

United State Army Corps of Engineers
Tulsa District
GENERAL REQUIREMENTS FOR
INTERCONNECTION

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1.0 INTRODUCTION

1.1 United States Corps of Engineers, Tulsa District Hydropower Overview

The United States Army Corps of Engineers Tulsa District (COE) has eight hydroelectric power plants containing 22 main generating units with a total capacity of 603,600 kilowatts. The Fort Gibson Power Plant, located on the Grand Neosho River about 5 miles north of Fort Gibson, Oklahoma, contains 4-12.5 Megawatt Generators turned by Francis Turbines. The Eufaula Power Plant, located on the Canadian River about 12 miles east of Eufaula, Oklahoma, contains 3-30 Megawatt Generators turned by Francis Turbines. The Keystone Power Plant, located on the Arkansas River about 15 miles west of Tulsa, Oklahoma, contains 2-35 Megawatt Generators turned by fixed blade propeller type turbines. The Tenkiller Power Plant, located on the Illinois River about 7 miles northeast of Gore and 22 miles southeast of Muskogee, Oklahoma, contains 2-20 Megawatt Generators turned by Francis turbines. The Robert S. Kerr Power Plant, located on the Arkansas River about 8 miles south of Sallisaw, Oklahoma, contains 4-27.5 Megawatt Generators turned by Kaplan turbines. Webbers Falls Power Plant, located about 5 miles northwest of Webbers Falls in Muskogee County, Oklahoma, contains 3-20 Megawatt Generators turned by Kaplan turbines. The units in this run of the river plant are at a 12 degree slant axis. The Webbers Falls Power Plant is currently undergoing a major rehab. The Denison Power Plant, located on the Red River 5 miles northwest of Denison, TX, contains 2-41.8 Megawatt Generators turned by Francis turbines. The generators at Denison were rewound in 2005. A major rehabilitation of the main generators was started in FY2013. The Broken Bow Power Plant, located on the Mountain Fork River approximately 9 miles northnortheast of Broken Bow, Oklahoma, contains 2-50 Megawatt Generators turned by Francis Turbines. Six of the eight plants are currently remotely operated from two master plants, with work underway to transition to one master plant controlling the other seven plants.

Power generated by the District projects is marketed by the Southwester Power Administration (SWPA). SWPA markets and transmits power to about 100 customers in a six state region via their transmission system and also markets power which is transmitted on other transmission structures own by other BES entities. Power is marketed to preference customers, 23 REA Co-Ops and 78 Municipal Power Companies in a seven state area.

Power is priced by law to recover the costs of generation and transmission (i.e. Government makes no profit). These include the amortization of the cost of power facilities and a portion of the dams, Corps O&M costs and similar costs for SWPA. The Corps does not receive any direct funds from customers.

USACE-SWT will make every effort to meet the electric reliability standards approved by FERC. However, as a federal agency we must comply with the limits imposed by other federal laws, orders and regulations, including limitations on the expenditure of federal funds. If any such limits or other unforeseen events (such as natural disasters) prevent our compliance with FERC approved compliance standards, we will promptly discuss the matter with SPP. Please note that we continue to provide information on a voluntary basis and our response does not constitute registration by USACE-SWT or an admission that we must comply with the reliability standards.

1.2 Purpose

This *General Requirements for Interconnection* document sets forth minimum requirements for interconnection by Interconnection Entities to the Corps of Engineers switchyards and associated power plant. In general all new transmission connections to our power plant switchyards must be approved by SWPA prior to requesting a connection to our facilities. All interconnections will be subject to Tulsa District and Southwest Division approval. Interconnection information shall include points of contact and references and an overview of requirements for funding, reliability, safety and security, environmental, land acquisition, technical, and contractual issues. There may be additional requirements by SWPA or the Southwest Power Pool (SPP) depending upon the location and scope of the proposed interconnection. The steps outlined in SWPA's *General Requirements for Interconnection* document shall be furnished to the Corps of Engineers prior to making any connection request. Connection requirements may be modified when the Government deems appropriate. The COE, SWPA's, and SPP interconnection process is separate, but are integral with each other.

2.0 INTERCONNECTION PROCESS

The Corps will evaluate each request for interconnection on a case-by-case basis. The evaluation will consider the reasonable needs of the requesting party and the Corps of Engineers and SWPA's need to operate and maintain its transmission system in a safe and reliable manner while adhering to its Federal statutory obligations.

