BEFORE THE PUBLIC UTILITY COMMISSION

OF OREGON

UM 1967

SANDY RIVER SOLAR, LLC, Complainant, vs. PORTLAND GENERAL ELECTRIC COMPANY, Defendant.	**PORTLAND GENERAL ELECTRIC COMPANY'S RESPONSES TO COMPLAINT'S FIRST SET OF DATA REQUESTS**

Defendant Portland General Electric Company ("PGE") responds as follows to Complainant Sandy River Solar's First Set of Data Requests:

GENERAL OBJECTIONS

1. PGE's responses are made to the best of its knowledge, information, and belief. PGE's responses are at all times subject to such additional discovery or investigation that further discovery or investigation may disclose and are subject to such refreshing of recollection, and such additional knowledge of facts, as may result from further discovery or investigation.

2. By stating in these responses that PGE will produce documents or provide information (subject to protective order or otherwise), PGE does not represent that any documents or information actually exists, but rather that in good faith PGE will search and attempt to ascertain whether such documents or information does, in fact, exist.

3. PGE objects to Complainant's requests to the extent those requests seek documents or information that is subject to the attorney-client privilege, the work produce doctrine, or any other applicable privilege on the ground that such documents or information is exempt from discovery.

4. PGE objects to all definitions, instructions, and document requests to the extent Complainant seeks documents not currently in PGE's possession, custody, or control, or refer to persons, entities or events not known to PGE, on the grounds that such definitions or requests seek to require more of PGE than any obligation imposed by law, would subject PGE to unreasonable and undue annoyance, oppression, burden, and expense, and would seek to impose on PGE an obligation to investigate or discover information or materials from third parties or sources that are equally accessible to Complainant.

5. PGE reserves all objections or other questions as to the competency, authenticity, relevance, materiality, privilege, or admissibility as evidence in any subsequent proceeding in, or trial of, this or any other action for any purpose whatsoever of this response and any document or thing produced in response to Complainant's requests.

6. PGE objects to Complainant's requests to the extent they seek to impose obligations on PGE not authorized by Public Utility Commission of Oregon ("Commission") rules or the Oregon Rules of Civil Procedure.

7. PGE objects to the instructions set forth in Complainant's First Set of Data Requests to the extent that those instructions impose obligations on PGE that exceed, are unauthorized by, or are inconsistent with applicable discovery rules, including OAR 860-001-500 to OAR 860-001-540.

8. PGE objects to Complainant's requests to the extent they are vague, ambiguous, unintelligible, overly broad as to time and subject matter, seek irrelevant and/or immaterial information, to the extent they are not reasonably calculated to lead to the discovery of admissible evidence, and/or to the extent they cause undue burden, harassment, or annoyance.

9. Each of these general objections is incorporated into each of PGE's specific responses as if set forth in full below.

RESPONSES TO INDIVIDUAL REQUESTS

Sandy River Solar Data Request No. 001:

Please indicate the higher-queued projects that the Sandy River Solar interconnection is subject to. For each of these higher-queued projects, please provide:

a. The Feasibility, System Impact, and Facilities studies;

b. The current construction timeline including all milestones;

c. The construction timeline including all milestones that existed on January 7, 2018 when PGE provided Sandy River with the System Impact Study;

d. The construction timeline including all milestones that existed on April 25, 2018 when PGE provided Sandy River with the Facilities Study; and

e. The construction timeline including all milestones that existed on July 27, 2018 when PGE provided Sandy River with the Revised Facilities Study.

Response to Sandy River Solar Data Request No. 001:

In addition to the general objections stated above, PGE objects to Sandy River Solar's Data Request No. 001 and each of its sub-parts on the grounds that they are vague, ambiguous, unintelligible, overbroad, unduly burdensome, seek irrelevant information, and/or seek information whose probative value is substantially outweighed by a danger of unfair prejudice, confusing the issues, subjecting PGE to undue burden, or needlessly presenting cumulative evidence. Notwithstanding and without waiving PGE's general objections or these specific objections, PGE responds to each sub-part of Complainant's Data Request No. 001 as follows:

Please indicate the higher-queued projects that the Sandy River Solar interconnection is subject to.

PGE has received three interconnection requests for the Dunns Corner-13 feeder that are or were higher-queued than the Sandy River Solar interconnection request: SPQ0010, SPQ0051 and SPQ0070. SPQ0051 withdrew its application on February 21, 2018, after receiving a System Impact Study. As a result, there are currently two higher-queued interconnection applications on the Dunns Corner-13 feeder: SPQ0010 and SPQ0070.

For each of these higher-queued projects, please provide:

a. The Feasibility, System Impact, and Facilities studies;

SPQ0010: There was no Feasibility Study conducted for SPQ0010. A copy of the System Impact Study Report for SPQ0010 with project identifying information redacted is provided in Attachment 001A. A copy of the Facilities Study Report for SPQ0010 with

project identifying information redacted is provided in Attachment 001B.

SPQ0051: There was no Feasibility Study for SPQ0051. A copy of the System Impact Study Report for SPQ0051 with project identifying information redacted is provided in Attachment 001C. There was no Facilities Study for SPQ0051 because the applicant withdrew after the System Impact Study.

SPQ0070: There was no Feasibility Study conducted for SPQ0070. A copy of the System Impact Study Report for SPQ0070 with project identifying information redacted is provided in Attachment 001D. A copy of the Facilities Study Report for SPQ0070 with project identifying information redacted is provided in Attachment 001E.

b. The current construction timeline including all milestones;

It is unclear what Sandy River Solar seeks when it requests the construction timelines and milestones in effect on the dates specified in sub-parts (b), (c), (d) and (e). PGE assumes that Sandy River Solar seeks the construction timeline and associated milestones stated in the Interconnection Agreement for each higher-queued interconnection request that was in effect on the dates specified in each sub-part. Alternatively, if there was no Interconnection Agreement on the date specified, PGE assumes Sandy River Solar seeks the construction timeline and associated milestones that were proposed in the Facilities Study that was in effect on the dates specified in each sub-part. PGE has responded based on these assumptions.

SPQ0010: A copy of the current construction timeline, including all milestones, from the Interconnection Agreement for SPQ0010 is provided in Attachment 001F.

SPQ0051: There is no current construction timeline or milestones for SPQ0051 because the applicant withdrew after the System Impact Study and no Facilities Study or Interconnection Agreement was issued.

SPQ0070: A copy of the current construction timeline, including all milestones, from the Interconnection Agreement for SPQ0070 is provided in Attachment 001G.

c. The construction timeline including all milestones that existed on January 7, 2018 when PGE provided Sandy River with the System Impact Study;

SPQ0010: A copy of the current construction timeline, including all milestones, from the Interconnection Agreement for SPQ0010 is provided in Attachment 001F. This construction timeline existed on January 7, 2018 when PGE provided Sandy River Solar a System Impact Study.

There were no construction timelines in existence for SPQ0051 and SPQ0070 on January 7, 2018, because there were no Facilities Studies or Interconnection Agreements for those projects on that date.

d. The construction timeline including all milestones that existed on April 25, 2018 when PGE provided Sandy River with the Facilities Study; and

SPQ0010: A copy of the current construction timeline, including all milestones, from the Interconnection Agreement for SPQ0010 is provided in Attachment 001F. This construction timeline existed on April 25, 2018 when PGE provided Sandy River Solar a Facilities Study.

SPQ0070: A copy of the proposed construction timeline, including all proposed milestones, from the Facilities Study for SPQ0070 is provided in Attachment 001E. This proposed construction timeline existed on April 25, 2018 when PGE provided Sandy River Solar a Facility Study.

There were no construction timelines in existence for SPQ0051 on April 25, 2018, because there was no Facilities Study or Interconnection Agreement for the project on that date.

e. The construction timeline including all milestones that existed on July 27, 2018 when PGE provided Sandy River with the Revised Facilities Study.

SPQ0010: A copy of the current construction timeline, including all milestones, from the Interconnection Agreement for SPQ0010 is provided in Attachment 001F. This construction timeline existed on July 27, 2018 when PGE provided Sandy River Solar with a Revised Facilities Study.

SPQ0070: A copy of the current construction timeline, including all milestones, from the Interconnection Agreement for SPQ0070 is provided in Attachment 001G. This construction timeline existed on July 27, 2018 when PGE provided Sandy River Solar with a Revised Facilities Impact Study.

