

**BEFORE THE PUBLIC UTILITY COMMISSION
OF OREGON**

UM 1631

In the Matter of

Marquam Creek Solar, LLC,

Petition for Waiver of OAR 860-082-0025(1)(c)

MARQUAM CREEK SOLAR, LLC'S
PETITION FOR WAIVER OF OAR 860-082-0025(1)(c)

I. INTRODUCTION AND SUMMARY

Marquam Creek Solar, LLC (“Marquam Creek Solar”) respectfully petitions the Public Utility Commission of Oregon (“OPUC” or “Commission”) to waive OAR 860-082-0025(1)(c) for its community solar facility. That rule ordinarily requires the interconnection customer to forfeit its queue position and submit a new application for interconnection when it makes any change to the nameplate capacity of its facility during the interconnection process. The Commission should grant a waiver of the rule in this case for several reasons.

First, the problem at hand arose due to no fault of Marquam Creek Solar, and a relatively minor reduction in nameplate capacity is a reasonable and simple solution. Marquam Creek Solar had already secured a fully executed Generator Interconnection Agreement (“GIA”) with Portland General Electric Company (“PGE”) for its community solar facility that contained an interconnection cost estimate of \$268,350, which would allow the facility to be brought into service. The problem arose only after PGE subsequently proposed to re-study the Marquam Creek Solar’s interconnection after a higher queued interconnection customer withdrew from the queue. As a result of the restudies, PGE asserts that Marquam Creek Solar’s generation will cause back-feeding onto PGE’s system that requires extensive and costly upgrades referred to as

“3V0 sensing,” with total estimated interconnection costs in PGE’s latest System Impact Study to be \$1,100,053. That amount is cost prohibitive for the small facility and will result in the development being abandoned. However, based on information supplied by PGE, a minor reduction of 88 kilowatts (“kW”) to Marquam Creek Solar’s initial nameplate capacity of 2,000 kW would eliminate PGE’s requirement for 3V0 sensing and bring the costs down to a reasonable and economically feasible level.

Second, although OAR 860-082-0025(1)(c) provides interconnection customers no express right to reduce nameplate capacity during the interconnection process, interconnection procedures throughout the country commonly allow for much more significant changes to the nameplate capacity than that requested here. Those rules recognize that the study process is an iterative process where the customer should be allowed to make changes responsive to the findings of the studies, such as the proposed change here that would “right size” the community solar facility for the distribution system without triggering cost-prohibitive upgrades. Indeed, both PGE and PacifiCorp have previously agreed to allow reductions to interconnection capacity without loss of queue position and without seeking a waiver of the applicable Division 82 rule.

Third, the requested reduction is consistent with the Commission’s rules governing its community solar queue, which allow for reductions in capacity of up to 200 kW without loss of queue position. Such treatment recognizes the need to adjust the nameplate capacity of the facility during the development process and encourages the success of community solar program, but that right is useless without corresponding changes to the interconnection capacity.

Accordingly, the Commission should grant Marquam Creek Solar’s request to waive OAR 860-082-0025(1)(c).

II. FACTUAL BACKGROUND

Marquam Creek Solar is a planned community solar facility that is under development to be interconnected on PGE's Scotts-Mills-13 feeder in Clackamas County, Oregon. Marquam Creek Solar was initially planned to be developed as a qualifying facility but subsequently determined it would be developed as a community solar facility. PGE agreed to terminate a previously executed power purchase agreement to sell as a qualifying facility.¹ But due to uncertainties surrounding its interconnection, Marquam Creek Solar was unable to timely enroll in PGE's community solar interconnection queue and it retains its position in the traditional small generator queue, which it intends to use to interconnect the facility as a community solar facility. Unfortunately, the major impediment to development of this community solar facility is PGE's currently proposed interconnection costs, which in the past year have increased over fourfold from those contained in Marquam Creek Solar's fully executed GIA.

Marquam Creek Solar applied for interconnection service from PGE on July 24, 2017, and it progressed through the Division 82 interconnection process as queue position SPQ0093 to ultimately execute its GIA with PGE on October 23, 2018.² The executed GIA calls for new primary service including a bi-directional meter and CTs, replacement of certain fuses, and installation of transfer trip protection scheme via fiber optic cable. The total cost estimate for PGE's equipment and work is \$268,350, and the GIA does not state that these costs are contingent upon completion of any higher queued interconnection facilities.³ The milestones in the GIA forecasted an 18-month construction schedule under which Marquam Creek Solar could

¹ PGE's Supplemental Filing of Advice No. 20-09, Schedule 136 Oregon Community Solar Program Cost Recovery Mechanism Update, at Attachment A, Settlement Agreement (May 15, 2020).

² Marquam Creek Solar's GIA is attached as Exhibit 1.

³ *Id.* at Attachment A.

have been placed in service on February 28, 2020.⁴

However, after the GIA was executed, PGE informed Marquam Creek Solar that it would be subjected to re-study. On January 11, 2019, PGE communicated to Marquam Creek Solar that, due to withdraw of a higher queued interconnection customer, Marquam Creek Solar must submit a new \$1,000 deposit to pay PGE to conduct a new system impact study.⁵ PGE stated that during the re-study process the GIA's milestones would be paused.⁶ After Marquam Creek Solar submitted the new deposit and study agreement, PGE completed a re-study of the system impact study on April 26, 2019.⁷ In that study the interconnection costs had jumped to \$348,013, and the construction schedule became 24 months.⁸ PGE also conducted a re-study of the Facilities Study, dated August 13, 2019, which erroneously included extensive new costs to reconductor a distribution line that caused the costs to jump yet again to \$895,937.00, with a 16-month construction schedule.⁹

But then PGE determined in September 2019 that yet another system impact re-study must be conducted due to another higher queued interconnection customer dropping out of the queue.¹⁰ Ultimately, PGE completed another system impact re-study, dated January 21, 2020.

⁴ *Id.* at Attachment D.

⁵ PGE's email dated January 11, 2019 is attached as Exhibit 2.

⁶ *Id.*

⁷ PGE's re-study of the System Impact Study dated April 26, 2019, is attached as Exhibit 3.

⁸ *Id.* at p. 6.

⁹ PGE's re-study of the Facilities Study dated August 13, 2019, is attached as Exhibit 4. This re-study concluded that because SPQ0074 withdrew, there was 2.7 miles of reconductoring that would now fall on Marquam Creek Solar (SPQ0093), which presumably made up the majority of the \$593,500 cost itemized in the study for "Distribution Modifications." *Id.* at pp. 4, 6. But the requirement for Marquam Creek Solar to pay for 2.7 miles of reconductoring was erroneous because SPQ0074 was southeast of the Scotts Mills substation, and Marquam Creek Solar is northeast of the substation. This reconductoring requirement is not included in the subsequent re-study, and it does not appear to be an issue that remains in dispute – even though it does call into question the reliability of PGE's interconnection studies.

¹⁰ PGE communicated it would conduct the re-study in its emails dated September 10, 2019, and October 17, 2019, which are attached as Exhibit 5.

In that re-study, the costly reconductor of 2.7 miles of distribution line erroneously included in the prior re-study of the Facilities Study was eliminated, but the estimate of Marquam Creek Solar’s interconnection costs nevertheless ballooned to \$1,100,053, with a 24-month construction schedule.¹¹

Most significantly, the new system impact study forecasted that Marquam Creek Solar would cause the generation on the Scotts Mills-13 feeder to exceed daytime minimum load on the feeder, thus triggering PGE to require extensive and costly upgrades for protective equipment.¹² According to PGE, due to Marquam Creek Solar causing generation to potentially exceed the daytime minimum load, the “generation can carry the entire Scotts Mills substation transformer load and will cause backflow into the transmission system.”¹³ PGE proposed to address this concern with extensive protection and transfer tripping equipment referred to as “3V0 sensing or as 59N protection”¹⁴ – a method of addressing back feed that has evolved since Marquam Creek Solar entered the interconnection queue and appears from older studies to be a far more expensive solution than PGE utilized just a few years ago.¹⁵

Marquam Creek Solar had serious concerns with the analysis in PGE’s various studies and therefore engaged in extensive discussions with PGE to attempt to avoid being subjected to unnecessary and cost-prohibitive interconnection facilities. PGE and Marquam Creek Solar continue to disagree on many issues, including PGE’s analysis for determining when 3V0 sensing is properly required, which, in effect double counts net metering generation on the feeder by counting net metering as generation on the feeder without also accounting for the reduction in

¹¹ PGE’s re-study of the system impact study dated January 21, 2020, is attached as Exhibit 6.

¹² *Id.* at pp. 5-6.

¹³ *Id.*

¹⁴ *Id.*

¹⁵ For a discussion of PGE’s evolving standards on this point, *see Staff Report*, Docket No. UM 2099, at 3 (Oct. 26, 2020).

load on the feeder during daytime hours caused by net metering. Marquam Creek Solar has also expressed concern that it appears that PGE allowed several net metering facilities to advance ahead of Marquam Creek Solar in the interconnection queue, which may have pushed Marquam Creek Solar to be over PGE's current threshold for triggering 3V0 sensing requirements. Ultimately, Marquam Creek Solar and PGE were unable to reach mutually agreeable resolution of those issues, and Marquam Creek Solar reserves the right to later bring a complaint against PGE for violations of the Commission's interconnection rules and Marquam Creek Solar's executed GIA if this Petition is not granted.