Direct interconnection to the Corps of Engineers facilities neither includes nor guarantees rights to generation capacity on any electric utility system, including the system of SWPA. All new requests for transmission service must be submitted to SWPA and SPP for study and approval. Reference SWPA interconnection requirements at: <http://www.swpa.gov/interconnections.aspx>

There are multiple steps in the interconnection process. The steps outlined in this document may be modified by the COE on a case-by-case basis depending upon the specific circumstances of the requested interconnection.

Step 1: Submit Interconnection Application

1.1 Corps of Engineers Interconnection Application

For all interconnection requests involving transmission line tap(s), substation breaker bay additions, or new power delivery point(s), the requesting parties should contact the Corps of Engineers, Tulsa District, Chief of Operations Division and submit a formal Request for Interconnection (Attn: Tulsa District, US Army Corps of Engineers, Chief of Operations Division, 1645 S 101st E Ave, Tulsa, OK 74128). When submitting a Request for Interconnection to the Corps of Engineers, the requesting party should provide as much of the following information as possible to help expedite the design or review process including:

- 1) One-line diagram(s) showing the proposed interconnection, including any relaying and metering facilities.
- 2) Drawing(s) indicating the physical arrangements of existing and proposed facilities.
- 3) Geographic location of the proposed interconnection, including land ownership pattern, if available (if the interconnection is a tap, indicate the adjacent structure numbers).
- 4) Description of the proposed routing, approximate lengths and conductor size of transmission line additions or modifications, and dimensions and configurations of new structures.
- 5) Description and ratings of any proposed breakers, switches, metering, associated communications, relaying and other related equipment.
- 6) Description of transformer voltage and rating, winding connections, impedance if available, and proposed method of protection.
- 7) Proposed transmission path(s) and service arrangements between resources and associated loads, where applicable.
- 8) Description of generating resources or loads including current, voltage, MW and MVAR limits/ratings.
- 9) Proposed construction schedule.
- 10) Appropriate revenue and telemetering equipment specifications. The data should include load control boundary metering, current and potential transformer ratios and register and contact initiator ratios with multipliers.
- 11) Copies of relevant planning or operational studies.
- 12) Copies of relevant environmental impact assessments, reports, projections, or description of anticipated scope of environmental review.

The Corps of Engineers will start the process of a Request for Interconnection within 45 calendar days. If the Corps of Engineers denies the Request for Interconnection, an explanation will be provided, and will make every reasonable effort to support the requesting party in revising the request, as applicable. Interconnections to Corps of Engineers facilities may require congressional approval if not already mandated by Law

1.2 Application to SPP for Generation Interconnection

All Corps of Engineers power is marketed by SWPA and request for obtaining contracts for power produced by Corps of engineers generation facilities shall be obtained from SWPA.

1.3 Application to SPP for Transmission Service

For interconnection requests involving new transmission service, requesting parties should submit the appropriate transmission service request to SWPA and SPP in accordance with applicable provisions of the COE/SWPA Agreement and SPP's Open Access Same-time Information System (OASIS). SPP will determine if the transmission service request is valid and/or complete and coordinate all transmission service studies. It is the responsibility of the requesting party to establish requisite contracts with SPP for all transmission service studies. Once approval is obtained by SWPA and SPP, then the Corps will review the request and provide specific interconnection requirements.

Step 2: Scoping Meeting

For new connections at Corps of Engineers facilities a scoping meeting shall be held between the Corps of Engineers, SWPA, and requesting entity to discuss proposed and alternate connection options and general requirements, answer questions, exchange data, including results from applicable previously performed interconnection studies, and assemble a coordinated schedule for completion of the interconnection process.

Step 3: Execute Initial Agreements

3.1 Corps of Engineers Facilities Study & Environmental Documentation Agreement

For all interconnection requests, the requesting party will be required to execute a Facilities Study & Environmental Documentation Agreement with COE to 1) develop or review the design of the interconnection, 2) ensure that the interconnection satisfies the COE's and SWPA's technical and property requirements, and 3) complete all required environmental review and documentation. During the review or development of the interconnection design, the COE and SWPA may perform load flow analyses, short circuit analyses, and stability analyses to identify impacts to both SWPA's system and to neighboring utilities associated with the interconnection. The requesting party is required to advance funds to compensate the COE for all work performed under the Facilities Study & Environmental Documentation Agreement.