There were no construction timelines in existence for SPQ0051 on July 27, 2018 when PGE provided Sandy River Solar with a Revised Facilities Impact Study, because there was no Facilities Study or Interconnection Agreement for the project on that date.

Sandy River Solar Data Request No. 002:

Please refer to paragraph 186 of PGE's Answer:

a. What are PGE's concerns regarding a potential conflict of interest if PGE's agrees to allow Sandy River Solar to hire its own third-party consultant to construction the interconnection facilities?

b. What are PGE's concerns regarding its loss of control over safety and/or reliability of its system if PGE's agrees to allow Sandy River Solar to hire its own third-party consultant to construction the interconnection facilities?

c. What are PGE's concerns regarding cost and complexity if PGE's agrees to allow Sandy River Solar to hire its own third-party consultant to construction the interconnection facilities?

Response to Sandy River Solar Data Request No. 002:

In addition to the general objections stated above, PGE objects to Sandy River Solar's Data Request No. 002 and each of its sub-parts on the grounds that they are vague, ambiguous, unintelligible, overbroad, unduly burdensome, seek irrelevant information, and/or seek information whose probative value is substantially outweighed by a danger of unfair prejudice, confusing the issues, subjecting PGE to undue burden, or needlessly presenting cumulative evidence. PGE further objects that Data Request No. 002 and its sub-parts seek PGE's legal arguments or legal conclusions, which are not appropriate subjects for a data request. PGE further objects to Data Request No. 002 to the extent it seeks to compel PGE to develop information for Sandy River Solar or seeks privileged information. PGE further objects to the extent that Data Request No. 002 seeks to limit PGE's ability to present argument as to why PGE is concerned with authorizing an interconnection customer to hire a third-party consultant to construct the interconnection facilities. PGE's responses to Data Request No. 002 are not necessarily exhaustive and PGE reserves its right to supplement its response or to raise any arguments at anytime during this proceeding. Notwithstanding and without waiving PGE's general objections or these specific objections, PGE responds to each sub-part of Complainant's Data Request No. 001 as follows:

a. *What are PGE's concerns regarding a potential conflict of interest if PGE's agrees to allow Sandy River Solar to hire its own third-party consultant to construction the interconnection facilities?*

   PGE has a number of concerns regarding a potential divergence or conflict of interest including, but not limited to, the following. PGE has a duty to serve its customers and to ensure the safe, reliable and cost-effective operation of it electric system. A qualifying facility interconnection customer and its third-party consultant have no such duty to serve the public or to maintain a safe, reliable, and cost-effective electric utility system. If the interconnection customer hires a third-party consultant to construct required interconnection facilities or system upgrades on PGE's system, then that third-

party consultant's contractual and fiduciary duties will extend to the interconnection customer not to PGE and not to the public that PGE serves. PGE believes this divergence or conflict of interests would make it considerably more expensive, time-consuming, and risky for PGE to allow interconnection customers to hire third-party consultants to do interconnection work as compared to PGE doing the work itself or hiring its own consultants with whom PGE will have privity of contract and over which PGE will enjoy a greater level of control.

In addition, maintenance of PGE's system could suffer from design and/or construction by a third party whose efforts are predicated on making a profit from the work rather than on establishing a safe, reliable, durable, and easily maintained electric system.

b. *What are PGE's concerns regarding its loss of control over safety and/or reliability of its system if PGE's agrees to allow Sandy River Solar to hire its own third-party consultant to construction the interconnection facilities?*

PGE has a number of concerns regarding potential loss of control over the safety and/or reliability of its system, including without limitation the concerns discussed in sub-part (a) above and the following additional concerns. PGE has a duty to serve the public generally and an obligation to ensure the safety and reliability of its system. By conducting necessary interconnection work itself, or by hiring its own third-party consultants to conduct necessary interconnection work, PGE can exercise direct control over all aspects of the work and best ensure that the work is conducted in a safe manner, that the work minimizes impacts on the safety and reliability of the larger system, that the final product of the work is safe and reliable, and that PGE has complete control over, and information regarding, its system. Additionally, PGE believes that it would prove to be more difficult, costly, and time consuming and less effective for PGE to try to oversee the practices and product of a consultant working for another party than it would be for PGE to conduct the work itself or hire its own consultants to conduct the work.

In order to adequately ensure that the interconnection customer's third-party consultant is conducting its work in a safe manner and that the results of the work are safe and reliable, PGE would have to insist on a series of rights and obligations in it contractual relationship with the interconnection customer that would allow PGE to effectively control and monitor the interconnection customer's third-party consultant and ensure that the third party consultant meets PGE's requirements around licensing, insurance and safety. Such an arrangement is ultimately more burdensome, time consuming, and expensive than PGE simply hiring a third-party consultant itself.

Allowing third-party consultants to construct interconnection facilities could jeopardize the safety of the consultants as well as PGE's employees, could jeopardize the security of PGE's transmission and distribution system, and could jeopardize reliability of service to existing customers. PGE could not easily or adequately ensure that the interconnection customer's third-party consultant or its employees were qualified to perform the required work, had necessary safety training, or would be coordinated with other work being performed on PGE's system.

c. *What are PGE's concerns regarding cost and complexity if PGE's agrees to allow Sandy River Solar to hire its own third-party consultant to construction the interconnection facilities?*

PGE has a number of concerns regarding the cost and complexity of allowing an interconnection customer to hire a third-party consultant to construct needed interconnection facilities and system upgrades, including without limitation the concerns discussed in sub-parts (a) and (b) above and the following additional concerns. In order to ensure that any new interconnection facilities or system upgrades are safe and reliable PGE would be required to exercise close supervision and oversight of the interconnection customer's third-party contractor and that supervision and oversight would likely be more complex, expensive, time consuming, and ultimately less effective when it is conducted second hand with PGE trying to supervise a consultant who is working for someone else. The process of oversight and management is simpler, more efficient, and ultimately more cost effective if a third-party consultant works directly for PGE and PGE therefore enjoys privity of contract with the third-party consultant.

In addition, PGE has a large number of capital, maintenance, and customer-driven construction projects on its system at all times. Completing these construction activities requires a high level of coordination on scheduling, mobilization, procurement, construction, testing and energization. PGE's work management processes and procedures allow PGE to complete this work safely and reliably, with crews that have been trained to work within PGE's approved work practices and procedures.

Sandy River Solar Data Request No. 003:

Under PGE's FERC-jurisdictional Large Generator Interconnection Procedures and Large Generator Interconnection Application, has PGE allowed an interconnection customer the option to build or hire a third-party consultant to build all of part of the required interconnection facilities and stand-along system upgrades? If not, please explain why not. If so, please provide:

a. The size of the generator,

b. The interconnection requirements,

c. The cost of the interconnection, and

d. The processes and procedures in place to ensure there were not conflicts of interest and no unacceptable loss of control over safety and/or reliability.

Response to Sandy River Solar Data Request No. 003:

PGE has not had a non-affiliate interconnection under the FERC Large Generator Interconnection Process.

Sandy River Solar Data Request No. 004:

Under PGE's FERC-jurisdictional Small Generator Interconnection Procedures and Small Generator Interconnection Application, has PGE allowed an interconnection customer the option to build or hire a third-party consultant to build all or part of the interconnection facilities and stand-along system upgrades? If not, please explain why not. If so, please provide:

a. The size of the generator,

b. The interconnection requirements,

c. The cost of the interconnection, and

d. The processes and procedures in place to ensure there were not conflicts of interest and no unacceptable loss of control over safety and/or reliability.

Response to Sandy River Solar Data Request No. 004:

PGE has not had a non-affiliate interconnection under the FERC Small Generator Interconnection Process.

Sandy River Solar Data Request No. 005:

Please state PGE's understanding of whether and why PacifiCorp and Idaho Power allow interconnection customers to construct the interconnection themselves or hire third parties to construct their interconnection.