However, for purposes of this Petition, Marquam Creek Solar has identified a solution to its interconnection problems that would avoid extensive litigation before the Commission or other tribunals. Specifically, if its facility could avoid causing PGE to conclude generation will exceed daytime minimum load on the feeder, the new and costly protective equipment for 3V0 sensing would be unnecessary. Instead, bringing Marquam Creek Solar's capacity to level that keeps PGE's calculation of generation on the feeder just below PGE's calculation of the daytime minimum load would result in a requirement for "hotline blocking" protection, which is substantially less expensive than 3V0 sensing and would allow Marquam Creek Solar to move forward with the development under the current GIA.¹⁶ Hotline blocking is the protective scheme PGE formerly used at the time Marquam Creek Solar entered the interconnection queue to address the circumstance when an interconnection customer caused generation to exceed load on a feeder before it adopted 3V0 sensing requirements in the past few years.¹⁷

¹⁶ See *Staff Report*, Docket No. UM 2099, at 3 (Oct. 26, 2020) (noting that PGE uses hotline blocking if the generation on the feeder is within 90% and 100% of the feeder's daytime minimum load and uses 3V0 sensing if generation exceeds 100% of daytime minimum load).

¹⁷ PGE discussed the development of its new and more costly interconnection requirements for generators that cause the feeder's generation to exceed load in PGE's letter dated December 7, 2020, which is attached as Exhibit 7.

PGE’s most recent analysis on the subject for Marquam Creek Solar is contained in a letter dated December 7, 2020.¹⁸ PGE currently calculates the daytime minimum load on the relevant transformer to be 2.105 megawatts (“MW”).¹⁹ PGE calculates that with Marquam Creek Solar sized at 2.0 MW, the “aggregate generation” capacity on the transformer would be 2.193 MW²⁰ – thus exceeding the daytime minimum load by only 88 kW. This 88 kW of excess aggregate generation triggers the need for 3V0 sensing and associated protective equipment that make the interconnection cost prohibitive.

Thus, Marquam Creek Solar proposed that PGE agree to allow it to reduce its nameplate capacity by 88 kW or such other reasonable amount PGE deems necessary to avoid aggregate generation on the feeder exceeding daytime minimum load.²¹ Marquam Creek Solar’s request was made before the commencement of the Facilities Study process in PGE’s re-study, and Marquam Creek Solar requested that PGE include the revised capacity in the forthcoming Facilities Study.²² However, PGE declined to agree to allow Marquam Creek Solar to reduce its capacity, and further refused to even hold the Facilities Study process in abeyance until this Petition could be resolved by the Commission, asserting that a lower queued interconnection customer would be harmed by allowing Marquam Creek Solar to make any change to its capacity.²³

¹⁸ PGE’s letter dated December 7, 2020, is attached as Exhibit 7.

¹⁹ *Id.* at pp. 2-3.

²⁰ *Id.*

²¹ *See* Marquam Creek Solar’s letter to PGE dated December 11, 2020, which is attached as Exhibit 8.

²² *Id.* at p. 3.

²³ *See* PGE’s letter dated December 17, 2020, and email dated January 15, 2021, which are attached as Exhibit 9.

III. LEGAL STANDARD

The Commission may waive the application of any of the Small Generator Interconnection Rules in Division 82.²⁴ Specifically, OAR 860-082-0010 states, “[u]pon request or its own motion, the Commission may waive any of the Division 082 rules for good cause shown. A request for waiver must be made in writing, unless otherwise allowed by the Commission.”²⁵ Further, the Commission has explained that “a person seeking waiver of any rule . . . must establish a sufficient reason for the waiver, and that the Commission will only grant the request if waiver of the rule is in the public interest.”²⁶ If granted, a “waiver is not intended to modify a rule’s application on a prospective basis; rather, it seeks a variance from that rule to address unusual circumstances or those not anticipated when the rules were adopted.”²⁷ Notably, the Commission adopted the general waiver provision applicable here with the express intent “to more efficiently regulate utilities under conditions of rapidly changing environments and technologies and under extenuating circumstances.”²⁸

IV. REQUEST FOR WAIVER

The Commission should grant a waiver of OAR 860-082-0025(1)(c) to allow Marquam Creek Solar to make a relatively limited reduction in its nameplate capacity necessary to maintain the economically feasible interconnection costs. The facts of this case present precisely the type of unique circumstances in an area of rapidly changing technologies and evolving interconnection requirements for small solar facilities that were not anticipated when the Commission adopted its Division 82 rules.

²⁴ OAR 860-082-0010.

²⁵ *Id.*

²⁶ *In re Rulemaking to Update Waiver Provisions in the Comm’n’s Admin. Rules*, Docket No. AR 554, Order No. 11-346 at 4 (Sept. 8, 2011).

²⁷ *Id.*

²⁸ *Id.*

The applicable administrative rule, OAR 860-082-0025(1)(c), provides in pertinent part as follows:

(1)(c) An applicant with a pending completed application to interconnect a small generator facility must submit a new application if the applicant proposes to make any change to the small generator facility other than a minor equipment modification. This includes changes affecting the nameplate capacity of the proposed small generator facility.

* * * *

(A) The applicant relinquishes the queue position assigned to the pending completed application, and the public utility assigns a new queue position based on the date and time the public utility receives the new application.

Good cause exists to waive this rule for the reasons set forth below.

A. Rigid Application of OAR 860-082-0025(1)(c) Is Inconsistent with Best Practices for Interconnection Procedures, which Routinely Allow for Capacity Reductions Analogous to that Proposed in this Petition.

Although OAR 860-082-0025(1)(c) provides interconnection customers no express right to reduce nameplate capacity during the interconnection process, interconnection procedures throughout the country allow for much more significant changes to the nameplate capacity than that requested here without any waiver or other analysis. Those rules recognize that the study process is an iterative process where the customer should be allowed to make changes responsive to the findings of the studies, such as the proposed change here that would “right size” the community solar facility for its distribution feeder without triggering PGE’s concerns with back-feeding.

The proposed reduction in capacity is in the range of only 100 kW, or five percent or less of the facility’s initial 2.0 MW capacity, and a de minimis downsizing of that magnitude is routinely allowed during interconnection procedures in effect across the country without loss of queue position. The Federal Energy Regulatory Commission’s (“FERC”) Large Generator

Interconnection Procedures contain a provision (at § 4.4) that requires acceptance of an interconnection customer’s proposed 15-percent reduction in capacity prior to the Facilities Study stage, such as the Facilities Re-Study currently under consideration for Marquam Creek Solar.²⁹ FERC also provides a right to make a reduction of up to 60 percent in capacity prior to the system impact study, which means total reductions of 75 percent are allowed under the FERC rules.³⁰ Further reductions are also potentially authorized under “material modification” review at any point.³¹

Similarly, FERC has approved a provision in the California Independent System Operator (“CAISO”) tariff that allows certain interconnection customers to reduce capacity by up to five percent for any reason after execution of the GIA but prior to commercial operation.³² That CAISO rule also allows reductions in excess of five percent where the reduction is necessitated by reasons beyond the interconnection customer’s control³³ – such as the changed circumstances here where PGE now concludes after execution of the GIA that Marquam Creek Solar’s initial capacity would cause aggregate load on the transformer to exceed daytime minimum load.

²⁹ See Order No. 845, 163 FERC ¶ 61,043, at P 407 (April 19, 2018) (discussing the FERC rules), *order on clarify. and reh’g*, 140 FERC ¶ 61,168 (Aug. 31, 2012); see also FERC’s Order No. 2003, 104 FERC ¶ 61,103, at PP 162-168 (July 24, 2003).

³⁰ Order No. 845, 163 FERC ¶ 61,043, at P 407.

³¹ *Id.* FERC’s small generator interconnection procedures (“SGIP”) do not contain these same express provisions, but they appear to encourage agreement to such revisions by the parties. *Standardization of Small Generator Interconnection Agreements and Procedures*, Order No. 2006, FERC Stats. & Regs. P 31,180, at Appendix E, at § 1.4 (May 12, 2005) (containing SGIP § 1.4); see also *id.* at Appendix E, Attachments 6 & 7 (stating in Feasibility Study Agreement and System Impact Study Agreements that if the Interconnection Customer modifies its Interconnection Request, the time to complete the study may be extended). However, if small generators under the FERC process choose to secure network resource interconnection service – as is typically required for all small generators under this Commission’s Division 82 rules – then the customer would use the LGIP and LGIA, including the right to make reductions to capacity. See *Small Generator Interconnection Agreements*, Order No. 792, 145 FERC ¶ 61,159, at P 232 & n. 425 (Nov. 22, 2013) (citing Order No. 2006, FERC Stats. & Regs. P 31,180, at P 140). Thus, the policy in Order No. 2003 is relevant to Oregon’s Division 82 process.

³² *Cal. Indep. Sys. Operator Corp.*, 138 FERC ¶ 61,060, 61,298 (Jan. 30, 2012).

³³ *Id.*

FERC explained this right “provides interconnection customers with increased flexibility to reduce the size of their generating facility without risking the need to start over with a new interconnection request[.]”³⁴ In this case, Marquam Creek Solar merely seeks to preserve the scope of upgrades and cost estimates included in its executed GIA. The proposed five-percent reduction here is therefore reasonable and even routine in the industry.