If the requested interconnection will potentially affect other parties, those parties will be identified and contacted by the COE prior to COE performing services under the Facilities Study & Environmental Documentation Agreement. Affected parties will jointly evaluate the proposed interconnection and other alternative plans, if appropriate.

The deliverables from COE to the requesting party under the Facilities Study & Environmental Documentation Agreement will include:

- 1) A detailed design of the interconnection facilities at the site including a table of major equipment which delineates operation, ownership, and maintenance responsibilities of the parties;
- 2) Environmental review of the interconnection and estimated costs for further environmental review, if applicable. The COE may determine that either an environmental assessment (EA) or Environmental Impact Statement (EIS) is required, in which case additional funding and/or agreements may be required; and

- 3) The estimated cost and time requirements to proceed with the construction/inspection phase of the proposed interconnection. Associated regional upgrades for interconnection of new generation facilities and transmission service are not included in this agreement but are addressed by SWPA and SPP.

The COE will use due diligence to provide the results of COE's work under the Facilities Study & Environmental Documentation Agreement related to equipment at the point of interconnection within 180 days of executing the agreement.

The requesting party may perform or, upon approval of the COE, contract with third-parties to perform certain studies associated with interconnections; however, the requesting party, or designated representative of the requesting party, may be required to present an evaluation of the proposed interconnection to the COE, SWPA, and/or the SPP.

Step 4: Execute COE Standard Interconnection Agreement or Construction Agreement

Upon the COE's completion of its work under the Facilities Study & Environmental Documentation Agreement, the requesting party must advise the COE of its desire to proceed. The COE will prepare a Construction Agreement to be executed between the COE, SWPA, and the requesting party

The Construction Agreement will include the scope, cost, and cost allocation of interconnection facilities determined pursuant to work performed under the Facilities Study & Environmental Documentation Agreement and outline specific requirements for the proposed interconnection. In addition, the Standard Generator Interconnection Agreement will include additional operational and contractual obligations of the requesting parties associated with interconnection of a generation facility.

The requesting party has 60 days from the date the COE tenders the final Construction Agreement to sign and return the applicable Agreement to the COE and provide advanced payment. COE will proceed with the work under the Agreement once advanced funds are in place.

Step 5: Land Acquisition

Upon completion of the environmental process and if land rights are to be owned by the COE negotiations for leases and easement begin. If it is determined that easements or leases are required then the COE will conduct investigations for such action. The requesting parties are required to provide funds to the COE in advance of such real estate activities.

Step 6: Review, Testing, and Energization

Once construction has been completed, and before energizing the new connection, the COE will coordinate with the requesting party for review and testing of the new facilities. The COE will use prudent utility practice in review and testing. All work and obligations set forth in Construction Agreement, including, but not limited to, real estate activities, joint-use permits/easements, COE receipt of the appropriate as-built drawings, operating instructions, and other relevant materials shall be accomplished or provided before energizing.

3.0 GENERAL REQUIREMENTS

3.1 Funding Requirements

Unless otherwise agreed in the Standard Construction Agreement, all of the COE's costs associated with facilitating the connection request are the responsibility of the requesting party. Advanced funds are required before the COE performs any studies, design, real estate activities, or construction. The contractual agreements will specify the amount of funds required to be advanced. Upon receipt by COE, advanced funds will be placed in a cost account for the project. Upon request or as set forth in the applicable agreement, cost statements will be furnished as work performed by the COE progresses. Furthermore, if additional funds are required to complete the interconnection, the COE will invoice the requesting party and will only complete the work for which it has received advanced funds, in accordance with the applicable agreement. In addition, as specified in the applicable agreement, the agreement may be terminated if additional funding is not received.

3.1.1 Funding for COE Facilities Study and Environmental Documentation

The agreement executed between the COE and the requesting party will clearly specify the COE's estimate of the cost of COE's services. The charges the requesting party is assessed will not exceed the actual cost of performing such services. Requesting parties will not be assessed a charge for work product from previously performed review or analyses when such analyses are applicable to the requesting party's interconnection request, but the requesting party will be responsible for charges associated with any modifications to existing reviews or analyses that are reasonably necessary to evaluate the requesting party's request.

