



Guidelines for Generation Interconnection Requests to SPP's Transmission System (Revised 10-31-2011)

1. Application

To make a Generation Interconnection Request, the applicant shall complete the "Interconnection Request" (Appendix 1 and Attachment A to GIP) and return it to SPP along with a refundable deposit of \$10,000. Required information for a valid request, as stated by the procedure, is listed below,

- 1) Type of Interconnection Service requested,
- 2) Size (in MW) and location of the proposed plant,
- 3) Proposed method of interconnecting the plant to the SPP transmission system, and
- 4) In-service date of the proposed plant,
- 5) Name, address, phone number and e-mail of Interconnection Customer's contact person,
- 6) Approximate location of the proposed Point of Interconnection,
- 7) Interconnection Customer Data as set forth in Attachment A,
- 8) The specific interconnection queue the Interconnection Customer intends to enter. The choices are
 - Interconnection Feasibility Study (IFS) queue
 - Preliminary Interconnection System Impact Study (PISIS) queue
 - Definitive Interconnection System Impact Study (DISIS) queue
- 9) To enter the PISIS or DISIS queue, Interconnection Customer shall provide evidence of ownership in or right to acquire the site of the proposed plant.
 - To demonstrate full site control, the amount of land under control shall be sufficient to site the type of facility that is requested to interconnect. For a wind generating plant, the minimum accepted site control (without a wind turbine layout) is 30 acres / MW of wind generation. If the Interconnection Customer provides a reasonable site layout demonstrating it can site the wind generation on less acreage, SPP may accept such demonstration as acceptable site control.

Once received, SPP will review the completed application. The Interconnection Customer's initial \$10,000 shall be applied toward the study deposit of the applicable study queue in which application is requested. This prepayment cost shall be either wired to an account as designated by SPP or sent in with the initial Interconnection Request. Once the prepayment has been received, and the Interconnection Request has been validated the SPP will assign the project a queue position. The SPP will send the appropriate study agreement to the Interconnection Customer for execution.

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The Interconnection Customer will have fifteen days to return the study agreement along with the additional information listed below:

- Interconnection Feasibility Study Queue (IFS)
 - Feasibility Study Agreement
 - Deposit of \$10,000 for generation greater than 2MW

The Interconnection Customer will have thirty days to return the study agreement along with the additional information listed below:

- Preliminary Interconnection System Impact Study Queue (PISIS)
 - PISIS Agreement
 - Deposit of:
 - \$10,000 for generation less than or equal to 2 MW
 - \$25,000 for generation greater than 2 MW and less or equal to 20 MW
 - \$40,000 for generation greater than 20 MW and less than 100 MW
 - \$60,000 for generation greater than or equal to 100 MW and less than 800 MW
 - \$90,000 for generation greater than or equal to 800 MW
 - Technical Data
 - One-Line Diagram
 - Facility Data
 - Wind Turbine PSS/E model (if wind turbine)
 - Wind Farm data required in Appendix 7 of the LGIP
- Definitive Interconnection System Impact Study Queue (DISIS)
 - DISIS Agreement
 - Deposit of:
 - \$15,000 for generation less than or equal to 2 MW
 - \$50,000 for generation greater than 2 MW and less or equal to 20 MW
 - \$75,000 for generation greater than 20 MW and less than 75 MW
 - \$150,000 for generation greater than or equal to 75 MW
 - Definitive Point of Interconnection (cannot be changed)
 - Definitive plant size (MW) (cannot be changed)
 - Wind Turbine PSS/E model (if wind facility)
 - Wind Farm data required in Appendix 7 of the LGIP
 - One of the following:
 - Security equal to \$2000/MW of the plant size (refundable at commercial operation or if GIA is not executed by Interconnection Customer); or
 - An executed contract (or comparable evidence) for the sale of electric energy or capacity from the Generating Facility; or
 - Statement signed by an officer or authorized agent of the Interconnection Customer attesting that the Large Generating Facility is included in an applicable state resource plan; or
 - Other information that the Transmission Provider deems to be reasonable evidence that the Large Generating Facility will qualify as a Designated Resource; or

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- Purchase Order for generating equipment specific to Queue Position or statement signed by an officer or authorized agent of the Interconnection Customer attesting that the Generating Facility is included to be supplied with turbines with a manufacturer's blanket purchase agreement that Interconnection Customer is a party. This agreement shall be provided to Transmission Provider; or
- Application for an air permit (if applicable); or
- Filing a Notice of Proposed Construction or Alteration with the Federal Aviation Administration (if applicable).