Indeed, FERC subsequently even approved a one-time opportunity for additional CAISO interconnection customers to reduce their capacity in their interconnection agreements by *any* amount.³⁵ CAISO had explained “one of the potential benefits of downsizing is that certain upgrades may no longer be necessary, or may be replaced by a lower-cost upgrade.”³⁶ In approving this request, FERC reasoned that “this one-time downsizing opportunity will help facilitate the completion and commercial operation of projects that would be viable but for an inability to construct the full generating capacity stated in the customers’ interconnection requests.”³⁷ FERC found that “this opportunity to downsize such projects will help ensure that more projects can achieve commercial operation, even though at a smaller scale than originally planned.”³⁸ That same reasoning applies equally here for Marquam Creek Solar, which expects it would be able to achieve commercial operation with the proposed minor capacity reduction.

Furthermore, there is no indication that the Commission intended OAR 860-082-0025(1)(c) to bar reductions to capacity in appropriate cases. The rule was adopted in Docket No. AR 521. Notably, Staff’s initially proposed rule allowed for reductions in capacity and only limited increases in capacity, similar to the treatment in FERC’s landmark Order No. 2003.³⁹

³⁴

Id.

³⁵

Cal. Indep. Sys. Operator Corp., 141 FERC ¶ 61,219, at 62,069 (Dec. 20, 2012).

³⁶

Id. at 62,065.

³⁷

Id. at 62,069.

³⁸

Id.

³⁹

Staff Comments, Docket No. AR 521, at p. 6 (Nov. 9, 2007).

After PacifiCorp advocated against the flexibility for capacity reductions,⁴⁰ Staff's initially proposed rule was later modified in a revised draft of the rules circulated by Administrative Law Judge Sarah Wallace, which ultimately became the rules published by the Secretary of State.⁴¹ No order or ruling by the Commission or the ALJ substantively addresses the lack of express flexibility to reduce the generator's capacity, even though the Oregon Department of Energy advocated for allowing changes in capacity.⁴² The upshot of this regulatory history is that although the final rules contained no express allowance for capacity reductions, the Commission itself did not identify any reason generators should not be allowed to reduce their capacity in appropriate circumstances. And as noted above, the rules contain a right for generators to seek a waiver of the requirement to submit a new application in the case of a capacity reduction.⁴³

Additionally, both PGE and PacifiCorp have previously agreed to allow reductions to interconnection capacity without loss of queue position and without seeking a waiver of the rule as Marquam Creek Solar does here. PGE agreed to a significant reduction in capacity from 2.2 MW to 1.13 MW for the Goose Creek Solar qualifying facility, queue SPQ0026, after the Facilities Study stage.⁴⁴ This reduction in capacity reduced the forecasted interconnection costs

⁴⁰ *PacifiCorp's Initial Comments*, Docket No. AR 521, at pp. 9-10 (Nov. 8, 2007).

⁴¹ *Notice of Proposed Rulemaking*, Docket No. AR 521 (April 15, 2008) (containing a definition of "Minor Equipment Modification" as a change that "[d]oes not affect the nameplate capacity of a small generator facility," at proposed OAR 860-082-0015(20)(c), and a requirement to submit a new application for any change that is not a Minor Equipment Modification, including "changes affecting the nameplate capacity of the proposed small generator facility," at proposed OAR 860-082-0020(1)(c)).

⁴² *In the Matter of a Rulemaking to Adopt Rules Related to Small Generator Interconnection*, Docket No. AR 521, Order No. 09-196 (June 8, 2009) (approving rules without discussing this point); *see also ODOE's Final Comments*, Docket No. AR 521, at p. 1 (Nov. 27, 2007) (proposing the rule should allow modifications to design capacity).

⁴³ The initially approved Division 82 rules contained a wavier provision, which was subsequently modified in non-material respect. *See In re Rulemaking to Update Waiver Provisions in the Comm'n's Admin. Rules*, Docket No. AR 554, Order No. 11-346 at App. A at p. 47 (Sept. 8, 2011).

⁴⁴ The interconnection studies for SPQ0026 are not available on PGE's OASIS website, but PGE supplied the information to Marquam Creek Solar, which is included in attachments to PGE's email dated January 15, 2021, which is included in Exhibit 9.

from \$1.4 million, which included extensive system upgrades, to just \$35,000 in the GIA, which was limited to minor distribution equipment.⁴⁵

In the case of PacifiCorp, Marquam Creek Solar has located at least two instances in publicly available evidence where the utility has allowed for changes to the nameplate capacity of the interconnection customer. First, the Northwest Energy 9, LLC qualifying facility, Q0586, had an initially proposed capacity of 9.9 MW, which resulted in over \$50 million in upgrade costs identified in the Feasibility Study, largely due to inclusion of a new 230 kV transmission line from Roundup substation to Wine Country substation.⁴⁶ But the interconnection capacity was reduced to 6 MW, which allowed the facility to avoid the most extensive system upgrades and reduce the cost estimates to \$1,742,000 in the System Impact Study and \$1,730,000 in the Facilities Study and be placed in service.⁴⁷ Second, PacifiCorp even allowed for an *increase* to the nameplate capacity of another community solar facility, even though such increases are not even automatically allowed under the FERC process. In queue OCS002, PacifiCorp allowed an increase from a seven-inverter system with nameplate capacity of 810 kW in the system impact study to an eight-inverter system with a nameplate capacity of 900 kW in the facilities study.⁴⁸ That increase of 90 kW was apparently allowed to take up additional space on the feeder that presumably became known as a result of the initial study, and it is comparable to the magnitude of the change requested here by Marquam Creek Solar.

⁴⁵ Exhibit 9.

⁴⁶ Tier 4 Feasibility Study for Q0586, at pp. 14-15 (Oct. 7, 2014), available on PacifiCorp's OASIS site, at <https://www.oasis.oati.com/woa/docs/PPW/PPWdocs/pacificorplgiaqis.htm>.

⁴⁷ Tier 4 System Impact Study for Q0586, at pp. 1, 13 (July 27, 2015), available on PacifiCorp's OASIS site, at <https://www.oasis.oati.com/woa/docs/PPW/PPWdocs/pacificorplgiaqis.htm>; Tier 4 Facilities Study for Q0586, at pp. 1, 13 (October 21, 2015), available on PacifiCorp's OASIS site, at <https://www.oasis.oati.com/woa/docs/PPW/PPWdocs/pacificorplgiaqis.htm>

⁴⁸ These studies are available on PacifiCorp OASIS website at: <http://www.oasis.oati.com/woa/docs/PPW/PPWdocs/pacificorpocsiaq.htm>.

In sum, reductions in capacity are common in interconnection processes, and although the Commission's rules do not expressly provide such a right, a waiver of the Commission's rules should not be unreasonably withheld.

B. OAR 860-082-0025(1)(c) Imposes an Unreasonable and Unjust Result on Marquam Creek Solar's Community Solar Facility by Quadrupling the Interconnection Costs Contained in Its Fully Executed GIA

Granting the waiver is in the public interest because the problem at hand arose due to no fault of Marquam Creek Solar, and a relatively minor reduction in nameplate capacity is a reasonable and simple solution. Marquam Creek Solar had already secured a fully executed GIA for its community solar facility. The GIA's cost estimate of \$268,350 was economically feasible for the facility and would allow the facility to be brought into service. The problem arose only after PGE subsequently proposed to re-study the Marquam Creek Solar's interconnection after a higher queued interconnection customer withdrew from the queue – due to no fault of Marquam Creek Solar. Indeed, the GIA contains no express reservation of PGE's right to impose such costs on Marquam Creek Solar or any express statement that its cost estimates are conditioned upon all higher queued interconnection customers completing construction of their facilities. Yet Marquam Creek Solar has cooperated with PGE's re-studies in good faith attempt to reach a mutually agreeable solution. Unfortunately, Marquam Creek Solar's good faith efforts have reached a roadblock. PGE's re-studies have quadrupled the cost estimate to \$1,100,053, which is cost prohibitive for 2.0 MW facility and will otherwise result in the development being abandoned.

Allowing for the proposed reduction to the capacity will allow the parties to maximize the use of PGE's distribution system for the purposes of bringing distributed generation online under Oregon's community solar program without cost-prohibitive and wastefully unnecessary

interconnection protective equipment. In contrast, rigid application of the administrative rule in this case would penalize Marquam Creek Solar for failing to guess – years ago when it entered the queue – the exact amount of distribution system capacity PGE would eventually determine to be available. Given PGE’s evolving and indefinite standards for measurement methods for determining whether generation on a feeder may exceed daytime minimum load and when 3V0 sensing will be required, it would not have been possible to accurately guess at the time it entered the queue that 3V0 sensing would be required if Marquam Creek Solar were 2.0 MW.