Response to Sandy River Solar Data Request No. 005:

In addition to the general objections stated above, PGE objects to Sandy River Solar's Data Request No. 005 on the grounds that it is vague, unduly burdensome, seeks irrelevant information, and/or seeks information whose probative value is substantially outweighed by a danger of unfair prejudice, confusing the issues, subjecting PGE to undue burden, or needlessly presenting cumulative evidence. PGE further objects to Sandy River Solar's Data Request No. 005 on the grounds that responding to the request would require PGE to develop information for another party or to speculate regarding the actions and motivation of PacifiCorp and Idaho Power. Notwithstanding and without waiving PGE's general objections or these specific objections, PGE responds to each sub-part of Complainant's Data Request No. 005 as follows:

PGE does not know whether PacifiCorp or Idaho Power allow qualifying facilities to construct the interconnection facilities or system upgrades required under OAR Chapter 860, Division 082 and PGE does not know whether PacifiCorp or Idaho Power allow qualifying facilities to hire third parties to construct such interconnection facilities or system upgrades.

Sandy River Solar Data Request No. 006:

Please refer to paragraph 188 in PGE's Answer. Please list all instances where PGE has allowed an interconnection applicant/customer to conduct certain work.

Response to Sandy River Solar Data Request No. 006:

In addition to the general objections stated above, PGE objects to Sandy River Solar's Data Request No. 006 and each of its sub-parts on the grounds that they are vague, ambiguous, unintelligible, overbroad, unduly burdensome, seek irrelevant information, and/or seek information whose probative value is substantially outweighed by a danger of unfair prejudice, confusing the issues, subjecting PGE to undue burden, or needlessly presenting cumulative evidence. Notwithstanding and without waiving PGE's general objections or these specific objections, PGE responds to each sub-part of Complainant's Data Request No. 006 as follows:

PGE is generally willing to allow an interconnection applicant to construct and install interconnection equipment or interconnection facilities that will be owned by the applicant and located on the applicant's property or up to the PGE owned facility (e.g., pole).

Additionally, PGE has generally allowed interconnection applicants to trench and install the pathway (conduit, vaults, pads), and the meterbase, that is located on customer property or up to the PGE owned facility (e.g., pole). PGE is generally unwilling to allow an interconnection applicant or its third-party consultant to construct and install system upgrades or interconnection facilities that are located on PGE's facilities (e.g., cable, switches, poles, fuses, etc.).

Sandy River Solar Data Request No. 007:

Admit or deny that PGE's cost estimate for the Distribution Requirements decreased by $60,000 from the estimate in the System Impact Study $90,000 to the estimate in the Facilities Study of $30,000. If admitted, explain why the change in cost.

Response to Sandy River Solar Data Request No. 007:

In addition to the general objections stated above, PGE objects to Sandy River Solar's Data Request No. 007 on the grounds that its is vague, ambiguous, unintelligible, overbroad, unduly burdensome, seeks irrelevant information, and/or seeks information whose probative value is substantially outweighed by a danger of unfair prejudice, confusing the issues, subjecting PGE to undue burden, or needlessly presenting cumulative evidence. Notwithstanding and without waiving PGE's general objections or these specific objections, PGE responds to Complainant's Data Request No. 007 as follows:

PGE admits the cost estimate for the Distribution Requirements decreased by $60,000 from the System Impact Study to the Facilities Study. The cost decreased because the System Impact Study required the installation of an electronic recloser at the point of interconnection at an estimated cost of $60,000 and this requirement was eliminated in the Facilities Study.

Sandy River Solar Data Request No. 008:

Please detail what costs are included in the $30,000 for distribution requirements and the $92,954 for communications requirements, as shown in PGE's revised Facilities Study. For example, please detail the portions of these costs that are allocated for equipment, engineering, procurement, labor, and construction.

Response to Sandy River Solar Data Request No. 008:

In addition to the general objections stated above, PGE objects to Sandy River Solar's Data Request No. 008 on the grounds it is vague and ambiguous, overbroad, unduly burdensome, seeks irrelevant information, and/or seeks information whose probative value is substantially outweighed by a danger of unfair prejudice, confusing the issues, subjecting PGE to undue burden, or needlessly presenting cumulative evidence. PGE further objects to Data Request No. 008 to the extent its seeks to require PGE to provide information not required by OAR Chapter 860, Division 082, or any applicable Commission orders. Notwithstanding and without waiving these objections, PGE responds to Sandy River Solar's Data Request No. 008 as follows:

Distribution Modifications	
New Primary Service Conductor, Bi-Directional Meter, CT's and PT's	$30,000.00
Sub Total	$30,000.00
Communication Requirements	
Transfer Trip using SEL Mirror Bit Protocol	
Fiber Optic Cable	$81,794.00
Meet Me Cabinet at Generation Site	$10,440.00
New Fiber Optic Terminations, Patch Panel Work at Substation	$720.00
Sub Total	$92,954.00
Total	$122,954.00

These non-binding, good-faith estimates of the cost of the required interconnection facilities and system upgrades include the estimated cost of equipment, engineering, procurement, and construction. These estimated costs do not include the cost of work to be performed by Sandy River Solar.

Sandy River Solar Data Request No. 009:

Please refer to paragraphs 21, 34, and 76 of PGE's Answer.

a. When did PGE inform Troy Snyder that the "Distribution Requirements" refers to the required service and metering package and that "Communications Requirements" refers to the required transfer trip scheme with fiber optic communications channel?

b. Please detail exactly what PGE stated to Troy Snyder.

c. Please provide the names, contact information, and service address for all PGE staff that informed Troy Snyder of the information in subsection (a) of this request.

Response to Sandy River Solar Data Request No. 009:

In addition to the general objections stated above, PGE objects to Sandy River Solar's Data Request No. 009 and each of its sub-parts on the grounds that they are vague, ambiguous, unintelligible, overbroad, unduly burdensome, seek irrelevant information, and/or seek information whose probative value is substantially outweighed by a danger of unfair prejudice, confusing the issues, subjecting PGE to undue burden, or needlessly presenting cumulative evidence. Notwithstanding and without waiving PGE's general objections or these specific objections, PGE responds to each sub-part of Complainant's Data Request No. 009 as follows:

Please refer to paragraphs 21, 34, and 76 of PGE's Answer.

a. When did PGE inform Troy Snyder that the "Distribution Requirements" refers to the required service and metering package and that "Communications Requirements" refers to the required transfer trip scheme with fiber optic communications channel?

Mr. Snyder has submitted at least 25 separate interconnection applications to PGE. As part of processing those requests, PGE employee Jason Zappe has participated in numerous phone calls and in-person meetings with Mr. Snyder where the subject of interconnection cost estimates was discussed. At various times during such discussions PGE's representatives indicated that PGE's use of the term "Distribution Requirements" in PGE's study results refers to the required service and metering package and that PGE's use of the term "Communications Requirements" refers to required transfer trip with a fiber optic communication channel. Mr. Snyder did not indicate any confusion regarding this nomenclature.

Mr. Snyder never indicated to PGE that he had any questions, concerns, or confusion regarding the meaning of the terms "Distribution Requirements" and "Communications Requirements" as used by PGE in the System Impact Study, Facilities Study, or Revised Facilities Study for the Sandy River Solar project.

b. Please detail exactly what PGE stated to Troy Snyder.

PGE does not have a record of exactly what was said to Mr. Snyder.

c. Please provide the names, contact information, and service address for all PGE staff that informed Troy Snyder of the information in subsection (a) of this request.

Jason Zappe. Contact information and service address are provided in response to Data Request No. 016.

Sandy River Solar Data Request No. 010:

Admit or deny that PGE's estimate to design, procure, and construct the interconnection changed from 16 months in the System Impact Study to 18 months in the Facilities Study.

Response to Sandy River Solar Data Request No. 010:

PGE admits the estimated construction timeline changed from 16 months in the System Impact Study to 18 months in the Facilities Study.

Sandy River Solar Data Request No. 011:

Admit or deny that PGE stated that the "actual work will likely take around three weeks and potentially longer if we need to replace poles."

a. Is this a true statement?

b. Will PGE need to replace poles?

c. If PGE will need to replace poles, how long will the actual work take?

Response to Sandy River Solar Data Request No. 011:

In addition to the general objections stated above, PGE objects to Sandy River Solar's Data Request No. 011 and each of its sub-parts on the grounds that they are vague, ambiguous, unintelligible, overbroad, unduly burdensome, seek irrelevant information, ask PGE to speculate, and/or seek information whose probative value is substantially outweighed by a danger of unfair prejudice, confusing the issues, subjecting PGE to undue burden, or needlessly presenting cumulative evidence. Notwithstanding and without waiving PGE's general objections or these specific objections, PGE responds to each sub-part of Complainant's Data Request No. 011 as follows:

Admit or deny that PGE stated that the "actual work will likely take around three weeks and potentially longer if we need to replace poles."