Advanced payment to the COE by the requesting party is required for the COE to perform the necessary environmental review. Estimated costs are based on historical expenses for similar interconnections and are specifically determined on a case-by-case basis by the COE. Advanced funds for all environmental review work may be secured contractually through the Facilities Study & Environmental Documentation Agreement.

Once the agreement is executed between the COE, SWPA, and the requesting party, the requesting party will advance funds to the COE for performing the studies. The COE reserves the right to halt work at any time should advanced funds not be received from the requesting party.

3.1.2 Funding for Land Acquisition

Advanced payment, pursuant to Administrative Fees IAW 10 USC 2695, to the COE by the requesting party is required for the COE to perform any real estate activities. Estimated costs are based on historical expenses for similar projects and are specifically determined on a case-by-case basis by the COE. Charges the requesting party is assessed will not exceed the actual costs associated with these activities. Advanced funds for real estate activities may be secured contractually through the Facilities Study & Environmental Documentation Agreement and Construction Agreement.

3.1.3 Funding for Construction

Based on the studies and environmental documentation and review performed by the COE under the Facilities Study & Environmental Documentation Agreement, the COE may begin construction. If the construction of new facilities would require the expenditure of COE funds, the COE reserves the right to halt design and/or construction at any time during its work until funds are received.

3.1.4 Funding for Equipment Replacement

Should replacement of existing equipment be required, the equipment will be removed and replaced at the sole expense of the requesting party; however, the COE, at its sole discretion and option, may: 1) Participate in the costs of the proposed project; and/or 2) allow ownership of replaced COE equipment to be transferred to the requesting party in exchange for transfer of ownership of the new equipment to COE.

3.1.5 Funding for Facilities Operations and Maintenance

The Construction Agreement, or other agreement will set forth funding required by the requesting party, if any, for long-term operations and maintenance associated with the interconnection.

3.1.6 Excess Payments

Any advanced payment made by the requesting party in excess of the actual costs incurred by the COE will be refunded, without interest.

3.2 Reliability Requirements

Interconnection to COE facilities must be consistent with the COE's mission and prudent utility practices. A proposed interconnection must not degrade the reliability or operating flexibility of the existing power system and must meet NERC's *Planning Standards and Operating Manual* procedures, the COE and the SPP Criteria.

The requesting party will be responsible for testing and reporting requirements in accordance with applicable NERC Planning Standards, SPP Criteria, or any similar standards of a successor organization to either NERC or SPP.

3.3 Safety and Security Requirements

When making an connection to COE facilities, the requesting party must comply with applicable security requirements, safety laws, building and construction codes, provisions of Federal regulations (including the Contract Work Hours and Safety Standards Act and regulations promulgated by the Secretary of Labor pursuant to the Act), and state or local safety, health, and industrial regulations and codes. Additionally, all requesting parties must comply with the requirements outlined in COE's *Safety Manual*. In the event that the requesting party does not adhere to construction and safety procedures, the COE may issue an order to stop work until such time that the requesting party demonstrates compliance with the provision at issue. The requesting party cannot make a claim for compensation or damage resulting from such work stoppage. Copies of the COE's construction and safety procedures will be provided upon request.

Each connection must be constructed in accordance with the COE's safety and security standards, COE technical standards, NFPA requirements, ANSI C2, and other applicable requirements. Safety related standard design features include, but are not limited to:

- 1) A ground grid that solidly grounds all metallic structures and other non-energized metallic equipment.
- 2) Modifications to ground grids of existing substations (if necessary) to keep grid voltage rise within safe levels.
- 3) Switch operating platforms for all disconnect switches, with ground conductors connected to the operating mechanisms. Switch operating platforms must be metal grates and must be installed in such a way that water will drain freely from the platform.
- 4) Disconnect switches (gang-operated) that are lockable in the open position by the COE.
- 5) Fall protection features permanently installed on equipment.
- 6) Area lighting per IES requirements

3.4 Environmental Requirements

The COE is required to assess the potential environmental impacts of any proposed interconnection in accordance with the National Environmental Policy Act (NEPA) of 1969, other environmental policies and laws, and applicable COE rules and regulations. Requesting parties are advised to consult with the COE as early as possible in the planning process to obtain guidance with respect to the appropriate level and scope of any studies or environmental information that the COE requires.