Additionally, unlike the higher queued generators on the Scotts Mills feeder at the time Marquam Creek Solar entered the queue, Marquam Creek Solar’s initially proposed capacity of 2.0 MW is less than PGE’s estimate of daytime minimum load of 2.105 MW. The higher queued generators on the feeder each had nameplate capacity in excess of PGE’s calculation of daytime minimum load, and thus exceeded that threshold on their own right.⁴⁹ It is only the additional net metering generation – and PGE’s evolving method of including it in calculation of the feeder’s aggregate capacity – that has caused PGE to conclude that Marquam Creek Solar requires the currently proposed protective equipment. As PGE itself acknowledged, net metering generation normally “would make no difference in protection requirements,” and therefore PGE agrees that it “has not always clarified its method of including existing [net metering] generation in the aggregate generation considered for protection requirements.”⁵⁰ Marquam Creek Solar’s current predicament was the product of PGE’s evolving methodologies and protection

⁴⁹ The following higher queued generators were in the queue to interconnect to the Scotts Mills feeder at the time of Marquam Creek Solar’s application but subsequently withdrew from the queue: (1) SPQ0037, 2.2 MW – withdrawn November 26, 2018; (2) SPQ0046, 2.5 MW – withdrawn September 10, 2019; (3) SPQ0073, 2.97 MW – withdrawn May 11, 2018; and (4) SPQ0074, 2.97 MW – withdrawn May 24, 2019. *See* PGE’s Small Generator Interconnection Que, available at <http://www.oasis.oati.com/pge/>. Another generator, SPQ0054 was also 2.0 MW, but that generator withdrew before Marquam Creek Solar entered the queue.

⁵⁰ PGE’s letter dated December 7, 2020, at p. 3, which is located in Exhibit 7.

requirements, and could not have been reasonably anticipated by Marquam Creek Solar when it selected 2.0 MW as its nameplate capacity upon entering the interconnection queue years ago.

Furthermore, the requested waiver would obviate the need for potential litigation between the parties over the events leading to the quadrupled cost estimates for Marquam Creek Solar's interconnection. Contractually, the parties are currently bound by a GIA that incorporates interconnection design that does not include the costly 3V0 sensing, and PGE wishes to amend such GIA to include that new equipment and functionality as identified in ongoing re-studies. Under Section 8.2 of the GIA, such amendments to the GIA may be made only by mutual agreement.⁵¹ Marquam Creek Solar is willing to agree to such amendment to incorporate the upgrades needed in re-studies if the GIA will also be amended to allow the capacity of Marquam Creek Solar to be downsized to a level below PGE's revised calculations of generation and daytime minimum load calculations on the feeder in order to avoid 3V0 sensing in favor of hotline blocking.

Marquam Creek Solar's interests should not be discarded in favor of PGE's concerns with potential harm to a lower queued interconnection customer. PGE appears to suggest that the minor capacity reduction requested by Marquam Creek Solar would harm a lower queued customer. Of course, Marquam Creek Solar was itself ensnared in its current predicament because higher queued customers' decisions to withdraw caused PGE to propose to re-study Marquam Creek Solar's interconnection. The letters supplied by PGE evidence a cascading re-study process that has led to numerous generators on the Scotts Mills feeder withdrawing from the queue, which would appear to demonstrate that it has not been easy to guess the capacity on the feeder for interconnection customers. But this circumstance only further supports Marquam

⁵¹ Marquam Creek Solar's GIA at § 8.2, which is attached as Exhibit 1.

Creek Solar's request here to allow it to make a minor adjustment to its nameplate capacity that would allow it to "right size" the generation on the feeder and end the cascading series of withdrawals.

In any event, it would be speculative to suggest lower queued customers would in fact be better off if this Petition is denied. If this Petition is denied or Marquam Creek Solar is otherwise forced to withdraw from the queue, lower queued customers would presumably be subjected to a re-study just as Marquam Creek Solar was in the past few years. Given PGE's ongoing revisions to the daytime minimum load and measurement of generation on the feeder, as well as what appears to be a continual increase of net metering on the feeder, it would be reasonable to expect that the lower queued interconnection customers will eventually suffer the same fate that Marquam Creek Solar has here. Therefore, any assertions that lower queued customers would be interconnected and successfully brought in service if the Commission denies this Petition are speculative. It is certain, however, that Marquam Creek Solar will pursue its interconnection if the Petition is granted, and therefore good cause exists for the Commission to grant it.

In sum, a minor reduction of less than five percent of the project's nameplate capacity of the facility would alleviate PGE's concerns with back-feeding and the professed need for \$1.1 million in upgrades, and it would allow Marquam Creek Solar to move forward with development and construction of its community solar facility without further delay and certain future litigation.

C. Marquam Creek Solar’s Requested Reduction in Capacity Is Consistent with the Commission’s Community Solar Implementation Plan and Is Necessary to Support a Community Solar Facility

Finally, the requested reduction in capacity is consistent with the Commission’s rules governing its community solar program, which allow for reductions in capacity of up to 200 kW without loss of pre-certification of the facility. The Commission-approved Oregon Community Solar Program Implementation Manual outlines the requirements for a project to become and remain pre-certified in the Program, and it allows Project Managers to amend their project size by less than 200 kW without losing their position in the CSP pre-certification queue.⁵² Thus, while this treatment may not be directly applicable to the interconnection procedures, it exhibits recognition by the Commission that the policy of encouraging the community solar program justifies the allowance for such capacity reductions. This right in the Community Solar Program’s Implementation Manual would be useless without corresponding changes to the interconnection capacity, and it should be understood as further evidence that the Commission should not unreasonably withhold waivers of the Division 82 rules in circumstances such as this case. Therefore, the Commission should apply a flexible standard in evaluating the requests for waiver to interconnection rules and grant Marquam Creek Solar’s request for waiver.

V. CONCLUSION

For the reasons set forth above, the Commission should grant the requested waiver of OAR 860-082-0025(1)(c).

⁵² *In re Public Util. Comm’n of Or., Community Solar Program Implementation*, Docket No. UM 1931, Order No. 19-438 at App. A at pp. 66-67 (Dec. 19, 2019).

Respectfully submitted on this 25th day of January 2021.

RICHARDSON ADAMS, PLLC

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Attorneys for Marquam Creek Solar, LLC

EXHIBITS

Exhibit 1..... Marquam Creek Solar’s GIA

Exhibit 2..... PGE Email, January 11, 2019

Exhibit 3.....PGE’s System Impact Re-Study, April 26, 2019

Exhibit 4..... PGE’s Facility Study Revised, August 13, 2019

Exhibit 5..... PGE Emails, September 10, 2019, and October 17, 2019

Exhibit 6.....PGE System Impact Re-Study, January 21, 2020

Exhibit 7.....PGE Letter, December 7, 2020

Exhibit 8..... Marquam Creek Solar’s Letter, December 11, 2020

Exhibit 9.....PGE Letter, December 17, 2020 and PGE Email, January 15, 2021

Exhibit 1

Marquam Creek Solar's GIA



Interconnection Agreement for Small Generator Facility Tier 1, Tier 2, Tier 3 or Tier 4 Interconnection

(Small Generator Facilities with Electric Nameplate Capacities of 10 MW or Less)

This Interconnection Agreement (sometimes also referred to as "Agreement") is made and entered into this 23rd day of October, 2018 by and between Marquam Creek Solar, LLC, an individual an Oregon limited liability company, ("Applicant") and Portland General Electric Company, a corporation existing under the laws of the State of Oregon, ("PGE"). Applicant and PGE each may be referred to as a "Party," or collectively as the "Parties."

Recitals:

Whereas, the Applicant is proposing to develop a Small Generator Facility, or to add generating capacity to an existing Small Generator Facility, consistent with the Application completed on July 24, 2017;

Whereas, the Applicant desires to interconnect the Small Generator Facility with PGE's Transmission and Distribution System (T&D System); and

Whereas, the Agreement shall be used for all approved Tier 1, Tier 2, Tier 3 and Tier 4 Interconnection Applications according to the procedures set forth in OPUC Rule OAR 860, Division 082 (Rule). Terms with initial capitalization, when used in this Agreement, shall have the meanings given in the Rule and, to the extent this Agreement conflicts with the Rule, the Rule shall take precedence.

Now, therefore, in consideration of and subject to the mutual covenants contained herein, the Parties agree as follows:

Article 1. **Scope and Limitations of Agreement**

1.1 Scope

The Agreement establishes standard terms and conditions approved by the Commission under which the Small Generator Facility with a Nameplate Capacity of 10 MW or less will interconnect to, and operate in parallel with PGE's T&D System. Additions, deletions or changes to the standard terms and conditions of an Interconnection Agreement will not be permitted unless they are mutually agreed to by the Parties or approved by the Commission if required by the Rule.

1.2 Power Purchase

The Agreement does not constitute an agreement to purchase, transmit, or deliver the Applicant's power nor does it constitute an electric service agreement.

1.3 Other Agreements

Nothing in the Interconnection Agreement is intended to affect any other agreement between PGE and the Applicant or another Interconnection Customer. However, in the event that the provisions of the Agreement are in conflict with the provisions of other PGE tariffs, PGE tariff shall control.

1.4 Responsibilities of the Parties

- 1.4.1 The Parties shall perform all obligations of this Agreement in accordance with all applicable laws.
- 1.4.2 The Applicant will construct; own, operate, and maintain its Small Generator Facility in accordance with the Agreement, IEEE Standard 1547 (2003 ed), the National Electrical Code (2005 ed) and applicable standards required by the Commission.
- 1.4.3 Each Party shall be responsible for the safe installation, maintenance, repair and condition of their respective lines and appurtenances on their respective sides of the Point of Interconnection. Each Party shall provide Interconnection Facilities that adequately protect the other Parties' facilities, personnel, and other persons from damage and injury. The allocation of responsibility for the design, installation, operation, maintenance and ownership of Interconnection Facilities is prescribed in the Rule.