PGE admits that in a June 6, 2018 email from PGE employee Jason Zappe to Troy Snyder, Mr. Zappe stated: "The actual work will likely take around three weeks and potentially longer if we need to replace poles to accommodate the transfer trip." A copy of this email communication was filed with the Commission as Exhibit H to PGE's Answer in this matter.

a. Is this a true statement?

Yes, it's a true statement. If it is not necessary to replace any poles to accommodate the transfer trip, PGE believes the work of installing the necessary interconnection facilities or system upgrades should take approximately three weeks. However, the work could take considerably longer if it proves necessary to replace poles to accommodate the transfer trip. As PGE has previously explained to Sandy River Solar, most of the time provided for in the estimated construction schedule is to allow time for higher queued interconnection project SPQ0070 to be completed. That project includes the installation of new relays at the substation that are a necessary requirement for the Sandy River Solar interconnection. If Sandy River Solar wishes to proceed without taking responsibility for the procurement and installation of these new substation relays, it is necessary to build time into the construction schedule to wait for the higher queued interconnection to be completed.

b. Will PGE need to replace poles?

PGE does not currently know whether it will be necessary to replace any poles, and if so, how many poles will need to be replaced. The detailed engineering determination on pole replacement takes place after a signed interconnection agreement and funding has been received.

c. If PGE will need to replace poles, how long will the actual work take?

The duration of the work is highly dependent on the number of poles to be replaced and the permitting requirements of the jurisdiction where the work is performed. As previously stated, PGE does not currently know whether it will be necessary to replace any poles or how many poles may need to be replaced. As a result, PGE cannot estimate how much time may be required, if any, to conduct pole replacement work.

Sandy River Solar Data Request No. 012:

Admit or deny that PGE stated that "the current volume of both interconnection and PGE's existing construction work has placed a strain on resources." Is this a true statement?

Response to Sandy River Solar Data Request No. 012:

PGE admits that PGE employee Jason Zappe sent Sandy River Solar representative Troy Snyder an email on June 6, 2018, which stated in part: "With the current volume of both interconnection and PGE's existing construction work has placed a strain on resources." A copy of this email has been submitted in this proceeding as Exhibit H to PGE's Answer.

At the time of the statement PGE was experiencing a large volume of Small Generator Interconnection Requests. A number of those requests were moving into construction and PGE experienced a period of adjustment in terms of the volume of applications received as well as the volume moving to construction. The "strain on resources" referred to by Mr. Zappe was a temporary circumstance. PGE has since adjusted its resources to better serve these customers. Additional resources have been added to the Customer Interconnection Group and PGE has assembled a dedicated line crew to work solely on Small Generator Interconnections in 2019.

Sandy River Solar Data Request No. 013:

Please provide the design specifications for Sandy River Solar's interconnection.

Response to Sandy River Solar Data Request No. 013:

In addition to the general objections stated above, PGE objects to Sandy River Solar's Data Request No. 013 on the grounds that it is vague, ambiguous, unintelligible, overbroad, unduly burdensome, seek irrelevant information, ask PGE to speculate, and/or seek information whose probative value is substantially outweighed by a danger of unfair prejudice, confusing the issues, subjecting PGE to undue burden, or needlessly presenting cumulative evidence. Notwithstanding and without waiving PGE's general objections or these specific objections, PGE responds to each sub-part of Complainant's Data Request No. 013 as follows:

The current design specification for the interconnection of the proposed Sandy River Solar project has been provided to Sandy River Solar by PGE through the Revised Facilities Study submitted to Sandy River Solar on July 27, 2018 and attached to the Complaint as Attachment C. In summary, the design for the interconnection involves the installation of the following components:

Distribution Modifications
New Primary Service Conductor, Bi-Directional Meter, CT's and PT's
Communication Requirements
Transfer Trip using SEL Mirrored Bits Protocol
Fiber Optic Cable (from the substation to the Sandy River Solar facility)
Meet Me Cabinet at Generation Site
New Fiber Optic Terminations, Patch Panel Work at both the Substation and the Sandy River Site
Potential Pole Replacements Determined During Detailed Engineering Analysis

Sandy River Solar Data Request No. 014:

Please list the equipment required to safely interconnect the Sandy River Solar facility.

Response to Sandy River Solar Data Request No. 014:

Given the assumptions stated in the Revised Facilities Study, the following facilities are required to interconnect the Sandy River Solar facility (if any of the underlying assumptions change before an Interconnection Agreement is executed, then the required facilities may also change):

Distribution Modifications:

- New Primary Service Conductor
- Bi-Directional Meter
- CTs and PTs

Communication Requirements: (Transfer Trip using SEL Mirrored Bits Protocol)

- Fiber Optic Cable from the Substation to the Sandy River Solar Facility
- Meet Me Cabinet at Generation Site
- New Fiber Optic Terminations, Patch Panel Work at both the Substation and the Sandy River Solar Facility
- Potential Pole Replacements as Determined During detailed Engineering Analysis

Additionally, the SEL-487E transformer relay requirements being installed under SPQ0070 must be complete for Sandy River Solar to interconnect. The estimated construction schedule proposed as part of the Revised Facilities Study includes time to allow the completion of such work as part of the interconnection of SPQ0070, which is a necessary requirement for the Sandy River Solar interconnection.

Sandy River Solar Data Request No. 015:

For each interconnection application for solar facilities that are less than 3 MW submitted since January 2015, please provide:

a. The nameplate capacity of the solar facility;

b. The requirements for that interconnection;

c. The length of time PGE required to complete each study;

d. The cost estimates in each study;

e. The timeline estimates to design, procure, and construct detailed in each study including all milestones;

f. The actual cost and time to design, procure, and construct each project (if complete) including all milestones.

Response to Sandy River Solar Data Request No. 015:

In addition to the general objections stated above, PGE objects to Sandy River Solar's Data Request No. 015 and each of its sub-parts on the grounds that they are vague, ambiguous, unintelligible, overbroad, unduly burdensome, seek irrelevant information, and/or seek information whose probative value is substantially outweighed by a danger of unfair prejudice, confusing the issues, subjecting PGE to undue burden, or needlessly presenting cumulative evidence. PGE further objects to Data Request No. 015 to the extent it seeks to compel PGE to develop information for Sandy River Solar. Notwithstanding and without waiving PGE's general objections or these specific objections, PGE responds to each sub-part of Complainant's Data Request No. 015 as follows:

PGE objects to the request that PGE assemble the requested information for every interconnection application of 3 MW or less submitted since January 2015. PGE estimates that there are approximately 183 such requests and that it would take PGE at least two months to develop the requested information. Such information is overbroad, unduly burdensome, irrelevant, or the probative value of the information is substantially outweighed by a danger of unfair prejudice, confusing the issues, subjecting PGE to undue burden, or needlessly presenting cumulative evidence. In response to Sandy River Data Request No. 015, PGE has provided the requested information with regard to the three interconnection requests on the same feeder as the Sandy River Solar Project that have resulted in any study results: SPQ0010, SPQ0051, and SPQ0070.

SPQ0010

a. The nameplate capacity of the solar facility;

- 2.2 MW$_{AC}$

b. The requirements for that interconnection;

(From the Interconnection Agreement)

- Design and construct a new 12.47 kV 3-phase, 4-wire distribution service to site including a primary metering point.
- Replace feeder relay panel and install a VT to achieve hot-line blocking protection scheme.

c. The length of time PGE required to complete each study;

- Feasibility Study - N/A
- System Impact Study – 41 Business Days
- Facilities Study – 108 Business Days

d. The cost estimates in each study;

- Feasibility Study -N/A
- System Impact Study - $85,000
- Facilities Study - $108,000

e. The timeline estimates to design, procure, and construct detailed in each study including all milestones;

- Feasibility Study - N/A
- System Impact Study - 12 Months
- Facilities Study - 12 Months

f. The actual cost and time to design, procure, and construct each project (if complete) including all milestones.

SPQ0010 is not complete.

SPQ0051:

a. The nameplate capacity of the solar facility;

- 2.0 MW$_{AC}$

b. The requirements for that interconnection;

(From the System Impact Study)

- Replace one set of hydraulic reclosers and an additional new set of reclosers on the Dunns Corner-13 feeder. Both sets of reclosers will be new electronic versions which can accommodate the two-way flow of power.
- In order to properly service the generation facility, the installation of a new primary service and metering package will also be needed.
- Replace existing transformer relay panels with two SEL-487E relay panels.

