

Business Practice

Salt River Project Agricultural Improvement and Power District

Effective Date: September 26, 2008

Version 0

This document can be found at <http://www.oatioasis.com/SRP/index.html>

FACILITY CONNECTION REQUIREMENTS

Introduction: All interconnections to the Salt River Project Agricultural Improvement and Power District (SRP) electric system, including interconnections of SRP self-build facilities, must be in compliance with all applicable SRP Transmission Standards, Electric Service Standards, Planning Standards and Operating Policies of the North American Electric Reliability Council (NERC) or its successor, as administered by the Western Electricity Coordinating Council (WECC) or its successor.

The NERC Facility Connection Requirements, Standard FAC-001-0, state that:

“The Transmission Owner shall document, maintain, and publish facility connection requirements to ensure compliance with NERC Reliability Standards and applicable Regional Reliability Organization, sub-regional, Power Pool, and individual Transmission Owner planning criteria and facility connection requirements. The Transmission Owner’s facility connection requirements shall address connection requirements for generation, transmission, and end-user facilities.”

These Facility Connection Requirements (FCR) are developed and publically published in compliance with the above cited NERC requirement.

This FCR is subject to change. The current version of the SRP FRC will be that posted on the SRP Open Access Same-Time Information System (OASIS).

I. INTRODUCTION AND SUMMARY

These FCR address NERC, WECC and SRP requirements for interconnection of generation facilities, transmission facilities and end-user facilities (load). Specifically, the FCR identify technical requirements and other applicable regulatory requirements for connecting generation resources, transmission facilities and large loads to the SRP electric transmission system (which as used in this FCR generally refers to SRP electric transmission facilities at or above 69 kV).

Purpose. The primary purpose of these FCR is to ensure the safe operation, integrity and reliability of the SRP transmission system. These FCR do not specifically address contractual matters, including, without limitation, costs, ownership, scheduling, and billing. Also, no transmission service is provided, contemplated or addressed in these FCR. Transmission service from SRP may be requested through the SRP OASIS independently of any interconnection requests.

This FCR is a summary only of the SRP interconnection procedures. Parties

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should refer to SRP's OASIS, <http://www.oatioasis.com/srp/index.html>, or contact SRP Transmission Operations for more information on the interconnection process, business practices, contractual matters or transmission service.

Defined Terms. In these FCR, the terms SRP, Balancing Authority Area, SRP transmission system, and Company all refer only to SRP Transmission Operations and Planning Department and the SRP transmission system as comprised of electric transmission facilities generally at or above 69 kV. The term 'Interconnection Customer' refers to any entity requesting a new or modified interconnection to the SRP transmission system for a generation resource, transmission facility or load. The term "Project" refers to the underlying generating resource, transmission facility or a load that is the subject of a request to interconnect to the SRP transmission system.

Request for Interconnection. Requests are submitted by an Interconnection Customer. SRP evaluates and studies each request for each Project individually and determines impacts to the SRP transmission system. For generation interconnections, the Interconnection Customer must follow the Generation Interconnection Requirements for large or small generator interconnections, as applicable, that are included in SRP' Open Access Transmission Tariff (OATT). Specific interconnection requirements or conditions for an interconnection, including construction of new or upgraded transmission system facilities, will be identified through a detailed study process and the results provided to the Interconnection Customer. Generally, all costs caused by the request for, and then facilitation of, an interconnection of a Project are borne by the Interconnection Customer.

Interconnection Studies. Interconnection studies may include a preliminary plan of service for physical and communications interconnections. Physical laws that govern the behavior of electric systems do not recognize the boundaries of electric facility ownership. Therefore, the electric power systems must be studied without regard to ownership to develop a properly designed interconnection that can assure safe operation, integrity and reliability of the SRP transmission system. The final study may include analysis of short-circuit fault duties, transient voltages, reactive power requirements, stability requirements, harmonics, safety, operations, maintenance and prudent electric utility practices.