1.5 Parallel Operation and Maintenance Obligations

Once the Small Generator Facility has been authorized to commence Parallel Operation by execution of the Interconnection Agreement, the Applicant will abide by all written provisions for operating and maintenance as required by the Rule and detailed by PGE in Form 7, title "Interconnection Equipment As Built Specifications, Initial Settings and Operating Requirements" a copy of which is provided on PGE's website.

1.6 Metering and Monitoring

The Interconnection Customer will be responsible for metering and monitoring as required by OAR 860-082-0070.

1.7 Power Quality

The Applicant will design its Small Generator Facility to maintain a composite power delivery at continuous rated power output at the Point of Interconnection that meets the requirements set forth in IEEE 1547. PGE may, in some circumstances, also require the Applicant to follow voltage or VAR schedules used by similarly situated, comparable generators in the control area. Any special operating requirements will be detailed in Form 7 provided on the Commission website and completed by PGE as required by the Rule. Under no circumstances shall these additional requirements for voltage or reactive power support exceed the normal operating capabilities of the Small Generator Facility. For purposes of this Agreement, "control area" shall mean an electrical system or systems bounded by interconnection metering and telemetry, capable of controlling generation to maintain its interchange schedule with other control areas and contributing to frequency regulation of the interconnection.

Article 2. Inspection, Testing, Authorization, and Right of Access

2.1 Equipment Testing and Inspection

The Applicant will test and inspect its Small Generator Facility Facilities prior to interconnection in accordance with IEEE 1547 Standards as provided for in the Rule. The Interconnection will not be final until the Witness Test and Certificate of Completion provisions in the Rule have been satisfied. Operation of the Small Generator Facility requires an-Interconnection Agreement; electricity sales require a Power Purchase Agreement.--To the extent that the Applicant decides to conduct interim testing of the Small Generator Facility prior to the Witness Test, it may request that PGE observe these tests and that these tests be deleted from the final Witness Test. If PGE agrees to send

qualified personnel to the Small Generator Facility to observe such interim testing, it will be doing so at its own expense unless the Parties agree otherwise

2.2 Right of Access

As provided in OAR 860-082-0020, PGE will have access to the Applicant's premises for any reasonable purpose in connection with the Interconnection Application and any Interconnection Agreement that is entered in to pursuant to this Rule or if necessary to meet the legal obligation to provide service to its customers. Access will be requested at reasonable hours and upon reasonable notice, or at any time without notice in the event of an emergency or hazardous condition.

Article 3. Effective Date, Term, Termination, and Disconnection

3.1 Effective Date

The Agreement shall become effective upon execution by the Parties.

3.2 Term of Agreement

The Agreement will be effective on the Effective Date and will remain in effect for a period of twenty (20) years or the life of the Power Purchase Agreement, whichever is shorter or a period mutually agreed to by Parties, unless terminated earlier by the default or voluntary termination by the Interconnection Customer or by action of the Commission.

3.3 Termination

No termination will become effective until the Parties have complied with all applicable laws and any clauses of the Rule or this Agreement applicable to such termination.

3.3.1 The Applicant may terminate this Agreement at any time by giving PGE twenty (20) business days written notice.

3.3.2 Either Party may terminate this Agreement after default pursuant to Article 5.6 of this Agreement.

3.3.3 The Commission may order termination of this Agreement.

3.3.4 Upon termination of this Agreement, the Small Generator Facility will be disconnected from PGE's T&D System at the Applicant's expense. The termination of this Agreement will not relieve either Party of its liabilities and obligations, owed or continuing at the time of the termination.

3.3.4 The provisions of this Article shall survive termination or expiration of this Agreement.

3.4 Temporary Disconnection

PGE or the Applicant may temporarily disconnect the Small Generator Facility from its T&D System for so long as reasonably necessary, as provided in OAR 860-082-0075 of the Rule, in the event one or more of the following conditions or events occurs:

3.4.1 Under emergency conditions, PGE or the Interconnection Customer may immediately suspend interconnection service and temporarily disconnect the Small Generator Facility. PGE shall notify the Applicant promptly when it becomes aware of an emergency condition that may reasonably be expected to affect the Small Generator Facility operation. The Applicant will notify PGE promptly when it becomes aware of an emergency condition that may reasonably be expected to affect PGE's T&D System. To the extent information is known, the notification shall describe the emergency condition, the extent of the damage or deficiency, the expected effect on the operation of both Parties' facilities and operations, its anticipated duration, and the necessary corrective action.

- 3.4.2 For routine Maintenance, Parties will make reasonable efforts to provide five (5) business days notice prior to interruption caused by routine maintenance or construction and repair to the Small Generator Facility or PGE's T&D system and shall use reasonable efforts to coordinate such interruption.
- 3.4.3 For Forced outages of the T&D System, PGE shall use reasonable efforts to provide the Applicant with prior notice of forced outages to effect immediate repairs to the T&D System. If prior notice is not given, PGE shall, upon request, provide the Applicant written documentation after the fact explaining the circumstances of the disconnection.
- 3.4.4 For disruption or deterioration of service, where PGE determines that operation of the Small Generator Facility will likely cause disruption or deterioration of service to other customers served from the same electric system, or if operating the Small Generator Facility could cause damage to PGE's T&D System, PGE may disconnect the Small Generator Facility. PGE will provide the Applicant upon request all supporting documentation used to reach the decision to disconnect. PGE may disconnect the Small Generator Facility if, after receipt of the notice, the Applicant fails to remedy the adverse operating effect within a reasonable time which shall be at least five (5) business days from the date the Applicant receives PGE's written notice supporting the decision to disconnect, unless emergency conditions exist, in which case the provisions of 3.4.1 of the Agreement apply.
- 3.4.5 If the Applicant makes any change other than Minor Equipment Modifications without prior written authorization of PGE, PGE will have the right to temporarily disconnect the Small Generator Facility.

3.5 Restoration of Interconnection

The Parties shall cooperate with each other to restore the Small Generator Facility, Interconnection Facilities, and PGE's T&D System to their normal operating state as soon as reasonably practicable following any disconnection pursuant to section 3.4.

Article 4. Cost Responsibility and Billing

The Applicant is responsible for the application fee and for such facilities, equipment, modifications and upgrades as required in 860-082-0035.

4.1 Minor T&D System Modifications

Modifications to the existing T&D System identified by PGE and set forth in Attachment A, such as changing meters, fuses or relay settings, are deemed Minor Modifications. It is PGE's sole discretion to decide what constitutes a Minor Modification. The Applicant will bear the costs of making such Minor Modifications as may be necessary to gain approval of an Application.

4.2 Interconnection Facilities

PGE will identify, under the study procedures of an Application review, the Interconnection Facilities necessary to safely interconnect the Small Generator Facility with PGE. Attachment A itemizes the Interconnection Facilities for the Applicant, including the cost of the facilities and the time required to build and install those facilities. The Applicant is responsible for the cost of the Interconnection Facilities.

4.3 Interconnection Equipment

The Applicant is responsible for all reasonable expenses, including overheads, associated with owning, operating, maintaining, repairing, and replacing its Interconnection Equipment.

4.4 System Upgrades

PGE will design, procure, construct, install, and own any System Upgrades. The actual cost of the System Upgrades, including overheads, is set forth in Attachment A and will be directly assigned to the Applicant. An Interconnection Customer may be entitled to financial compensation from other PGE Interconnection Customers who, in the future, benefit from the System Upgrades paid for by the Interconnection Customer. Such compensation will be governed by separate rules promulgated by the Commission or by terms of a tariff filed and approved by the Commission. Such compensation will only be available to the extent provided for in the separate rules or tariff.

4.5 Adverse System Impact

PGE is responsible for identifying Adverse System Impacts on any Affected Systems and for determining what mitigation activities or upgrades may be required to accommodate a Small Generator Facility. The actual cost of any actions taken to address the Adverse System Impacts, including overheads, shall be directly assigned to the Applicant. The Applicant may be entitled to financial compensation from other public utilities or other Interconnection Customers who, in the future, utilize the upgrades paid for by the Applicant, to the extent as allowed by the Commission. Adverse System Impacts are set forth in Attachment A.

4.6 Billings

PGE may require a deposit of not more than 50% of the cost estimate, not to exceed \$1,000, to be paid up front by the Applicant for studies necessary to complete an Application and to interconnect the Small Generator Facility to the T&D System. PGE may require a deposit of no more than 25% of the estimated costs, not to exceed \$10,000, for Interconnection Facilities necessary to complete an Application and to interconnect the Small Generator Facility to the T&D System. Progress billing, final billing and payment schedules must be agreed to by Parties prior to commencing work.

Article 5. Assignment, Liability, Indemnity, Force Majeure, Consequential Damages, and Default

5.1 Assignment

The Interconnection Agreement may be assigned by either Party upon fifteen (15) business days prior written notice. Except as provided in Articles 5.1.1 and 5.1.2, said assignment shall only be valid upon the prior written consent of the non-assigning Party, which consent shall not be unreasonably withheld.