Generation Interconnection Customers must request transmission service in accordance with the terms of SPP's Open Access Transmission Tariff.

SPP's Interconnection Agreement and the Interconnection Procedure may be downloaded by visiting SPP's website, www.spp.org, and going to the System Impact Studies page under Interconnection Documents. Any questions regarding Generation Interconnection requests can be addressed to:

Charles Hendrix
Manager, Generation
Interconnection
Studies
501-614-3546
chendrix@spp.org

Or

Juliano Freitas
Senior Engineer,
Generation
Interconnection Studies
501-688-1625
jfreitas@spp.org

Or

Brad Finkbeiner
Sr. Engineering Analyst,
Special Studies &
Engineering Support
501-688-1657
bfinkbeiner@spp.org

2. Queue Priority

DISIS queue positions have queue priority over PISIS queue positions. PISIS queue positions have priority over Feasibility Study queue positions.

3. Clustering Open Seasons

All interconnection requests that are entered into each of the specific interconnection queues in a 6 month window will be studied together in a cluster study format. The windows will be posted by SPP on the Generation Interconnection webpage.

4. Feasibility Study

The **Feasibility Study** assesses the practicality and costs involved to incorporate the generating unit or units into the SPP Transmission System. The analysis is limited to a linear power flow analysis of the more probable contingencies within the Transmission Owner's control area and key adjacent areas. The feasibility study does not include full AC power flow analysis, short circuit or stability studies. The generator will be modeled at the location and during the time period specified in the Feasibility Study Agreement.

Feasibility Study Methodology

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A power flow analysis is conducted with all requests in the IFS and DISIS queue that were requested in the previous open season window. The results of load flow analysis include power flow magnitudes under probable contingency conditions. The results of the load flow study will be used to identify equipment overloads. If an equipment overload is determined to be impacted by the interconnection request, a cost allocation of the mitigation will be assigned to the interconnection request that will be shared by other requests in the study that also impact the facility. The study shall be conducted using MUST.

SPP shall make reasonable efforts to complete the Feasibility Study within 90 calendar days after receipt of the executed Feasibility Study Agreement. After this study is completed, SPP will post the results of the Feasibility Study on the public SPP OASIS study page. Since this is a public site the customer's identity will be kept confidential.

5. Preliminary Interconnection System Impact Study

After completion of the Feasibility Study, SPP will send to the customer a Preliminary System Impact Study Agreement. The customer shall have 30 calendar days to review, execute and return the System Impact Study Agreement to SPP. At this time the customer shall either wire or send an additional prepayment for the Preliminary Interconnection System Impact Study. The remainder of the prepayment is refundable to the customer at the end of the process based on difference of the prepayment and the customer's cost responsibility of the study costs. If the agreement is not returned within 30 calendar days, the Customer's request shall be deemed withdrawn.

The **Preliminary Interconnection System Impact Study** consists of an AC power flow analysis and Transient Stability Study analysis of the Generation Interconnection Request. A power factor analysis will also be conducted for wind generating plants to determine whether such plants shall supply additional reactive power. The SPP shall make reasonable efforts to complete the System Impact within 150 calendar days after the close of the open season window. Studies may be performed either by SPP personnel, Transmission Owner personnel, or external contractors.

Preliminary Interconnection System Impact Study Methodology

A power flow analysis is conducted with all requests in the PISIS and DISIS queue that were requested in the previous open season window. The results of load flow analysis include power flow magnitudes and voltage levels under probable contingency conditions. The results of the load flow study will be used to identify equipment overloads. If an equipment overload is determined to be impacted by the interconnection request, a cost allocation of the mitigation will be assigned to the interconnection request that will be shared by other requests in the study that also impact the facility. The study shall be conducted using both MUST and the ACCC function of PSS/E.

A transient stability analysis will be performed to determine generator unit response due to a fault on the system and unit outages.

The stability analysis will include new transmission reinforcements that were determined to be necessary by the power flow analysis.