- Install transfer trip communication via SEL Mirror Bits including a fiber optic cable from the Dunns Corner Substation to the point of interconnection.

c. *The length of time PGE required to complete each study;*
- Feasibility Study - N/A
- System Impact Study – 43 Business Days
- Facilities Study – Project Withdrew

d. *The cost estimates in each study;*
- Feasibility Study - N/A
- System Impact Study - $638,500.00
- Facilities Study – Project Withdrew

e. *The timeline estimates to design, procure, and construct detailed in each study including all milestones;*
- Feasibility Study - N/A
- System Impact Study - 18 months
- Facilities Study – Project Withdrew

f. *The actual cost and time to design, procure, and construct each project (if complete) including all milestones.*
N/A

SPQ0070:

a. *The nameplate capacity of the solar facility;*
- 1.85 MWAC

b. *The requirements for that interconnection;*
(From the Interconnection Agreement)
- Install new primary service and metering package.
- Install as set of SEL-487E relay panels.
- Install transfer trip communication via SEL Mirror Bits including a fiber optic cable from the Dunns Corner Substation to the point of interconnection.

c. *The length of time PGE required to complete each study;*
- Feasibility Study - N/A
- System Impact System – 99 Business Days
- Facilities Study – 60 Business Days

d. *The cost estimates in each study;*
- Feasibility Study - N/A
- System Impact Study - $200,000.00
- Facilities Study - $243,000.00

e. *The timeline estimates to design, procure, and construct detailed in each study including all milestones;*

- Feasibility Study - N/A
- System Impact Study - 16 months
- Facilities Study - 18 months

Proposed Schedule	
Executed Interconnection Agreement	May 17, 2018
Interconnection Customer provides 1/3 of Estimated Cost	May 17, 2018
Engineering Design Starts	June 18, 2018
Interconnection Customer Provides Balance of Estimated Cost	November 16, 2018
Engineering Design Complete	December 17, 2018
PGE Construction Scheduled	January 18, 2019
Interconnection Customer Switchgear Installed/Inspected	September 16, 2019
Interconnection Facilities Complete	October 18, 2019
In-Service Date	November 15, 2019

f. *The actual cost and time to design, procure, and construct each project (if complete) including all milestones*.
SPQ0070 is not complete.

Sandy River Solar Data Request No. 016:

Please provide the names, contact information, and service address for all PGE staff that have worked on Sandy River Solar's interconnection.

Response to Sandy River Solar Data Request No. 016:

In addition to the general objections stated above, PGE objects to Sandy River Solar's Data Request No. 016 on the grounds it is vague, ambiguous, unintelligible, overbroad, unduly burdensome, seek irrelevant information, and/or seeks information whose probative value is substantially outweighed by a danger of unfair prejudice, confusing the issues, subjecting PGE to undue burden, or needlessly presenting cumulative evidence. Notwithstanding and without waiving PGE's general objections or these specific objections, PGE responds to each sub-part of Complainant's Data Request No. 016 as follows:

The names of the PGE staff that have worked on the Sandy River Solar interconnection request are:

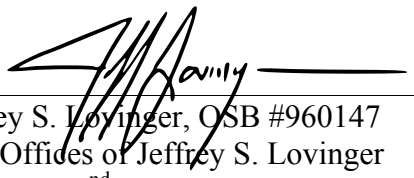
Jason Zappe
Nikee Weber
Janette Sandberg
Frederick Harris
James Vondenkamp
Daniel Syverson
Drazen Galic

Contact with this staff or any other PGE employee regarding this contested case proceeding should be made through PGE counsel listed in PGE's Answer. The service address for PGE is:

121 SW Salmon Street
1 WTC 1301
Portland, Oregon 97204

Dated this 7th day of December 2018.

By,



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Portland General Electric

System Impact Study

Interconnection Request:

[redacted] – 2.2 MWAC

SPQ0010

May 22, 2017

Table of Contents

1. Introduction

On April 20, 2016, Portland General Electric (PGE) received a completed Small Generator Interconnection Request. The Interconnection Request seeks to interconnect a 2.2 MWAC solar facility located in Clackamas County, Oregon at GPS coordinates [redacted]. The interconnection point will be on PGE's Dunns Corner-13 distribution feeder connected to the Dunns Corner substation.

As set forth in the Oregon Administrative Rules 860-082-0085(29), PGE has assigned queue number SPQ0010 to the Interconnection Request.

On March 24, 2017, PGE received an executed System Impact Study Agreement with the appropriate deposit from the Interconnection Customer.

The System Impact Study provides the study results based on the information provided in the Interconnection Request.

The Interconnection Customer will operate this generator as a Qualify Facility as defined by the Public Utility Regulatory Policies Act of 1978 (PURPA).

2. System Impact Study Scope

The primary purpose of the System Impact Study is to identify and detail the impacts of the Interconnection Request at the designated Point of Interconnection. PGE will also identify any required system additions necessary to accommodate the request. The study normally consists of the following:

- Documentation of any impacts observed in meeting the NERC/WECC System Performance Criteria that are adverse to the reliability of the electric system as a result of the interconnection.
- Documentation of other providers' to the transmission or distribution systems that are impacted, and identification of these providers as Affected Systems. Note, no Affected Systems were identified for this study.
- Documentation of fault interrupting equipment with short circuit capability limits that are exceeded as a result of the interconnection.
- A short circuit analysis and power flow analysis.
- Protection and set point coordination studies.
- Voltage drop, flicker and grounding reviews.

- A list of facility additions and upgrades which the applicable power flow, and short circuit analyses determine to be required to accommodate the interconnection.
- A non-binding, good faith estimate of cost responsibilities for making the required additions and system upgrades necessary to accommodate the interconnection.
- A non-binding, good faith estimate of the time to construct the required additions and system upgrades necessary to accommodate the request.

The System Impact Study considers all generating facilities that, on the date the study was commenced: (i) were directly interconnected to PGE's Distribution System; (ii) were interconnect to Affected Systems and may have an impact on the Interconnection Request; (iii) generating facilities having a pending higher queued Interconnection Request to interconnect to the Distribution System.

3. System Impact Study Assumptions

The System Impact Study considerations include the following assumptions for system conditions for all stages and seasons:

- Generating Facilities and identified PGE electrical system upgrades associated with higher queued Interconnection Requests.
- [redacted] was modeled at its maximum capability of 2.2 MW$_{AC}$.
- The Point of Interconnection will be on PGE's Dunns Corner-13 distribution feeder.
- The nominal voltage level at the Point of Interconnection will be 13 kV.
- The Interconnection Customer will design, permit, build and maintain all facilities on the customer's side of the Point of Interconnection.
- Line reconductor or fiber underbuild required on existing poles will be assumed to follow the most direct path on the Distribution System. If during detailed design the path must be modified it may result in additional cost and timing delays for the Interconnection Customer.
- Generator tripping may be required under certain outages.
- The Generating Facility is expected to operate during daylight hours every day 7 days a week 12 months per year. The Point of Interconnection power factor range studied was unity power factor or 1.0 as identified by the Interconnection Customer's Small Generator Interconnection Request.
- The interconnection was studied with one (1) SMA Sunny Central SC-2200 US inverter with reactive power capabilities as shown in the provided Small Generator Interconnection Request.
- This report is based on information available at the time of the study.

4. System Impact Study Interconnection Requirements

The Interconnection Request was studied such that 100% of the output of the Generation Facility can be delivered to PGE's Distribution System without displacement of existing or higher queued Interconnection Requests.

Distribution System Modifications

- The installation of a new distribution service and primary meter.

Protection Requirements

- Replace Relay panel
- Install VT

5. Cost Estimate

The following estimate represents only the scopes of work that will be performed by the Distribution Provider. Costs for any work being performed by the Interconnection Customer are not included.

Distribution Modifications New service and primary meter		$35,000.00
Protection Requirements Relay panel replacement and VT installation		$50,000.00
	Total	$85,000.00

6. Schedule

PGE estimates it will require approximately 12 months to design, procure and construct the facilities described in this report following the execution of an Interconnection Agreement. The schedule will be further developed and optimized during the Facility Study.