Other Applicable Standards. These FCR are not intended to be design specifications or an instruction manual, and the information presented may change periodically based on industry events, regulatory requirements, evolving standards and practices or for other reasons. The technical requirements stated herein are consistent with SRP' current internal practices for system additions and modifications. These requirements are generally consistent with principles and practices of the NERC, WECC, Institute of Electrical and Electronics Engineers (IEEE) and American National Standards Institute (ANSI). The standards of the above-listed organizations are also subject to change and when applicable, the most recent version of such standards shall apply to each interconnection request. Also, much of the information in these Facilities Connection Requirements is derived or summarized from the SRP Large Generator

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Interconnection Procedures (LGIP) as provided in SRP' OATT.

II. REQUESTING AN INTERCONNECTION OF NEW FACILITIES

Parties may request interconnection of a generation facility, transmission facility or load to the SRP transmission system. For any request, SRP should be contacted as early as possible in the planning process. An interconnection study must be performed to determine the required additions and modifications to SRP' substations, transmission lines, control and communications circuits to accommodate the proposed interconnection.

Modifications of existing interconnected facilities will be consistent with the procedures for large and small generation interconnection in the SRP OATT which are available on SRP's OASIS website.

Procedures for requests for SRP transmission service are detailed in the SRP OATT and are not included in this document.

A. Requesting an Interconnection

1. Generation Request

Requests for new generation interconnections will be consistent with the procedures for large and small generation interconnection in the SRP OATT. Where applicable for generation interconnection requests, the specific timeline, queuing, and submission requirements in the OATT will be followed. Requests for interconnection require significant information regarding the Project. Details on required information as well as more information about the generation interconnection process and required forms are available on the SRP OASIS.

2. Transmission Request

Requests for new transmission interconnections are initiated by completion of the request form available on the SRP OASIS. A scoping meeting will be held to fully discuss the request and aspects of the proposed interconnection. A study agreement will follow which will require if the Interconnection Customer elects to proceed with its request following the scoping meeting, the Interconnection Customer must enter into a study agreement with SRP and provide a deposit of 50% of the estimated cost of the study.

3. End-User (Load) Request

Information regarding SRP' electric service requirements for new End-User (load) connections of less than 69 kV service may be found on SRP' internet web site (www.SRPnet.com) under Design and Construction Project Guidelines. Information for connections at 69 kV or higher should be requested from

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srpt@srpnet.com.

B. Notification of Interconnection

The process of providing notification of an interconnection request is evaluated for each interconnection request. The process can be different for each type of request and the general requirements are detailed below.

1. Generator Interconnection

After an application for a generator interconnection has been submitted and a study agreement is signed, the general information regarding the project is posted on the generation interconnection queue on SRP' OASIS site.

2. Transmission Interconnection

After an interconnection request involving transmission facilities has been accepted by SRP, it shall be reported to the WECC and/or a Western Interconnection study groups such as Southwest Area Transmission (SWAT) or Western Arizona Transmission System (WATS) at the earliest regularly-scheduled opportunity by either the Interconnection Customer or SRP. The information provided may include, but is not limited to, giving a project summary at a SWAT meeting or inclusion of the project in the WECC Significant Additions report. If the Project is requesting interconnection to facilities that are jointly owned, but operated by SRP, notification of the request shall be sent to each owner.

3. End-User (Load) Interconnection

Notification for an end-user interconnection request will be as applicable for each individual request.

C. Coordination of Interconnection Studies

The transmission study process for the each requested interconnection must also consider and accommodate coordinated joint studies with other affected interconnected transmission system owners. Depending upon the type and scope of the interconnection request, a transmission study performed by either SRP or others may require review and endorsement by the appropriate SWAT subcommittee. Depending on the location of the proposed Project, such studies may require review by multiple subcommittees, as a part of a coordinated planning approach in the WECC.