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The transient stability analysis will determine:

- 1) Unit stability during faults
- 2) Voltage levels, frequency levels, and frequency deviation at the point of interconnection
- 3) Synchronous generator rotor oscillations and real and reactive power outputs

This information will be collected before the disturbance, at the time of the disturbance, at discrete time intervals during the disturbance, and after the removal of the disturbance from the system.

System Impact Study Data Requirements

The following data will be required to begin the Detailed Interconnection Study:

- 1) Synchronous machine data
- 2) Exciter data and models
- 3) Governor data and models
- 4) Step up transformer data (positive and zero sequence)
- 5) Line impedance to interconnection point (positive and zero sequence)
- 6) Power system stabilizer data (if installed)
- 7) Short circuit data

SPP shall make reasonable efforts to complete the Impact Study within 150 calendar days after the close of the window. After this study is completed, SPP will post the results of the Impact Study on the public SPP OASIS study page. Since this is a public site the customer's identity will be kept confidential.

6. Definitive Interconnection System Impact Study

After completion of the Preliminary Interconnection System Impact Study, SPP will send to the customer a Definitive System Impact Study Agreement. The customer shall have 30 calendar days to review, execute and return the System Impact Study Agreement to SPP. At this time the customer shall either wire or send an additional prepayment for the Definitive Interconnection System Impact Study. The remainder of the prepayment is refundable to the customer at the end of the process based on difference of the prepayment and the customer's cost responsibility of the study costs. If the agreement is not returned within 30 calendar days, the Customer's request shall be deemed withdrawn.

The **Definitive Interconnection System Impact Study** consists of an AC power flow analysis and Transient Stability Study analysis of the Generation Interconnection Request. A power factor analysis will also be conducted for wind generating plants to determine whether such plants shall supply additional reactive power. The SPP shall make reasonable efforts to complete the System Impact within 150 calendar days after receipt of the executed System Impact Study Agreement. Studies may be performed either by SPP personnel, Transmission Owner personnel, or external contractors.

Definitive Interconnection System Impact Study Methodology

Guidelines for Adding Generation to SPP's Transmission System

A power flow analysis is conducted with all requests in the DISIS queue that were requested in the previous open season window. The results of load flow analysis include power flow magnitudes and voltage levels under probable contingency conditions. The results of the load flow study will be used to identify equipment overloads. If an equipment overload is determined to be impacted by the interconnection request, a cost allocation of the mitigation will be assigned to the interconnection request that will be shared by other requests in the study that also impact the facility. The study shall be conducted using both MUST and the ACCC function of PSS/E.

A transient stability analysis will be performed to determine generator unit response due to a fault on the system and unit outages.

The stability analysis will include new transmission reinforcements that were determined to be necessary by the power flow analysis.

The transient stability analysis will determine:

- 1) Unit stability during faults
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This information will be collected before the disturbance, at the time of the disturbance, at discrete time intervals during the disturbance, and after the removal of the disturbance from the system.

System Impact Study Data Requirements

The following data will be required to begin the Detailed Interconnection Study:

- 1) Synchronous machine data
- 2) Exciter data and models
- 3) Governor data and models
- 4) Step up transformer data (positive and zero sequence)
- 5) Line impedance to interconnection point (positive and zero sequence)
- 6) Power system stabilizer data (if installed)
- 7) Short circuit data

SPP shall make reasonable efforts to complete the Impact Study within 120 calendar days after the close of the window. After this study is completed, SPP will post the results of the Impact Study on the public SPP OASIS study page. Since this is a public site the customer's identity will be kept confidential.

7. Facility Study

Upon completion of the Definitive Interconnection System Impact Study, SPP will send the customer a Facility Study Agreement. The customer shall have 30 calendar days to review, execute and return the Facility Study Agreement to SPP. At this time the customer shall provide the following milestones within 30 calendar days or the Customer's request shall be deemed withdrawn.

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- One of the following:
 - Letter of credit or payment of Interconnection Customer's share of estimated Network Upgrades less any amounts already provided (refundable if GIA is not executed by Interconnection Customer).
 - An executed contract (or comparable evidence) for the sale of electric energy or capacity from the Generating Facility; or
 - Statement signed by an officer or authorized agent of the Interconnection Customer attesting that the Large Generating Facility is included in an applicable state resource plan; or
 - Other information that the Transmission Provider deems to be reasonable evidence that the Large Generating Facility will qualify as a Designated Resource; or
 - Purchase Order for generating equipment specific to Queue Position or statement signed by an officer or authorized agent of the Interconnection Customer attesting that the Generating Facility is included to be supplied with turbines with a manufacturer's blanket purchase agreement that Interconnection Customer is a party. This agreement shall be provided to Transmission Provider; or
 - Application for an air permit (if applicable); or
 - Filing a Notice of Proposed Construction or Alteration with the Federal Aviation Administration (if applicable).