7. Appendix A

All active higher queued generation Interconnection Requests will be considered in this study and are identified below. If any of these requests are withdrawn, the PGE reserves the right to restudy the request, as the results and conclusions contained within the study could significantly change.

Currently there are no higher queued Interconnection Requests on Dunns Corner-13 feeder.

Portland General Electric

Facility Study

Interconnection Request:

[redacted] – 2.2 MWAC

SPQ0010

November 30, 2017

Table of Contents

1. Introduction

On April 20, 2016, Portland General Electric (PGE) received a completed Small Generator Interconnection Request for [redacted] The Interconnection Request seeks to interconnect a 2.2 MWAC solar facility located in Clackamas County, Oregon at GPS coordinates [redacted] The interconnection point will be on PGE's Dunns Corner-13 distribution feeder connected to the Dunns Corner substation.

As set forth in the Oregon Administrative Rules 860-082-0085(29), PGE has assigned queue number SPQ0010 to the Interconnection Request.

On June 26, 2017, PGE received an executed Facility Study Agreement with the appropriate deposit from the Interconnection Customer.

The Facility Study provides the study results based on the information provided in the Interconnection Request.

The Interconnection Customer will operate this generator as a Qualify Facility as defined by the Public Utility Regulatory Policies Act of 1978 (PURPA).

2. Facility Study Scope

The primary purpose of the Facility Study is to provide a preliminary project scope and cost estimates for the necessary infrastructure modifications to serve a new 2.2 MWAC generation facility. PGE in the System Impact Study reviewed and provided the following:

- Documentation of any impacts observed in meeting the NERC/WECC System.
- A list of facility additions and upgrades which the applicable power flow, and short circuit analyses determine to be required to accommodate the interconnection.
- A non-binding, good faith estimate of cost responsibilities for making the required additions and system upgrades necessary to accommodate the interconnection.
- A non-binding, good faith estimate of the time to construct the required additions and system upgrades necessary to accommodate the request.

The Facility Study report identifies any additional Interconnection Requirements and provides a preliminary cost estimate.

3. Facility Study Assumptions

The Facility Study considerations include the following assumptions:

- The 2.2 MW$_{AC}$ generator is assumed to be the peak output. The generation is assumed to be summer peaking.
- The Point of Interconnection will be on PGE's Dunns Corner-13 distribution feeder.
- Delivery is assumed to be at 12.47 kV.
- The Interconnection Customer will design, permit, build and maintain all facilities on the Interconnection Customer's side of the Point of Interconnection.
- Line re-conductor or fiber underbuild required on existing poles will be assumed to follow the most direct path on the Distribution System.
- The load characteristics of the electrical equipment during starting and operation will not have a negative impact on the quality of service to PGE's customers in the Sandy area.
- The Interconnection Customer will acquire all necessary property rights and permits for the construction of the required facilities as well as distribution line easements (meeting PGE requirements), including easements for PGE's owned underground cable route for the new service.
- No Affected Systems were identified by this study.
- This report is based on information available at the time of the study.

4. Facility Study Overview

The System Impact Study identified the following Interconnection Requirements.

- Install a new primary service including a bi-direction meter, CT's and PT's.
- Install a feeder VT for hot-line blocking.
- Replace the feeder relay panel.

The Facility Study has affirmed the requirements contained within the System Impact Study and the scope of work detailed below outlines the responsibilities of both PGE and the Interconnection Customer.

PGE's Responsibilities

PGE will design, procure, install and maintain the new service conductor and metering equipment. However the conduit and trench from the Point of Interconnection to the riser pole will be installed by the Interconnection Customer.

At the Dunns Corner Substation on the Dunns Corner-13 feeder PGE will design, install and maintain a new feeder VT and replace the relay panel.

Interconnection Customers Responsibilities

For the new service the Interconnection Customer will need to trench and install 4" conduit from the Point of Interconnection to the riser pole in accordance with PGE's standards. Additionally a pull rope will need to be placed in the conduit to allow PGE to pull in the new service conductors.

The Interconnection Customer will also be responsible for the installation of the CT's. The CT's will be provided by PGE and wired by PGE after they have been installed.

The Interconnection Customer will acquire all necessary property rights and permits for the construction of the required facilities as well as distribution line easements (meeting PGE requirements), including easements for PGE's owned underground cable route for the new service.

5. Cost Estimate

The following estimate represents PGE's good faith, non-binding estimate in accordance with OAR 860-082-0035. The estimate is only for the scopes of work that will be performed by the PGE. Costs for any work being performed by the Interconnection Customer or for any Interconnection Customer-owned, supplied and installed equipment and associated design and engineering are not included.

Distribution Modifications		$35,000.00
Protection Requirements		$68,000.00
	Total	$103,000.00

6. Schedule

PGE estimates it will require approximately 12 months to design, procure and construct the facilities described in this report following the execution of an Interconnection Agreement. PGE does not guarantee completion of any project on a targeted date as the

schedule is dependent on a number of variables, including but not limited to, construction of other potential interconnection projects.

7. Confirmation to Proceed

Please confirm your agreement to pay for the interconnection facilities and system upgrades identified in this Facilities Study within fifteen (15) business days of PGE's issuance of this Facilities Study by signing the below page and sending a copy by e-mail to jason.zappe@pgn.com. PGE will approve your Application and provide you with an executable Interconnection Agreement within five (5) business days from PGE's receipt of that approval.

In any event, PGE will issue an executable Interconnection Agreement within twenty (20) business days of PGE's issuance of this Facilities Study.

Signature: _____

Printed Name: _____

Title (*if any*): _____

Date: _____

Portland General Electric

System Impact Study

Interconnection Request:

[redacted] – 2 MWAC

SPQ0051

December 22, 2017

Table of Contents

1. Introduction

On October 10, 2017, Portland General Electric (PGE) received a completed Small Generator Interconnection Request. The Interconnection Request seeks to interconnect a 2 MWAC solar facility located in Clackamas County, Oregon at GPS coordinates [redacted]. The interconnection point will be on PGE's Dunns Corner-13 distribution feeder connected to the Dunns Corner substation.

As set forth in the Oregon Administrative Rules 860-082-0085(29), PGE has assigned queue number SPQ0051 to the Interconnection Request.

On October 20, 2017, PGE received an executed System Impact Study Agreement with the appropriate deposit from the Interconnection Customer.

The System Impact Study provides the study results based on the information provided in the Interconnection Request.

The Interconnection Customer will operate this generator as a Qualify Facility as defined by the Public Utility Regulatory Policies Act of 1978 (PURPA).

2. System Impact Study Scope

The primary purpose of the System Impact Study is to identify and detail the impacts of the Interconnection Request at the designated Point of Interconnection. PGE will also identify any required system additions necessary to accommodate the request. The study normally consists of the following:

- Documentation of any impacts observed in meeting the NERC/WECC System Performance Criteria that are adverse to the reliability of the electric system as a result of the interconnection.
- Documentation of other providers' to the transmission or distribution systems that are impacted, and identification of these providers as Affected Systems. Note, no Affected Systems were identified for this study.
- Documentation of fault interrupting equipment with short circuit capability limits that are exceeded as a result of the interconnection.
- A short circuit analysis and power flow analysis.
- Protection and set point coordination studies.
- Voltage drop, flicker and grounding reviews.

- A list of facility additions and upgrades which the applicable power flow, and short circuit analyses determine to be required to accommodate the interconnection.
- A non-binding, good faith estimate of cost responsibilities for making the required additions and system upgrades necessary to accommodate the interconnection.
- A non-binding, good faith estimate of the time to construct the required additions and system upgrades necessary to accommodate the request.

The System Impact Study considers all generating facilities that, on the date the study was commenced: (i) were directly interconnected to PGE's Distribution System; (ii) were interconnect to Affected Systems and may have an impact on the Interconnection Request; (iii) generating facilities having a pending higher queued Interconnection Request to interconnect to the Distribution System.