3.5 Contractual Requirements

All arrangements for technical work, environmental work, design, construction, facility ownership, real estate activities, operations, maintenance, and replacement of equipment must be set forth in written agreements between the COE, SWPA, and the requesting party prior to start of any work and at appropriate intervals thereafter. Such agreements establish provisions for estimated costs, advance of funds, work to be performed, project schedule, and other work related items.

All work related to an interconnection to the COE facilities is subject to the COE's applicable Contract Provisions. These provisions will be furnished upon request.

4.0 TECHNICAL REQUIREMENTS

4.1 System Planning

For interconnection requests associated with new generation facilities or transmission service, the requesting party must coordinate with COE and SWPA to evaluate impacts to Federal facilities at the point of connection and with SPP for the performance of studies to evaluate potential regional impacts

and limits to transfer capability on facilities beyond the immediate point of interconnection. It is the responsibility of the requesting party to contact SPP and establish requisite contracts for all studies performed by SPP. If either SPP or SWPA studies indicate that additions or upgrades to the existing facilities beyond the point of interconnection are necessary, the COE, SWPA and SPP will coordinate to determine the cost of additions or upgrades and the time frame for implementing such system additions or upgrades.

Studies conducted or required by the COE will typically include power flow, transfer capability analysis, and short circuit studies. It is the responsibility of the requesting party to provide any special modeling data. Power flow analysis will include long-term load and resource growth data and planned facilities needed to satisfy such requirements.

Should replacement of existing equipment be required because of the interconnection, the COE will retain equivalent capacity and operational control as previously existed, unless otherwise evidenced in one of the applicable agreements.

4.1.1 Power Quality

Unbalanced phase voltages and currents can affect protective relay coordination and cause high neutral currents and thermal overloading of transformers. To protect electrical equipment, the interconnected generator's or load's contribution at the point of interconnection must not cause a voltage phase unbalance greater than 1 percent or a current phase unbalance greater than 5 percent (phase unbalance is the percent deviation of one phase from the average of all three phases). Abnormal frequencies and voltages caused by interconnections shall be investigated by the transmission operator, Regional Transmission Operator and interconnection entity. The interconnection entity shall furnish any and all information necessary in order to investigate the cause of the event and make any corrective actions necessary to prevent future deviations.

Harmonics can cause telecommunication interference and thermal heating in transformers, disable solid state equipment, and create resonant over voltages. To protect equipment from damage, harmonics must be mitigated. The interconnected generator or load must not create voltage and current harmonics on the COE's facilities that exceed the limits specified in the Institute of Electrical and Electronics Engineers (IEEE) Standard 519, Recommended Practices and Requirements for Harmonic Control in Electric Power Systems (harmonic distortion is defined as the ratio of the root mean square value of the harmonic to the root mean square value of the fundamental voltage or current). Harmonic distortion measurements may be conducted at the point of interconnection, generation, or load site or other locations on the COE's facilities to determine whether the project is the source of excessive harmonics.

Many methods may be used to restrict harmonics. The preferred method is to install a transformer with at least one delta connection between the generator or load and COE facilities. This method significantly limits the amount of voltage and current harmonics entering the transmission system.

Voltage fluctuations associated with equipment or loads at the point of interconnection may be noticeable as visual lighting variations (flicker) and can damage or disrupt the operation of electronic

equipment. IEEE Standard 519 provides definitions and limits on acceptable levels of voltage fluctuation.

In no case shall interconnections result in increased power quality problems or negatively impact Government resources.

4.1.3 Load Interconnections

Typically, all loads connected directly to COE facilities are required to maintain a power factor between 0.95 lagging and 0.95 leading measured at the point where the load interconnects with COE equipment. If the specified power factor requirement shall be maintained per SWPA requirements.

SWPA maintains transmission voltages at levels required for reliable transmission of electricity. Regulation to keep voltage variations within limits acceptable to end-use customers is typically provided on distribution.

All new interconnections shall include components and connections necessary for synchronization to the COE facility.

COE and SWPA system protection requirements are designed and intended to protect COE and SWPA equipment.

Power circuit breakers, switches, busses, and other COE switchyard component ratings and duty cycles shall not be exceeded due to new interconnections.