5.1.1 Either Party may assign the Agreement without the consent of the other Party to any affiliate (which shall include a merger of the Party with another entity), of the assigning Party with an equal or greater credit rating and with the legal authority and operational ability to satisfy the obligations of the assigning Party under this Agreement;

5.1.2 The Applicant shall have the right to assign the Agreement, without the consent of PGE, for collateral security purposes to aid in providing financing for the Small Generator Facility. For Small Generator systems that are integrated into a building facility, the sale of the building or property will result in an automatic transfer of the Agreement to the new owner who shall be responsible for complying with the terms and conditions of this Agreement.

5.1.3 Any attempted assignment that violates this Article is void and ineffective. Assignment shall not relieve a Party of its obligations, nor shall a Party's

obligations be enlarged, in whole or in part, by reason thereof. An assignee is responsible for meeting the same obligations as the Applicant.

5.2 Limitation of Liability and Consequential Damages

A Party is liable for any loss, cost claim, injury, or expense including reasonable attorney's fees related to or arising from any act or omission in its performance of the provisions of an Interconnection Agreement entered into pursuant to the Rule except as provided for in ORS 757.300(4)(c). Neither Party will seek redress from the other Party in an amount greater than the amount of direct damage actually incurred.

5.3 Indemnity

5.3.1 This provision protects each Party from liability incurred to third parties as a result of carrying out the provisions of the Agreement. Liability under this provision is exempt from the general limitations on liability found in Article 5.2.

5.3.2 Each Party shall, to the extent allowed by law, and subject to the limitations imposed by ORS 30.260 to ORS 30.300, if applicable, at all times indemnify, defend, and hold the other Party harmless from, any and all damages, losses, claims, including claims and actions relating to injury to or death of any person or damage to property, demands, suits, recoveries, costs and expenses, court costs, attorney fees at trial and on appeal, and all other obligations by or to third parties (hereinafter "Harm"), arising out of or resulting from its negligent action or failure to meet its obligations under this Agreement. Such indemnity obligation shall be limited to the proportional extent the Harm is caused by the negligence of the indemnified Party.

5.3.3 If an indemnified person is entitled to indemnification under this Article as a result of a claim by a third party, and the indemnifying Party fails, after notice and reasonable opportunity to proceed under this Article, to assume the defense of such a claim, such indemnified person may at the expense of the indemnifying Party contest, settle or consent to the entry of any judgment with respect to, or pay in full, such claim.

5.3.4 If an indemnifying party is obligated to indemnify and hold any indemnified person harmless under this Article, the amount owing to the indemnified person shall be the amount of such indemnified person's actual loss, net of any insurance or other recovery.

5.3.5 Promptly after receipt by an indemnified person of any claim or notice of the commencement of any action or administrative or legal proceeding or investigation as to which the indemnity provided for in this Article may apply, the indemnified person shall notify the indemnifying party of such fact. Any failure of or delay in such notification shall not affect a Party's indemnification obligation unless such failure or delay is materially prejudicial to the indemnifying party.

5.3.6 The indemnifying Party shall have the right to assume the defense thereof with counsel designated by such indemnifying Party and reasonably satisfactory to the indemnified person. If the defendants in any such action include one or more indemnified persons and the indemnifying Party and if the indemnified person reasonably concludes that there may be legal defenses available to it and/or other indemnified persons which are different from or additional to those available to the indemnifying Party, the indemnified person shall have the right to select separate counsel to assert such legal defenses and to otherwise participate in the defense of such action on its own behalf. In such instances, the indemnifying

Party shall only be required to pay the fees and expenses of one additional attorney to represent an indemnified person or indemnified persons having such differing or additional legal defenses.

5.3.7 The indemnified person shall be entitled, at its expense, to participate in any such action, suit or proceeding, the defense of which has been assumed by the indemnifying Party. Notwithstanding the foregoing, the indemnifying Party (i) shall not be entitled to assume and control the defense of any such action, suit or proceedings if and to the extent that, in the opinion of the indemnified person and its counsel, such action, suit or proceeding involves the potential imposition of criminal liability on the indemnified person, or there exists a conflict or adversity of interest between the indemnified person and the indemnifying Party, in such event the indemnifying Party shall pay the reasonable expenses of the indemnified person, and (ii) shall not settle or consent to the entry of any judgment in any action, suit or proceeding without the consent of the indemnified person, which shall not be reasonably withheld, conditioned or delayed.

5.4 Consequential Damages

Neither Party shall be liable to the other Party, under any provision of the Agreement, for any losses, damages, costs or expenses for any special, indirect, incidental, consequential, or punitive damages, including but not limited to loss of profit or revenue, loss of the use of equipment, cost of capital, cost of temporary equipment or services, whether based in whole or in part in contract, in tort, including negligence, strict liability, or any other theory of liability; provided, however, that damages for which a Party may be liable to the other Party under another agreement will not be considered to be special, indirect, incidental, or consequential damages hereunder.

5.5 Force Majeure

5.5.1 As used in this Agreement, a Force Majeure Event shall mean “any act of God, labor disturbance, act of the public enemy, war, acts of terrorism, insurrection, riot, fire, storm or flood, explosion, breakage or accident to machinery or equipment through no direct, indirect, or contributory act of a Party, any order, regulation or restriction imposed by governmental, military or lawfully established civilian authorities, or any other cause beyond a Party’s control. A Force Majeure Event does not include an act of negligence or intentional wrongdoing.”

5.5.2 If a Force Majeure Event prevents a Party from fulfilling any obligations under this Agreement, the Party affected by the Force Majeure Event (Affected Party) shall promptly notify the other Party of the existence of the Force Majeure Event. The notification must specify in reasonable detail the circumstances of the Force Majeure Event, its expected duration, and the steps that the Affected Party is taking to mitigate the effects of the event on its performance, and if the initial notification was verbal, it should be promptly followed up with a written notification. The Affected Party shall keep the other Party informed on a continuing basis of developments relating to the Force Majeure Event until the event ends the Affected Party will be entitled to suspend or modify its performance of obligations under this Agreement (other than the obligation to make payments) only to the extent that the effect of the Force Majeure Event cannot be reasonably mitigated. The Affected Party will use reasonable efforts to resume its performance as soon as possible. The Parties shall immediately report to the Commission should a Force Majeure

Event prevent performance of an action required by Rule that the Rule does not permit the Parties to mutually waive.

5.6 Default

- 5.6.1 No default shall exist where such failure to discharge an obligation (other than the payment of money) is the result of a Force Majeure Event as defined in this Agreement, or the result of an act or omission of the other Party. Upon a default, the non-defaulting Party shall give written notice of such default to the defaulting Party. Except as provided in Article 5.6.2, the defaulting Party shall have sixty (60) calendar days from receipt of the default notice within which to cure such default; provided however, if such default is not capable of cure within sixty (60) calendar days, the defaulting Party shall commence such cure within twenty (20) calendar days after notice and continuously and diligently complete such cure within six (6) months from receipt of the default notice; and, if cured within such time, the default specified in such notice shall cease to exist.
- 5.6.2 If a default is not cured as provided for in this Article, or if a default is not capable of being cured within the period provided for herein, the non-defaulting Party shall have the right to terminate the Agreement by written notice at any time until cure occurs, and be relieved of any further obligation hereunder and, whether or not that Party terminates the Agreement, to recover from the defaulting Party all amounts due hereunder, plus all other damages and remedies to which it is entitled at law or in equity. Alternately, the non-defaulting Party shall have the right to seek dispute resolution pursuant to Article 7 with the Commission in lieu of default. The provisions of this Article will survive termination of the Agreement.

Article 6. Insurance

A Party is liable for any loss, cost claim, injury, or expense including reasonable attorney's fees related to or arising from any act or omission in its performance of the provisions of this Rule or the Interconnection Agreement entered into pursuant to this Rule.

- 6.1 Pursuant to the Rule adopted by the Commission, PGE may not require the Interconnection Customer to maintain general liability insurance in relation to the interconnection of a Small Generator Facility with an Electric Nameplate Capacity of 200 kW or less. With regard to the interconnection of a Small Generator Facility with an Electric Nameplate Capacity equal to or less than 10 MW but in excess of 200 kW, the Interconnection Customer shall, at its own expense, maintain in force throughout the period of this Agreement general liability insurance sufficient to protect any person (including PGE) who may be affected by the Interconnection Customer's Small Generator Facility and its operation and such insurance shall be sufficient to satisfy the Interconnection Customer's indemnification responsibilities under Article 5.3 of this Agreement.
- 6.2 Within ten (10) business days following execution of this Agreement, and as soon as practicable after the end of each fiscal year or at the renewal of the insurance policy and in any event within ninety (90) calendar days thereafter, the Interconnection Customer shall provide the Public Utility with certification of all insurance required in this Agreement, executed by each insurer or by an authorized representative of each insurer.
- 6.3 All insurance required by this Article 6 shall name the Public, its parent, associated and Affiliate companies and their respective directors, officers, agents, servants and employees ("Other Party Group") as additional insured. All policies shall contain provisions whereby

the insurers waive all rights of subrogation against the Other Party Group and provide thirty (30) calendar days advance written notice to the Other Party Group prior to anniversary date of cancellation or any material change in coverage or condition. The Interconnection Customer's insurance shall contain provisions that specify that the policies are primary and shall apply to such extent without consideration for other policies separately carried and shall state that each insured is provided coverage as though a separate policy had been issued to each, except the insurer's liability shall not be increased beyond the amount for which the insurer would have been liable had only one insured been covered. The insurance policies, if written on a Claims First Made Basis, shall be maintained in full force and effect for two (2) years after termination of this Agreement, which coverage may be in the form of tail coverage or extended reporting period coverage if agreed by the Parties.