3. System Impact Study Assumptions

The System Impact Study considerations include the following assumptions for system conditions for all stages and seasons:

- Generating Facilities and identified PGE electrical system upgrades associated with higher queued Interconnection Requests.
- [redacted] was modeled at its maximum capability of 2 MWAC.
- The Point of Interconnection will be on PGE's Dunns Corner-13 distribution feeder.
- The nominal voltage level at the Point of Interconnection will be 13 kV.
- The Interconnection Customer will design, permit, build and maintain all facilities on the customer's side of the Point of Interconnection.
- Line reconductor or fiber underbuild required on existing poles will be assumed to follow the most direct path on the Distribution System. If during detailed design the path must be modified it may result in additional cost and timing delays for the Interconnection Customer.
- Generator tripping may be required under certain outages.
- The Generating Facility is expected to operate during daylight hours every day 7 days a week 12 months per year. The Point of Interconnection power factor range studied was unity power factor or 1.0 as identified by the Interconnection Customer's Small Generator Interconnection Request.
- The interconnection was studied with sixteen (16) SunGrow SG125HV 2 MWAC inverters with reactive power capabilities as shown in the provided Small Generator Interconnection Request.
- This report is based on information available at the time of the study.

4. Affected Systems

All active higher queued generation Interconnection Requests were considered in this study and are identified below. If any of these requests are withdrawn, then PGE reserves the right to restudy the request, as the results and conclusions contained within the study could significantly change.

One higher queued Interconnection Requests were identified on Dunns Corner-13 feeder.

SPQ0010 – Clackamas – 2.2 MWAC

5. System Impact Study Interconnection Requirements

The Interconnection Request was studied such that 100% of the output of the Generation Facility can be delivered to PGE's Distribution System without displacement of existing or higher queued Interconnection Requests.

An analysis of the Dunns Corner-13 distribution system and the Dunns Corner Substation was performed to determine potential voltage and loading conditions which may arise from the addition of the [redacted] project. The following requirements were identified to mitigate adverse conditions observed during the analysis.

Distribution System Modifications

The analysis showed the interconnection of [redacted] would require the replacement of one set of hydraulic reclosers and the addition of a new set of reclosers on the Dunns Corner-13 feeder. Both sets of reclosers will be new electronic versions which can accommodate the two way flow of power.

In order to properly service the generation facility the installation of a new primary service and metering package will also be needed.

Protection Requirements

The proposed generation will exceed the daytime minimum loading of the Dunns Corner BR1 substation transformer and necessitate the upgrade of the transformer relay panels. The existing relay panels will be replaced with two SEL-487E relay panels.

The solar project will also exceed the daytime minimum loading of the Dunns Corner-13 feeder. When generation exceeds the daytime minimum load a transfer trip protective

scheme will also be required. Transfer trip communication will be needed between the substation and the Generation Facility. PGE's preferred method for transfer trip communication is Schweitzer Mirror Bit protocol.

6. Cost Estimate

The following estimate represents only the scopes of work that will be performed by the Distribution Provider. Costs for any work being performed by the Interconnection Customer are not included.

Distribution Modifications		$150,000.00
New Primary Service		$35,000.00
Substation Modifications		$158,000.00
Communications		$295,500.00
	Total	$638,500.00

7. Schedule

PGE estimates it will require approximately 18 months to design, procure and construct the facilities described in this report following the execution of an Interconnection Agreement. The schedule will be further developed and optimized during the Facility Study.

Portland General Electric

System Impact Study

Interconnection Request:

[redacted] – 1.85 MWAC

SPQ0070

January 7, 2018

Table of Contents

1. Introduction

On June 1, 2017, Portland General Electric (PGE) received a completed Small Generator Interconnection Request for [redacted] The Interconnection Request seeks to interconnect a 1.85 MWAC solar facility located in Clackamas County, Oregon at GPS coordinates [redacted] The interconnection point will be on PGE's Dunns Corner-13 distribution feeder connected to the Dunns Corner substation.

As set forth in the Oregon Administrative Rules 860-082-0085(29), PGE has assigned queue number SPQ0070 to the Interconnection Request.

On August 3, 2017, PGE received an executed System Impact Study Agreement with the appropriate deposit from the Interconnection Customer.

The System Impact Study provides the study results based on the information provided in the Interconnection Request.

The Interconnection Customer will operate this generator as a Qualify Facility as defined by the Public Utility Regulatory Policies Act of 1978 (PURPA).

2. System Impact Study Scope

The primary purpose of the System Impact Study is to identify and detail the impacts of the Interconnection Request at the designated Point of Interconnection. PGE will also identify any required system additions necessary to accommodate the request. The study normally consists of the following:

- Documentation of any impacts observed in meeting the NERC/WECC System Performance Criteria that are adverse to the reliability of the electric system as a result of the interconnection.
- Documentation of other providers' to the transmission or distribution systems that are impacted, and identification of these providers as Affected Systems. Note, no Affected Systems were identified for this study.
- Documentation of fault interrupting equipment with short circuit capability limits that are exceeded as a result of the interconnection.
- A short circuit analysis and power flow analysis.
- Protection and set point coordination studies.
- Voltage drop, flicker and grounding reviews.

- A list of facility additions and upgrades which the applicable power flow, and short circuit analyses determine to be required to accommodate the interconnection.
- A non-binding, good faith estimate of cost responsibilities for making the required additions and system upgrades necessary to accommodate the interconnection.
- A non-binding, good faith estimate of the time to construct the required additions and system upgrades necessary to accommodate the request.

The System Impact Study considers all generating facilities that, on the date the study was commenced: (i) were directly interconnected to PGE's Distribution System; (ii) were interconnect to Affected Systems and may have an impact on the Interconnection Request; (iii) generating facilities having a pending higher queued Interconnection Request to interconnect to the Distribution System.

3. System Impact Study Assumptions

The System Impact Study considerations include the following assumptions for system conditions for all stages and seasons:

- Generating Facilities and identified PGE electrical system upgrades associated with higher queued Interconnection Requests.
- [redacted] was modeled at its maximum capability of 1.85 MWAC.
- The Point of Interconnection will be on PGE's Dunns Corner-13 distribution feeder.
- The nominal voltage level at the Point of Interconnection will be 13 kV.
- The Interconnection Customer will design, permit, build and maintain all facilities on the customer's side of the Point of Interconnection.
- Line reconductor or fiber underbuild required on existing poles will be assumed to follow the most direct path on the Distribution System. If during detailed design the path must be modified it may result in additional cost and timing delays for the Interconnection Customer.
- Generator tripping may be required under certain outages.
- The Generating Facility is expected to operate during daylight hours every day 7 days a week 12 months per year. The Point of Interconnection power factor range studied was unity power factor or 1.0 as identified by the Interconnection Customer's Small Generator Interconnection Request.
- The interconnection was studied with two (2) SMA Sunny Central 500CP-US and one (1) SMA Sunny Central 850CP-US inverters with reactive power capabilities as shown in the provided Small Generator Interconnection Request.
- This report is based on information available at the time of the study.

4. Affected Systems

All active higher queued generation Interconnection Requests were considered in this study and are identified below. If any of these requests are withdrawn, then PGE reserves the right to restudy the request, as the results and conclusions contained within the study could significantly change.

Two higher queued Interconnection Requests were identified on Dunns Corner-13 feeder.

SPQ0010 – Clackamas – 2.2 MWAC
SPQ0051 – Clackamas – 2.0 MWAC

5. System Impact Study Interconnection Requirements

The Interconnection Request was studied such that 100% of the output of the Generation Facility can be delivered to PGE's Distribution System without displacement of existing or higher queued Interconnection Requests.

An analysis of the Dunns Corner-13 distribution system and the Dunns Corner Substation was performed to determine potential voltage and loading conditions which may arise from the addition of the [redacted] project. The following requirements were identified to mitigate adverse conditions observed during the analysis.

Distribution System Modifications

The analysis showed the interconnection of [redacted] would require the replacement of one set of hydraulic reclosers on the Dunns Corner-13 feeder. Both sets of reclosers will be new electronic versions which can accommodate the two way flow of power.

In order to properly service the generation facility the installation of a new primary service and metering package will also be needed.

Protection Requirements

The proposed generation will exceed the daytime minimum loading of the Dunns Corner-13 feeder and the BR1 substation transformer and necessitate a transfer trip protection scheme. Transfer trip communication will be needed between the substation and the Generation Facility. PGE's preferred method for transfer trip communication is Schweitzer Mirror Bit protocol.

6. Cost Estimate

The following estimate represents only the scopes of work that will be performed by the Distribution Provider. Costs for any work being performed by the Interconnection Customer are not included.

Distribution Requirements		$90,000.00
Communications Requirements		$110,000.00
	Total	$200,000.00

7. Schedule

PGE estimates it will require approximately 16 months to design, procure and construct the facilities described in this report following the execution of an Interconnection Agreement. The schedule will be further developed and optimized during the Facility Study.