Voltage and surge protection equipment ratings/limits shall not need to be exceeded due to new interconnections to COE facilities.

4.2 Design

The COE and SWPA will typically provide for design, specification, and construction of connections to COE facilities; however, design and construction by others may be allowed on a case-by-case basis. All design and construction by others is subject to review and approval by the COE. All work performed by the COE, including revisions to existing COE drawings and review of work by others, will be at the expense of the requesting party.

Modifications to COE facilities to accommodate the proposed interconnection must adhere to applicable COE Requirements, Regulations, and Specifications. Copies of these documents will be made available upon request.

Drawings for facility additions must conform to the COE *CAD Drafting Standards* and be approved by the COE. The requesting party must supply drawings in electronic format(s) compatible with the COE computer aided design systems. The requesting party must also reimburse the COE for drawing costs associated with creating or revising drawings. Drawings become or remain the property of the COE. Copies of the COE's Drafting Standards will be furnished to the requesting party if the design is not produced by the COE. "As-built" drawings must be provided prior to operation of the interconnection.

Three complete sets of accurate switchyard drawings must be provided to COE for COE owned substations. These drawings must include, but not be limited to, station plot plans, equipment layouts, one-line diagrams, control circuit schematics and wiring diagrams. Updated copies of these drawings must be furnished to the COE within 60 days of any modification to COE facilities.

Power circuit breakers, disconnecting switches, and other equipment installed in the COE facilities must adhere to SWPA's and the COE standard equipment identification schemes. Breaker and switch operating identifiers will be assigned by SWPA. All switches to be operated by SWPA will be locked with kirk key locks. All switches to be operated by COE must be designed in accordance with COE design requirements.

Line relays shall be provided to protect the switchyard components and transmission lines. The following protection features are existing at each facility: transformer differential, over current, bus differential, three zone phase distance tripping. SWPA provides settings for line relays and coordinates the setting for the transmission system. New interconnections shall provide new or replace existing components per standards depending on the Interconnection Entity's project.

4.2.1 Switchyards

Power circuit breakers, disconnect switches, buss work, surge protectors, controls, metering components, etc., must be installed for connections at switchyards. Typical specifications covering circuit breaker requirements are available from the COE and SWPA upon request.

Installation of equipment in substations must conform to the COE's requirements and must be approved by the COE. Oil-filled equipment, including bushings, must not contain polychlorinated biphenyls (PCB). In addition, oil-filled equipment must be permanently labeled by the manufacturer as non-PCB. Certification must be provided to the COE at or before the time of installation. Oil filled equipment shall require an oil spill containment system to comply with U.S. Environmental Protection Agency or state regulations. Any increased environmental costs associated with such compliance identified during or after construction will be borne by the requesting party.

All additions to the COE switchyard facilities shall have a ground grid that solidly grounds all metallic structures and other non-energized metallic equipment. This grid must limit the ground potential gradients to voltage and current levels that will not endanger the safety of people or damage equipment located in, or immediately adjacent to, the substation under normal and fault conditions. Ground resistance calculations and tests are required for any alterations to COE facilities.

All insulators shall be rated for the operating voltages in accordance with ANSI and IEEE standards.

4.2.2 Transmission Line Taps

Transmission line taps are not permitted except as specifically approved by SWPA.

4.2.3 System Protection

Protective relaying requirements for each interconnection will be determined by SWPA and the COE after receipt of a preliminary one-line drawing of the proposed interconnection and an one-line drawing and maps of the requesting party's facilities or system in the area. The requesting party should provide recloser and fuse ratings, relaying data and line and transformer impedances. SWPA's lines are normally protected with two high-speed piloted direction comparison blocking schemes, with ground overcurrent and step-distance backup. The relaying channel is usually through fiber optic ground wire or power line carrier.

4.3 Operations and Maintenance

Operation and maintenance authority of the circuit breakers, disconnects, interrupters and motor operated disconnect switches that are an integral part of COE facilities will remain with the COE. COE and/or SWPA operations staff will order switching and issue all clearances and hot-line orders on the transmission portion of the interconnection or substation. This will involve use of COE and/or SWPA's switching and clearance procedures, including the use of COE and/or SWPA locks and tags.