- 6.4 The Parties agree to report to each other in writing as soon as practical all accidents or occurrences resulting in injuries to any person, including death, and any property damage arising out of this Agreement.
- 6.5 The requirements contained herein as to insurance are not intended to and shall not in any manner limit or qualify the liabilities and obligations assumed by the Parties under this Agreement.

Article 7. Dispute Resolution

Parties will adhere to the dispute resolution provisions in OAR 860-082-0080.

Article 8. Miscellaneous

8.1 Governing Law, Regulatory Authority, and Rules

The validity, interpretation and enforcement of the Agreement and each of its provisions shall be governed by the laws of the State of Oregon, without regard to its conflicts of law principles. The Agreement is subject to all applicable laws. Each Party expressly reserves the right to seek changes in, appeal, or otherwise contest any laws, orders, or regulations of a governmental authority.

8.2 Amendment

The Parties may mutually agree to amend the Agreement by a written instrument duly executed by both Parties in accordance with provisions of the Rule and applicable Commission Orders and provisions of the laws if the State of Oregon.

8.3 No Third-Party Beneficiaries

The Agreement is not intended to and does not create rights, remedies, or benefits of any character whatsoever in favor of any persons, corporations, associations, or entities other than the Parties, and the obligations herein assumed are solely for the use and benefit of the Parties, their successors in interest and where permitted, their assigns.

8.4 Waiver

- 8.4.1 The failure of a Party to the Agreement to insist, on any occasion, upon strict performance of any provision of the Agreement will not be considered a waiver of any obligation, right, or duty of, or imposed upon, such Party.
- 8.4.2 The Parties may agree to mutually waive a section of this Agreement so long as prior Commission approval of the waiver is not required by the Rule.
- 8.4.3 Any waiver at any time by either Party of its rights with respect to the Agreement shall not be deemed a continuing waiver or a waiver with respect to any other

failure to comply with any other obligation, right, or duty of the Agreement. Any waiver of the Agreement shall, if requested, be provided in writing.

8.5 Entire Agreement

The Interconnection Agreement, including any supplementary Form attachments that may be necessary, constitutes the entire Agreement between the Parties with reference to the subject matter hereof and supersedes all prior and contemporaneous understandings or agreements, oral or written, between the Parties with respect to the subject matter of the Agreement. There are no other agreements, representations, warranties, or covenants that constitute any part of the consideration for, or any condition to, either Party's compliance with its obligations under the Agreement.

8.6 Multiple Counterparts

The Agreement may be executed in two or more counterparts, each of which is deemed an original but all constitute one and the same instrument.

8.7 No Partnership

The Agreement will not be interpreted or construed to create an association, joint venture, agency relationship, or partnership between the Parties or to impose any partnership obligation or partnership liability upon either Party. Neither Party shall have any right, power or authority to enter into any agreement or undertaking for, or act on behalf of, or to act as or be an agent or representative of, or to otherwise bind, the other Party.

8.8 Severability

If any provision or portion of the Agreement shall for any reason be held or adjudged to be invalid or illegal or unenforceable by any court of competent jurisdiction or other governmental authority; (1) such portion or provision shall be deemed separate and independent; (2) the Parties shall negotiate in good faith to restore insofar as practicable the benefits to each Party that were affected by such ruling; and (3) the remainder of the Agreement shall remain in full force and effect.

8.9 Subcontractors

Nothing in the Agreement shall prevent a Party from utilizing the services of any subcontractor, or designating a third party agent as one responsible for a specific obligation or act required in the Agreement (collectively subcontractors), as it deems appropriate to perform its obligations under the Agreement; provided, however, that each Party will require its subcontractors to comply with all applicable terms and conditions of the Agreement in providing such services and each Party will remain primarily liable to the other Party for the performance of such subcontractor.

8.9.1 The creation of any subcontract relationship shall not relieve the hiring Party of any of its obligations under the Agreement. The hiring Party shall be fully responsible to the other Party for the acts or omissions of any subcontractor the hiring Party hires as if no subcontract had been made. Any applicable obligation imposed by the Agreement upon the hiring Party shall be equally binding upon, and will be construed as having application to, any subcontractor of such Party.

8.9.2 The obligations under this Article will not be limited in any way by any limitation of subcontractor's insurance.

8.10 Reservation of Rights

Either Party will have the right to make a unilateral filing with the Commission to modify the Interconnection Agreement. This reservation of rights provision will include but is not limited to modifications with respect to any rates terms and conditions, charges, classification of service, rule or regulation under tariff rates or any applicable State or

If to PGE (complete if different than Article 9.1 above):

Attention: _____
Address: _____
City: _____ State: _____ Zip: _____

9.4 Designated Operating Representative

The Parties will designate operating representatives to conduct the communications which may be necessary or convenient for the administration of the operations provisions of the Agreement. This person will also serve as the point of contact with respect to operations and maintenance of the Party's facilities:

Applicant's Operating Representative (complete if different than Article 9.1 above):

Attention: _____
Address: _____
City: _____ State: _____ Zip: _____
Phone: _____
Fax: _____
E-mail: _____

PGE's Operating Representative (complete if different than Article 9.1 above):

Attention: _____
Address: _____
City: _____ State: _____ Zip: _____
Phone: _____
Fax: _____
E-mail: _____

9.5 Changes to the Notice Information

Either Party may change this notice information by giving five (5) business days written notice prior to the effective date of the change.

Federal law or regulation. Each Party shall have the right to protest any such filing and to participate fully in any proceeding before the Commission in which such modifications may be considered.

Article 9. Notices and Records

9.1 General

Unless otherwise provided in the Agreement, any written notice, demand, or request required or authorized in connection with the Agreement shall be deemed properly given if delivered in person, delivered by recognized national courier service, or sent by first class mail, postage prepaid, to the person specified below:

If to the Applicant:

Applicant: Marquam Creek Solar, LLC
Attention: Greenkey Solar, LLC
Address: 73 W Monroe St
City: Chicago State: IL Zip: 60603
Phone: (336) 706-2043
Fax: _____
E-mail: Hunter@greenkeysolar.com

If to PGE:

Attention: Small Power Production
Address: 121 SW Salmon St., 3WTC0402
City: Portland State: OR Zip: 97204
Phone: 503-464-7264
Fax: 503-464-2115
E-mail: small.powerproduction@pgn.com

9.2 Records

The utility will maintain a record of all Interconnection Agreements and related Form attachments for as long as the interconnection is in place as required by OAR 860-082-065. PGE will provide a copy of these records to the Applicant or Interconnection Customer within fifteen (15) business days if a request is made in writing.

9.3 Billing and Payment

Billings and payments shall be sent to the addresses set out below:

If to the Applicant (complete if different than Article 9.1 above):

Applicant: _____
Attention: _____
Address: _____
City: _____ State: _____ Zip: _____

Article 10. Signatures

IN WITNESS WHEREOF, the Parties have caused the Agreement to be executed by their respective duly authorized representatives.

For the Applicant:

Signature: _____

Printed Name: _____

Title (if applicable): _____

Date: _____

For PGE:

Signature: _____

Printed Name: _____

Title: _____

Date: _____

Attachment A

Description and Costs of Minor Modifications, Interconnection Facilities,
System Upgrades, and Adverse System Impacts

The following System Upgrades are required:

- Install a new primary service including a bi-direction meter and CT's.
- Replace Fuses 3762 with a new set of 100T rated fuses.
- Install a transfer trip protection scheme via fiber optic cable using SEL Mirror Bits Protocol.

PGE's Responsibilities

PGE will engineer, 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.

On the Scotts Mills-13 feeder PGE will engineer, install and maintain a new set of 100T fuses to replace Fuses 3762.

PGE will engineer, procure and install a transfer trip protection scheme using SEL Mirror Bits Protocol over fiber optic cable. PGE will install the fiber along the existing distribution path from the substation to the point of interconnection.

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 need to purchase and install a small vault along the same path as the conduit. The vault needs to be located between the outside fence of the generation facility and the riser pole. The vault will contain laterals, provided by PGE, that can be used as an isolation point for PGE crews. Vault specifications will be provided during the engineering of the new primary service.

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

For the communications fiber 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 communications fiber.

Distribution Requirements	\$32,000.00
Substation Requirements	\$236,350.00
Total	\$268,350.00

Attachment B

**Description of Interconnection Facilities
and Metering Equipment Operated or Maintained by the Public Utility**

PGE will only own the following interconnection equipment at the site:

- Primary voltage service conductors from PGE's area feeder circuit to the termination point in PV plant's switchgear, and
- Metering equipment (Meter, potential transformers, current transformers and associated wiring) that will be installed in the applicant-supplied switchgear.

Periodic maintenance of PGE owned equipment will be needed to ensure accuracy and function. The maintenance will occur on a regular cycle and be set forth by PGE. If at any time the equipment is damaged, the Applicant, or any subsequent assignees of this Agreement, may be held responsible for all associated costs. If at any point, the Applicant wishes to make any changes to the Interconnection Facilities that require PGE personnel or equipment, the Applicant is responsible for all associated costs.