Portland General Electric

Facility Study

Interconnection Request:

[redacted] – 1.85 MWAC

SPQ0070

April 16, 2018

Table of Contents

1. Introduction

On May 23, 2017, Portland General Electric (PGE) received a completed Small Generator Interconnection Request for [redacted] The Interconnection Request seeks to interconnect a 1.85 MWAC solar facility located in Clackamas County, Oregon at GPS coordinates [redacted] The interconnection point will be on PGE's Dunns Corner-13 distribution feeder connected to the Dunns Corner substation.

As set forth in the Oregon Administrative Rules 860-082-0085(29), PGE has assigned queue number SPQ0070 to the Interconnection Request.

On January 12, 2017, PGE received an executed Facility Study Agreement with the appropriate deposit from the Interconnection Customer.

The Facility Study provides the study results based on the information provided in the Interconnection Request.

The Interconnection Customer will operate this generator as a Qualify Facility as defined by the Public Utility Regulatory Policies Act of 1978 (PURPA).

2. Facility Study Scope

The primary purpose of the Facility Study is to provide a preliminary project scope and cost estimates for the necessary infrastructure modifications to serve a new 1.85 MWAC generation facility. PGE in the System Impact Study reviewed and provided the following:

- Documentation of any impacts observed in meeting the NERC/WECC System
- A list of facility additions and upgrades which the applicable power flow, and short circuit analyses determine to be required to accommodate the interconnection.
- A non-binding, good faith estimate of cost responsibilities for making the required additions and system upgrades necessary to accommodate the interconnection.
- A non-binding, good faith estimate of the time to construct the required additions and system upgrades necessary to accommodate the request.

The Facility Study report will identify any additional Interconnection Requirements and provide a preliminary cost estimate.

3. Facility Study Assumptions

The Facility Study considerations include the following assumptions:

- The 1.85 MW$_{AC}$ generator is assumed to be the peak output. The generation is assumed to be summer peaking.
- The Point of Interconnection will be on PGE's Dunns Corner-13 distribution feeder.
- Delivery is assumed to be at 12.47 kV.
- The Interconnection Customer will design, permit, build and maintain all facilities on the customer's side of the Point of Interconnection.
- Line re-conductor or fiber underbuild required on existing poles will be assumed to follow the most direct path on the Distribution System.
- The load characteristics of the electrical equipment during starting and operation will not have a negative impact on the quality of service to PGE's customers in the Sandy area.
- The Interconnection Customer will acquire all necessary distribution line easements, including easements for PGE's owned underground cable route for the new service.
- No Affected Systems were identified by this study.
- This report is based on information available at the time of the study.

4. Facility Study Overview

The System Impact Study identified the following Interconnection Requirements.

- Install a new primary service including a bi-direction meter and CT's.
- Installation of a Transfer Trip protection scheme.

The Facility Study has affirmed the requirements listed above and has identified additional interconnection requirements. The additional interconnection requirements are listed below. The new requirements are due to the developer for SPQ0051 withdrawing the project from the interconnection queue.

The proposed generation from [redacted] will exceed the daytime minimum load of the Dunns Corner BR1 substation transformer. When this occurs PGE has to replace the substation transformer relays to allow for communication with the 57 kV VT. The VT is already in place but a set of SEL-487E relay panels will need to be installed.

The scope of work detailed below outlines the responsibilities of both PGE and the Interconnection Customer.

PGE's Responsibilities

PGE will design, procure, install and maintain the new service conductor and metering equipment. However the conduit and trench from the Point of Interconnection to the riser pole will be installed by the Interconnection Customer.

At the Dunns Corner Substation, PGE will design, install and maintain two SEL-487E relay panels along with the connection to the existing 57 kV VT.

A transfer trip protection scheme will be designed, installed and maintained by PGE.

Interconnection Customers Responsibilities

For the new service the Interconnection Customer will need to trench and install 4" conduit from the Point of Interconnection to the riser pole in accordance with PGE's standards. Additionally a pull rope will need to be placed in the conduit to allow PGE to pull in the new service conductors.

The Interconnection Customer will also be responsible for the installation of the CT's. The CT's will be provided by PGE and wired by PGE after they have been installed.

5. Cost Estimate

The following estimate represents PGE's good faith, non-binding estimate in accordance with OAR 860-082-0035. The estimate is only for the scopes of work that will be performed by the Distribution Provider. Costs for any work being performed by the Interconnection Customer are not included.

Distribution Modifications		$30,000.00
Protection Requirements		$148,000.00
Communication Requirements		$65,000.00
	Total	$243,000.00

6. Schedule

PGE estimates it will require approximately 18 months to design, procure and construct the facilities described in this report following the execution of an Interconnection Agreement.

Proposed Schedule

Executed Interconnection Agreement	May 17, 2018
Interconnection Customer provides 1/3 of Estimated Cost	May 17, 2018
Engineering Design Starts	June 18, 2018
Interconnection Customer Provides Balance of Estimated Cost	November 16, 2018
Engineering Design Complete	December 17, 2018
PGE Construction Scheduled	January 18, 2019
Interconnection Customer Switchgear Installed/Inspected	September 16, 2019
Interconnection Facilities Complete	October 18, 2019
In-Service Date	November 15, 2019

7. Confirmation to Proceed

Please confirm your agreement to pay for the interconnection facilities and system upgrades identified in the Facilities Study within fifteen (15) business days of PGE's issuance of the Facilities Study by signing the below page and sending a copy by e-mail to jason.zappe@pgn.com. PGE will approve your Application and provide you with an executable Interconnection Agreement within five (5) business days from PGE's receipt of that approval. In any event, PGE will issue an executable Interconnection Agreement within twenty (20) business days of PGE's issuance of the Facilities Study.

Signature: _____

Printed Name: _____

Title (*if any*): _____

Date: _____

PGE

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Attachment D

Scope of Work/Milestones

In-Service Date: December 31, 2018

Critical milestones and responsibility as agreed to by the Parties:

	Milestone/Date	Responsible Party
(1)	Executed Interconnection Agreement / 10-10-2017	SPQ0010
(2)	$35,000 of Estimated Cost / 1-31-2018	SPQ0010
(3)	Engineering Design Starts / 1-2-2018	PGE
(4)	Remaining Balance of $70,000 / 6-15-2018	SPQ0010
(5)	Engineering Design Complete / 8-31-2018	PGE
(6)	PGE Construction Scheduled / 9-28-2018	PGE
(7)	Switchgear Installed and Inspection / 11-30-2018	SPQ0010
(8)	Interconnection Facilities Complete / 12-21-2018	PGE
(9)	Testing and Commissioning / 12-28-2019	SPQ0010
(10)	In-Service Date / 12-31-2018	PGE

PGE does not guarantee completion of any project on a targeted date as the schedule is dependent on a number of variables, including but not limited to, construction of other potential interconnection projects.

Notwithstanding any other language in the Agreement, payment is due on the date specified above. Payments are due without prior notice or demand.

SPQ0070

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Attachment D

Scope of Work/Milestones

In-Service Date: February 17, 2020

Critical milestones and responsibility as agreed to by the Parties:

	Milestone/Date	Responsible Party
(1)	Executed Interconnection Agreement / 11-28-2018	SPQ0070
(2)	$10,000 of Estimated Cost / 11-28-2018	SPQ0070
(3)	Engineering Design Starts / 12-21-2018	PGE
(4)	$71,000 of Estimated Cost / 4-19-2019	SPQ0070
(5)	*Engineering Design Complete / 4-19-2019	PGE
(6)	PGE Construction Scheduled / 8-1-2019	PGE
(7)	Remaining Balance of $81,000 / 9-1-2019	SPQ0070
(8)	Switchgear Installed and Inspection / 12-16-2019	SPQ0070
(9)	Interconnection Facilities Complete / 1-17-2020	PGE
(10)	Testing and Commissioning / 2-3-2020	SPQ0070
(11)	In-Service Date / 2-17-2020	PGE

* During the design of the communication scheme additional costs or time may be incurred should the existing utility poles need to be replaced or modified to accommodate the fiber optic line.

PGE does not guarantee completion of any project on a targeted date as the schedule is dependent on a number of variables, including but not limited to, construction of other potential interconnection projects.