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D. Interconnection Studies

The transmission planning process is an important first step in the determination of interconnection feasibility. The transmission planning studies will identify impacts, deficiencies, available capacity, operational problems or interconnection facility concerns and evaluate potential solutions. A proposed interconnection must not degrade the reliability or operating flexibility of the existing power system. The proposed interconnection must comply with all NERC and WECC Reliability and Planning Criteria.

SRP will conduct or review system impact studies required to evaluate the system impact of a proposed interconnection on the reliability and capability of the transmission system. These studies can require considerable time and effort, depending on the size of the Project and its potential system impacts. Any costs to conduct or review system impact studies are the responsibility of the Interconnection Customer.

III. GENERAL FACILITY CONNECTION REQUIREMENTS

SRP' FCR will address, but are not limited to, the following:

- 1 Coordination of joint studies of new facilities and their impacts on the interconnected transmission systems.
- 2 Notification of new or modified facilities to others (those responsible for the reliability of the interconnected transmission systems) as soon as feasible.
- 3 Voltage level and MW and MVAR capacity or demand at point of connection.
- 4 Breaker duty and surge protection.
- 5 System protection and coordination.
- 6 Metering and telecommunications.
- 7 Grounding and safety issues.
- 8 Insulation and insulation coordination.
- 9 Voltage, Reactive Power, and power factor control.
- 10 Power quality impacts.
- 11 Equipment Ratings.
- 12 Synchronizing of facilities.
- 13 Maintenance coordination.
- 14 Operational issues (abnormal frequency and voltages).
- 15 Inspection requirements for existing or new facilities.
- 16 Communications and procedures during normal and emergency operating conditions.

Each of the items listed above will be addressed in SRP' study(ies), as applicable to the specific interconnection request. Details of the study parameters are contained in procedures for large and small generation interconnection in the SRP OATT which is available on the SRP OASIS website. More general requirements are detailed below.

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A. Transmission and Substation Facilities

Interconnections to the SRP transmission system may require that one or more SRP transmission lines be looped through the Interconnection Customer's facilities or to

be sectionalized with the addition of switching equipment. The design and ratings of these facilities shall not restrict the capability of the lines and SRP contractual transmission path rights.

1. Transmission Line Designs

Transmission line designs, for transmission lines interconnecting into SRP facilities, shall meet the requirements of SRP transmission line design standards including, but not limited to, satisfaction of the requirements of OSHA.

2. Substation Facilities

Substation facilities that interconnect with SRP transmission facilities must meet SRP substation design and construction standards and must be designed to the applicable requirements of ANSI and IEEE Standards. Electrical equipment in the substation must be sized to carry the full current rating of the intercepted transmission path, and all interrupting devices, such as circuit breakers shall have interrupting capability sufficient to satisfactorily interrupt the maximum short circuit currents that may occur at the location of the interconnection including margin for circuit breaker duty and DC offset.

3. System Protection and Control Schemes

System protection and control schemes are coordinated to provide for safety and equipment protection and to minimize disruption of services during disturbances. Interconnections generally require the addition or modification of such protection and control schemes. The new protection must be compatible with the existing protective relay schemes and shall not degrade the dependability or security of existing protective relay schemes. The protection scheme will also ensure there are no problems with being out of synchronization when closing breakers. Interconnected generation facilities will be required to participate in the SRP and WECC under frequency and over frequency program. There are several acceptable settings in the program from which to choose. Interconnected End-Users are required to participate in the SRP and WECC under frequency program and the SRP automatic under voltage load shedding program.

B. Insulation Coordination

Power system equipment is designed to withstand voltage stresses associated with expected operation. Adding or connecting new facilities may change equipment duty, and

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may require that equipment be replaced or switchgear, telecommunications, shielding, grounding, or surge protection added to control voltage stress to acceptable levels. Voltage stresses, such as lightning or switching surges, and temporary over-voltages may affect equipment duty. Remedies will depend upon the equipment capability and the type

and magnitude of the stress. Interconnection Customer shall make available to SRP all drawings, specifications, test plans, application documents, and equipment settings.