The Facility Study consists of two parts, a Facility Analysis and a Short Circuit Analysis. The Facility Analysis consists of SPP or Transmission Owner specifying and estimating the cost of equipment, engineering, procurement and construction cost needed to implement the Interconnection to the Transmission system. These facilities will have detailed cost estimates.

A short circuit (*i.e.*, fault current) analysis will be performed to determine the effect that the new generation will have on the system fault currents. The new fault current levels will be used to evaluate the impact of the new generation on the fault duty (*i.e.*, fault current interrupting capability or rating) of existing equipment, such as circuit breakers and switches. The results of this analysis may identify which equipment would have to be replaced as a result of the new generation.

The deliverables of this study will be a Facility Study Report. SPP and Transmission Owner shall make reasonable efforts to complete the Facility Study within 90 Calendar days.

After this study is completed, SPP will post the results of the Facility Study on the public SPP OASIS study page. Since this is a public site the customer's identity will be kept confidential.

8. Re-Study

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If Re-Study of the Interconnection Customer's request for interconnection is required due to a higher queued project or equally queued project (in the same window) dropping out of the queue or a modification of a higher queued project the SPP shall notify the Interconnection Customer in writing. The SPP shall make reasonable efforts to complete the re-study within 60 Calendar days from the notice. Any cost of re-study shall be born by the Interconnection Customer. The Interconnection Customer shall be responsible for prepaying the cost of the re-study.

9. Generation Interconnection Agreement

Upon completion of the Facility Study, SPP shall send the Customer, as soon as practical, a Generation Interconnection Agreement (GIA) to be executed by the Customer, SPP, and the Transmission Owner. The agreement allows a physical interconnection of the generator to the SPP transmission grid. Other documents may also be required depending on the individual circumstances. Within 15 Business days after receipt of the final GIA the Interconnection Customer shall provide the SPP (A) reasonable evidence that continued site control or (B) posting of \$ 250,000, non-refundable additional security, which shall be applied toward future construction costs.

At the same time the Customer shall provide reasonable evidence that one or more of the following milestones in the development of the Facility, at the Interconnection customer election, has been achieved: (i) the execution of a contract for the supply or transportation of fuel to the Facility; (ii) the execution of a contract for the supply of cooling water to the Facility; (iii) execution of a contract for the engineering for, procurement of major equipment for, or construction of the Facility; (iv) execution of a contract for the sale of electric energy or capacity from the Facility; (v) statement signed by an officer or authorized agent of the Interconnection Customer attesting the Generating Facility is included in an applicable state resource plan; (vi) other information that the Transmission Provider deems to be reasonable evidence that the Generating Facility will qualify as a Designated Resource; or (vii) application for an air, water, or land use permit.

SPP, the Transmission Owner and the Interconnection Customer shall negotiate concerning any disputed provisions of the Appendices to the draft GIA for not more than 60 Calendar days after tender of the draft GIA. If the Interconnection Customer determines that negotiations are at an impasse, it may request termination of negotiations at any time after tender of the GIA and request submission of the unexecuted GIA with FERC or initiate Dispute Resolution procedures. If the Interconnection Customer requests termination of the negotiations, but within the 60 Calendar days thereafter fails to request either the filing of the unexecuted GIA or initiate Dispute Resolution, it is deemed to have withdrawn its Interconnection Request. Unless otherwise agreed by the Parties, if the Interconnection Customer has not executed the GIA, requested filing of an unexecuted GIA or initiated Dispute Resolution procedures within 60 Calendar days of tender of completed draft of the GIA Appendices, it shall be deemed to have withdrawn its Interconnection Request. The SPP shall provide to the Interconnection Customer a final GIA within 15 Business days after the completion of the negotiation process.

Transmission service may be arranged for separately under the terms and conditions of SPP's Open Access Transmission Tariff.

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