manual)
- Generator voltage schedules
- Coordination of any reactive compensation devices

3.13. Power Quality Impacts

3.13.1. Power quality requirements are applicable to all generation facilities, transmission facilities and end-user facilities connected to NELPCO system. Generation of harmonics should be limited to values prescribed by IEEE Standard 519 when measured at the Point of Interconnection (“POI”). Power quality studies to define acceptable operating ranges and limits. Studies may include, but not be limited to:

- Voltage Unbalance
- Voltage Flicker
- Voltage Fluctuation
- Harmonic Distortion
- Transient Overvoltage
- Temporary Overvoltage
- Temporary Undervoltage
- Insulation Coordination
- Operating Frequency
- Power Factor Range
- Interruption/Outage Frequency
- Studies may identify additional equipment necessary to meet power quality standards.
- Operational requirements that should be addressed include:
- Connection of a generator, transmission Facility, or end-user load to NELPCO’s system should not unacceptably compromise or degrade the power quality of existing customers.
- Installation of power quality monitoring equipment at the expense of the interconnecting party to verify Facility owner/operator compliance with power quality performance requirements

3.14. Equipment Ratings

3.14.1. With respect to the connection of Generation, Transmission, or End-user facilities, the requesting entity is responsible for ensuring that its facilities do not result in any violation of NELPCO equipment ratings. Costs associated with adhering to equipment ratings with respect to the new or modified facility shall be the responsibility of the requesting entity.

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Equipment ratings shall be established and communicated in accordance with the current approved version of NERC Reliability Standards FAC-008 or its successor. Additional considerations may include:

- Identification of incorporation of NELPCO general design parameters and practices input into equipment ratings.
- Provision for NELPCO review of Facility design and specifications as they impact the reliability and operation of the transmission system.
- Special requirements due to atmospheric, geological, seismic, or environmental conditions
- Responsibility for changes to existing transmission system made necessary by the project.

3.15. Synchronizing of Facilities

3.15.1. Sync-check relays shall be required on all circuit breakers interconnecting transmission facilities to the NELPCO transmission system and shall be utilized to supervise the closing of those breakers. Manual closing of circuit breakers shall require verification of synchronism before closing. Automatic synchronization of generation shall also be supervised by a synchronizing check relay to assure that no connection to the transmission system is made without synchronization. All generation interconnections must meet all applicable ANSI and IEEE standards and be capable of operating within the full range of voltage and frequency excursions that may exist on the transmission system. Design and Operational requirements that should be addressed include:

- Responsibilities associated with synchronizing generation and transmission Facilities to the power system
- Required communications necessary between NELPCO and the generation/transmission Facility operator
- Synchronizing equipment
- Test plans
- Applicable reclosing requirements and prohibitions for generation and transmission Facilities

3.16. Maintenance Coordination

3.16.1. The owner of installed equipment shall be responsible for its proper operation and maintenance. Equipment shall be operated and maintained in accordance with manufacturer's recommendations, prudent utility practices, and applicable environmental and safety standards. The facility owner shall coordinate maintenance with NELPCO.

NELPCO will be notified and have the option to witness settings and testing of relays, meters, and controls that could affect the integrity and security of the interconnected transmission system. Maintenance of facilities associated with system protection shall be consistent with NERC

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Reliability Standard PRC-005-6 or its successor.

3.17. Operational Issues (abnormal frequency and voltages)

3.17.1. The facility connection studies shall identify impacts, deficiencies, operational issues (including abnormal frequency and voltages) and evaluate potential solutions. A proposed facility connection shall not degrade the reliability or operating flexibility of the existing power system. The proposed facility connection shall comply with all NERC, SERC, and MISO standards.

3.18. Inspection Requirements for Existing or New Facilities

3.18.1. Protective relays and control systems shall be inspected and tested by functional trip checking prior to putting any interconnected facility in service. NELPCO's personnel shall be involved with procedures prior to and during any maintenance and testing of protective relaying devices. The requesting entity shall be responsible for the costs associated with the ongoing testing and maintenance of the protective relaying and control equipment.

NELPCO personnel shall conduct an inspection of all new substation interconnection facilities prior to energization. The inspection requirements shall be consistent with the inspection requirements of NELPCO's existing substation facilities. Only after a satisfactory inspection is completed shall the new substation interconnection facilities be authorized for energization and synchronization.

3.19. Communications and Procedures for Normal and Emergency Operating Conditions

3.19.1. All communications and operating procedures during normal and emergency operating conditions (abnormal frequency and voltages for example) shall include NELPCO personnel. Any requests from the interconnected facility for any special operating considerations shall include NELPCO, for review and approval prior to execution. Emergency operating conditions shall be handled in accordance with NERC and WECC standards and good utility practice. The interconnection facility must recognize the dynamic nature of an interconnected transmission system and the reliability and safety priorities of NELPCO. NELPCO shall be informed of any switching operation being conducted on the interconnected facilities prior to switching occurring.

3.20. Motor Loads

Facility Interconnection Requirements and Study Procedures

The following data is required for each motor. Use specific nameplate data if available, otherwise use typical data.

- Horsepower
- Motor Code
- Motor Voltage
- Synchronous or Induction
- Full Load Amps
- Locked Rotor Amps
- Service Factor
- Starter Taps
- Percentage of Rated Horsepower Motor Will Be Loaded To
- Frequency of Motor Starting (eg. Compressor, Fan, Pump, etc.)
- Percentage of Time Motor will Run (eg. 25%, 50%, 75%, etc.)
- Function of Motor (eg. Full Voltage, Autotransformer, Electronic Soft Starter, Variable Frequency Drive, etc.)

3.21. Non-Motor Loads

The following data is required for non-motor loads. Non-motor loads may be combined into a composite load.

- Load KVA or Amps
- Rated Voltage
- Power Factor
- Load Factor
- General Description of Load (e.g. Lighting, HVAC, Welders, etc.)

3.22. Combined Entire Facility Load

The following data is required for each motor. Use specific nameplate data if available, otherwise use typical data.

- Load KVA or Amps
- Rated Voltage
- Power Factor
- Load Factor
- General Description of Load (e.g. Lighting, HVAC, Welders, etc.)

3.23. Other Major Electrical Equipment

The following data is required for each component. Use specific nameplate data if available, otherwise use typical data.

- Transformers - KVA rating, voltage, connection, impedance:
- Capacitors
- Bus/Conductor Size

Facility Interconnection Requirements and Study Procedures

- Breaker duty and surge protection
- Equipment Ratings
- Maintenance Coordination

3.24. Other Operating Characteristics

Provide the following data for your proposed facility.

- Estimated in-service date and timeline for operations:
- Interruptible Load (Yes or No)
- Interruptible Notice Requirements

4.0 **ENGINEERING/DRAWING REQUIREMENTS**

All engineering costs and engineering review costs shall be the responsibility of the requesting party. Modifications to NELPCO's transmission system to accommodate the proposed interconnection shall adhere to NELPCO specified design criteria. Any variation from the NELPCO specified design criteria may be considered on a case-by-case basis. Drawings for facility additions shall be approved by NELPCO. "As-built" drawings shall be provided prior to final approval by NELPCO. Drawings shall include, but not be limited to, station plot plans, equipment layouts, single-line diagrams, control circuit schematics, and wiring diagrams. Updated copies of these drawings shall be furnished to NELPCO within 60 days of any modification to non-NELPCO owned equipment or substations on NELPCO's system.

Breakers and switches installed in NELPCO's substations shall adhere to NELPCO's numbering schemes. All switches to be operated by NELPCO shall be locked with locks furnished by NELPCO and shall conform to NELPCO specifications.