C. Station Grounding

Each interconnecting station must have a ground grid that is solidly connected to all metallic structures and other non-energized metallic equipment. The grid shall limit the ground potential gradients to such voltage and current levels that will not endanger the safety of people or damage equipment which are in, or immediately adjacent to, the substation under normal and short circuit conditions. Ground grid size and type are dependent upon local soil conditions and available electrical fault current magnitudes, among other factors. In areas where ground grid voltage rises would not be within acceptable and safe limits, grounding rods and grounding wells may be required to reduce the ground grid resistance to acceptable levels. All grounding will follow the guidelines established in IEEE 80-2001 or the more recent guidelines found in the IEEE Guide in AC Substation Grounding. Design review and testing may be required to ensure these guidelines are met.

D. Transformers, Shunt Capacitors, Shunt Reactors, and other Voltage Control Devices

Transformer tap settings, voltage ratings and the set points, sizes of shunt-connected capacitor and/or reactor equipment as well as other voltage control devices shall be coordinated with SRP to optimize reactive flows and voltage profiles. Automatic controls may be necessary to maintain these profiles on the interconnected system.

E. Key Reliability and Availability Considerations

The new interconnection shall meet all applicable requirements of the WECC and NERC operating and planning standards. In addition, the following requirements apply to all Projects:

1. Tools and spare equipment must be readily available at the Interconnection Customer's disposal to accomplish foreseeable operations and maintenance tasks.
2. Standardized design, planning and operating practices and procedures should be used so that the new connection may be readily incorporated into the existing transmission network.

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3. For reliable operation, certain telecommunications, control, and protection equipment may need to be provided with redundancy.
4. The equipment for the new connection shall have sufficient capabilities for both the initial operation and for the long range operation.
5. Operations and maintenance personnel must be properly trained for both normal and emergency conditions.
6. Because of increased risks and potential hazards inherent with operating Interconnection Customer's facilities connected with SRP facilities, overall safety for life, quality of service and property is paramount. SRP shall disconnect Interconnection Customer's facilities anytime Interconnection Customer's facilities pose a dangerous condition, and such disconnection is appropriate to protect safety of SRP employees, customers, general public, or to maintain integrity of the SRP facilities. Interconnection Customer agrees to comply with SRP Safety and Hold Procedures in operation of its facilities.

F. Power Factor Considerations

SRP and Interconnection Customer shall jointly plan and operate their systems, including reactive devices, so as not to place an undue burden on either party to supply or absorb reactive power.

G. Metering and Telecommunications

All connections to the SRP electrical system at transmission voltage levels will require metering. The following paragraphs discuss typical requirements for metering and telecommunications associated with these connections.

Metering equipment shall be installed whenever possible at the point-of-connection between SRP and the customer. If the Metering Point and the Point-of-Connection are not at the same location, SRP reserves the right to require transformer losses and/or line losses to be considered. Metering equipment shall include a solid-state meter for each individual load capable of measuring MW demand, MVar demand, MWh, MVarh, and both leading or lagging power factor. If power flow is capable of being bi-directional the metering system shall be designed to capture delivered and received MWh and MVarh in separate registers. These registers may be included in a single meter approved by SRP. All metering packages used on the SRP system will be required to use revenue-accuracy-metering equipment, including the meter, instrument transformers, and associated devices. Relay-accuracy metering equipment is not acceptable for SRP billing metering. Upon request, SRP will make metering data available.

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SCADA may be required for any interconnection project including projects served entirely or partially from resources outside of the SRP Balancing Authority Area. An RTU is required to supply the following SCADA information:

1. Status and/or control isolating devices
2. Load voltage, MW and MVars at the point-of-connection

Substation transmission line MW and MVars. Maintenance requirements will be determined on a case-by-case basis.