The owner of installed equipment will be responsible for its proper operation and maintenance unless otherwise approved by SWPA and the COE. Equipment must be operated and maintained in accordance with the manufacturer's recommendations, prudent utility practices, and applicable environmental and safety standards.

If construction is done by others, the COE and SWPA may require at least one COE and one SWPA representative is present to coordinate and provide for switching, clearances, special work permits and inspections during construction work on COE properties. The SWPA and COE representative will also conduct operability checkout on equipment, including metering, relay settings and tests, and protective device operation (circuit breakers, motor operated disconnects, etc.). Final electrical connections to COE facilities will be as directed by the COE. The COE reserves the right to inspect any Interconnection Entity's equipment on government property or within the government's easement. The interconnection entity shall open equipment for inspection within 24 hours of request by the COE.

The COE and SWPA must be notified and have the right to witness settings and testing of relays, meters, and controls that could affect the integrity and security of COE facilities. The COE must also have the right of unescorted entry to interconnected facilities for emergency operation and maintenance of equipment and/or structures.

4.3.1 System Control

Supervisory control by COE switchyard power circuit breakers, interrupters, or motor operated disconnects will be required on all interconnections where breaker, interrupter, or disconnect switch operations can, in the COE's opinion, directly affect the security of the COE facility or SWPA's transmission system. The RTU for SCADA control must be compatible with the SCADA system used by the COE and modified if necessary to accommodate the COE's replacements and upgrades. Installation of the RTU at a new location or modification of an RTU at an existing facility will generally be performed by the COE, at the expense of the requesting party. The COE will perform the necessary expansion, including hardware and software changes, to the SCADA master station equipment at the

requesting party's expense for that portion attributed to the new interconnection. Transducers, interface hardware, and appropriate communication channels compatible with existing SCADA system requirements must be furnished by the requesting party. Specifications for such equipment will be provided upon request. The requesting party must provide necessary auxiliary and control relays, hot-line indication, local-supervisory switches, hotline order lamp, and all other equipment necessary to interface with the COE's supervisory control equipment. In no case will an interconnection entity be allowed to connect to the COE's computer equipment or network.

4.3.2 Ownership and Maintenance

Ownership of installed facilities is determined on a case-by-case basis. However, the COE generally retains operation and SWPA maintains dispatching authority of those facilities considered to be integral to SWPA transmission system regardless of ownership.

The owner of equipment installed on COE facilities is financially responsible and liable for the proper maintenance of such equipment in accordance with manufacturer's recommendations and prudent utility practices. SWPA will operate and perform routine maintenance on facilities located in its switchyards unless otherwise agreed to by the COE and SWPA. The COE reserves the right to perform all maintenance on equipment installed on its property. Furthermore, ownership of all equipment or personal property placed on COE land or in COE facilities must be clearly marked on the equipment or property.

The COE reserves the right to maintain operational control of all facilities that interconnect with its facilities that may be vital to system stability and telemetry values.

The COE reserves the right to approve facility changes that affect operation of the COE's facilities

Requirements for operations, maintenance, ownership and replacement of equipment associated with an interconnection facility will be specified in a new or amended contract with the requesting party.

4.4 *Communications and Metering*

4.4.1 Communications

The requesting party must provide communications facilities sufficient to meet COE and SWPA, telephone, radio, system protection, remote meter reading, and SCADA requirements solely at the expense of the requesting party. Unless otherwise agreed to by the COE and the requesting party, the COE will design, furnish, install, and own all communications that are an integral part of COE facilities.

The communication equipment will be provided by the requesting party. The COE and SWPA will specify the type, speed, and characteristics of the communication equipment so that compatibility with existing communications, SCADA control, relaying, and telemetering equipment is maintained. The specific type of communication equipment to be furnished by the requesting party will be reviewed and approved by the COE and SWPA. The requesting party will reimburse the COE for the costs of any

additional facilities provided by the COE. The interconnection entity will not be allowed to connect its network communication system to the COE computer systems.

4.4.2 Metering

Metering shall be in accordance with SWPA requirements and furnished by the interconnection entity per requirements.

5.0 POINTS OF CONTACT

Tulsa District

US Army Corps of Engineers

Chief Operations Division

CESWT-OD

1645 S 101st East Avenue

Tulsa OK 74128

Revision	Effective Date	By	Summary of Changes
1.0	10/23/2015	Bobby Pidgeon	Initial Document