Voice communication and communication requirements for protection purposes will be determined on a case-by-case basis. If required, a compatible and reliable communication media shall be provided for voice, SCADA and remote access to metering data. New communications facilities are designed to conform to company and system requirements. Communications facilities installed for the express purpose of supporting Power Operations conform to the applicable sections of the following:

1. WECC Guidelines for the Design of Critical Communications Circuits (Telecommunications Work Group)
2. WECC Communications Systems Performance Guide for Protective Relaying Applications (Telecommunications and Relay Work Groups)

Communications facilities are planned, engineered, constructed and tested per internal SRP I/S Procedures.

H. Equipment Ratings

1. Transmission Line Ratings

For transmission lines interconnecting into SRP facilities transmission line ratings shall meet the requirements of SRP transmission line design standards, including MVA, operating voltage, ampacity, insulation critical flashover, insulation clearances, shielding, tower grounding, and short circuit withstand requirements. In all cases, NESC and OSHA requirements shall be satisfied. Interconnection Customer shall make available to SRP all drawings and specifications, terminations plans, and line ratings.

2. Substation Facility Ratings

Substation facility ratings shall meet the requirements of SRP substation design and construction standards and must be designed to the applicable requirements of NESC, NEC, ANSI, and IEEE Standards. Electrical equipment in the substation must be sized to carry the full continuous and short time current ratings of the intercepted transmission path. All interrupting devices, such as circuit breakers shall have interrupting capability sufficient to satisfactorily interrupt the maximum short circuit currents that may occur at the location of the interconnection including margin for circuit breaker duty and DC offset. Where

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the substation becomes a facility within the intercepted transmission path, SRP shall become the engineer of the facility, shall procure all required equipment, and shall construct the facility.

I. Inspection, Testing, Calibration and Maintenance

All transmission elements (i.e. lines, line rights-of-way, circuit breakers, control and protection equipment, metering, and telecommunications) shall be inspected and maintained in conformance with regional standards. SRP may request an annual certification that the Interconnection Customer has documented and implemented an adequate transmission maintenance and inspection plan for its interconnecting facilities.

1. Pre-Energization Testing and Inspection

Pre-energization testing and inspection is the responsibility of the Interconnection Customer in accordance with a documented Inspection and Test Plan. Interconnection Customer shall make available to SRP all drawings, specifications, equipment settings, and test records of the interconnecting facilities.

2. Ongoing Maintenance and Inspection Planning

Ongoing maintenance and inspection planning of Interconnection Customer's facilities shall be conducted by the Interconnection Customer, and the Interconnection Customer shall include in its inspection plans the specific scheduled maintenance and inspection intervals and/or conditions that trigger maintenance and inspection. Such plans shall also describe the maintenance methods and the criteria to be used to assess the condition of facility components.

3. Maintenance Coordination

Each Party shall provide the other with reasonable notification for routine maintenance, operational tests, inspection activities and meter testing. For such activities that do not require major equipment or system outages, the Party performing the same shall provide the other Party notice at least twenty-four hours before scheduled outage. For such activities that will require major equipment or system outages, the Party performing the same activities shall provide the other Party notice at least seventy-two hours before scheduled outage.

J. Power Quality

All Interconnection Customers will be required to meet SRP and industry standards regarding voltage flicker and harmonic distortion and interference.

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K. Communications

Complete, precise, and timely communication is required for maintaining the reliability and security of a power system. Under normal operating conditions, the major link of communication with various interconnectors shall be by telephone lines. SRP and its Interconnection Customers shall maintain communication which shall include, but not be limited to, system paralleling or separation, scheduled or unscheduled shutdowns, equipment clearances, periodic load reports, maintenance schedules, tagging of interconnection interrupting devices, meter tests, relay tests, billing, and other routine communication. In case of emergency or abnormal operating conditions, various communication channels may be used. Emergency telephone numbers should be agreed upon by both Parties prior to the actual interconnection date.