The Applicant shall pay for the cost of the Interconnection Facilities itemized in this Agreement as well as engineering, procurement, construction, and commissioning costs of PGE provided interconnection facilities and distribution upgrades contemplated by this Agreement. The cost set forth herein is only for the scopes of work that will be performed by PGE. Costs for any work being performed by the Applicant or for any Applicant-owned, supplied and installed equipment and associated design and engineering are not included.

PGE will not perform services under this Agreement until payments are received by PGE as set forth under this Agreement. Payments must be received by PGE within thirty (30) calendar days of the issuance of PGE's invoice to Applicant. Applicant will be in default per Section 5.6 of the Agreement if PGE does not receive payment of any sum due to PGE within said (30) days.

Within one hundred and twenty (120) calendar days of completing the construction and installation of PGE's interconnection facilities and Distribution Upgrades described in this Agreement, PGE shall provide Applicant with a final accounting report of any difference between (1) the actual cost incurred to complete the construction and installation and the budget estimate provided to the Applicant and a written explanation for any significant variation; and (2) the Applicant's previous deposit and aggregate payments to PGE for such interconnection facilities and distribution upgrades. If the Applicant's cost responsibility exceeds its previous deposit and aggregate payments, PGE shall invoice the Applicant for the amount due and the Applicant shall make payment to PGE within thirty (30) calendar days. If the Applicant's previous deposit and aggregate payments exceed its cost responsibility under this Agreement, PGE shall refund to Applicant an amount equal to the difference within thirty (30) calendar days of the final accounting report.

The Applicant 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.

Attachment C

One-Line Diagram

One-line diagram depicting the Generator Facility, Interconnection Facilities, metering equipment, and upgrades including safety lockout features and any special accessibility requirements.

To be filled in with as-built drawings later

Attachment D

Scope of Work/Milestones

In-Service Date: February 28, 2020

Critical milestones and responsibility as agreed to by the Parties:

	<u>Milestone/Date</u>	<u>Responsible Party</u>
(1)	<u>Executed Interconnection Agreement / 11-7-2018</u>	<u>Marquam Creek</u>
(2)	<u>\$10,000 of Estimated Cost / 11-7-2018</u>	<u>Marquam Creek</u>
(3)	<u>Engineering Starts / 11-26-2018</u>	<u>PGE</u>
(4)	<u>Payment of \$79,450 / 12-28-2018</u>	<u>Marquam Creek</u>
(5)	<u>*Engineering Complete / 3-29-2019</u>	<u>PGE</u>
(6)	<u>Payment of \$89,450 / 4-22-2019</u>	<u>Marquam Creek</u>
(7)	<u>PGE Construction Scheduled / 5-31-2019</u>	<u>PGE</u>
(8)	<u>Payment of \$89,450 / 11-25-2019</u>	<u>Marquam Creek</u>
(9)	<u>Switchgear Installed and Inspection / 12-30-2019</u>	<u>Marquam Creek</u>
(10)	<u>Interconnection Facilities Complete / 1-31-2020</u>	<u>PGE</u>
(11)	<u>Testing and Commissioning / 2-14-2020</u>	<u>Marquam Creek</u>
(12)	<u>In-Service Date / 2-28-2020</u>	<u>PGE</u>

* 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.

Attachment E

Additional Operating Requirements

No additional operating requirements have been placed on Marquam Creek.

Exhibit 2

PGE Email – January 11, 2019

Re-study required, SPQ0093

Small Power Production <Small.PowerProduction@pgn.com>
To: Hunter Strader <hunter@greenkeysolar.com>
Cc: Small Power Production <Small.PowerProduction@pgn.com>

Fri, Jan 11, 2019 at 10:16 AM

Hello,

Recently, the highest queued project on the Scotts-Mills-13 feeder withdrew from the interconnection process. This withdrawal will impact the Interconnection Requirements for all the projects on the feeder, including SPQ0093, Marquam Creek Solar. To properly evaluate the interconnection requirements, we will need to conduct a new System Impact Study and Facility Study for your project.

To begin the process, we will need you to sign a new System Impact Study Agreement and pay another \$1,000 deposit. Attached is the agreement for you to fill out. The signed agreement and the deposit are due by February 4, 2019. After the studies are completed, we can make any necessary changes to the Interconnection Agreement. During the re-study process, activity under the Interconnection Agreements will be paused and no milestone payments will be collected.

Please let me know if you have any questions.

Nikee Weber



QF Interconnection Specialist • 503-464-2264 • 503-464-8300

PortlandGeneral.com • Follow us on social @PortlandGeneral


 **Marquam Creek Solar SPQ0093 - System Impact Study Agreement.pdf**
150K

Exhibit 3

PGE's System Impact Re-Study

April 26, 2019

Portland General Electric



System Impact Study

Interconnection Request:

Marquam Creek Solar – 2.00 MWAC

SPQ0093

April 26, 2019



Table of Contents

1. Introduction	3
2. System Impact Study Scope	3
3. System Impact Study Assumptions	4
4. System Impact Study Interconnection Requirements.....	5
5. Cost Estimate.....	6
6. Schedule	6
7. Higher Queued Projects.....	7
8. Attachment A- Detailed System Impact Study Report.....	7



1. Introduction

On July 24th, 2017, Portland General Electric (PGE) received a completed Small Generator Interconnection Request for Marquam Creek Solar, LLC's ("Interconnection Customer") Marquam Creek Solar project ("Interconnection Request"). The Interconnection Request seeks to interconnect a 2.00 MWAC solar facility located in Clackamas county, Oregon at approximate GPS coordinates 45.08308, -122.672222. The interconnection point will be on PGE's Scotts Mills 13 distribution feeder connected to the Scotts Mills substation.

As set forth in the Oregon Administrative Rules 860-082-015(29), PGE has assigned queue number SPQ0093 to the Interconnection Request.

On February 1, 2019, 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 Qualifying 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: April 24, 2019 (i) were directly interconnected to PGE's Distribution System; (ii) were interconnected 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.
- Interconnection Request was modeled at its maximum capability of 2.00 MWAC.
- The Point of Interconnection will be on PGE's Scotts Mills 13 distribution feeder at GPS coordinates 45.08308, -122.672222.
- 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 revenue meter.
- 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 engineering design (conducted after an Interconnection Agreement is executed and funded) the path must be modified, then it may result in additional cost and timing delays for the Interconnection Customer.
- Generator tripping may be required under outages, emergency or abnormal system conditions.
- 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 stated in the Interconnection Customer's Interconnection Request.
- The interconnection was studied with:



- 1 SMA, Sunny Central SC-2200US inverters with reactive power capabilities as shown in the provided Interconnection Request.
- This report is based on information available at the time of the study April 24, 2019.

4. System Impact Study Interconnection Requirements

A System Impact Study was performed for SPQ0093. During the study equipment was monitored for voltage, loading, and short circuit violations. Based on the study results, the following are the distribution related impacts pertaining to this interconnection request.

Distribution System Modifications

The analysis showed the interconnection of SPQ0093 will overload an existing 65T fuse located on NE Cascade Hwy 213, approximately 300 feet north of Marquam Canby Rd. To resolve this, the fuses will need be replaced with a set of electronic reclosers.

The addition of SPQ0093 causes under voltage violations during light loading conditions. To resolve this, the voltage set point on the Scotts Mills BR1 Voltage Regulator will need to be increased from 120.0V to 121.0V to resolve downstream under voltage violations on Mt. Angel-Scotts Mills Road and Heinz Road.

The analysis determined during light and heavy load conditions the generating facility may cause voltage flicker issues on the feeder. The Interconnection Customer will be required to use dynamic reactive current support to mitigate this concern.

The cost associated with dynamic reactive current support will be borne by the Interconnection Customer and is not included in PGE's cost estimate.

To properly service the generating facility, the installation of a new primary service and metering package will be needed

Protection Requirements

The daytime minimum load on the Scotts Mills 13 feeder is 2.06 MW which occurred on May 3, 2018. Additionally, the daytime minimum load on the Scotts Mills substation transformer is 2.06 MW which occurred on May 3, 2018. The Scotts Mills substation transformer is rated at 9.4 MW. When you include SPQ0093 the amount of existing and proposed generation on the substation transformer totals 7.74 MW.

Under the conditions outlined above the generation can carry the entire transformer load and will backflow into the transmission system. This causes the potential for the individual generators to feed one another and slows their response time for disconnection during a fault



condition. To ensure the generation is offline within 2 seconds a transfer trip protection scheme is required. Transfer trip requires running a fiber optic line from the Scotts Mills substation to the point of interconnection which is approximately 2.8 miles.

Proposed preceding interconnections take a similar path from the substation and will cover approximately .30 miles of this distance should the projects be constructed. If the higher-queued projects are built and provide for .30 miles of fiber optic line, then SPQ0093 would be responsible for the remaining 2.5 miles of fiber optic line. If the higher queued projects are not built, SPQ0093 would be responsible for the entire approximately 2.8 miles of fiber optic line.

Additionally, to accomplish transfer trip an RTAC (SEL-3530) will need to be added at the substation. The existing connections are accounted for by higher preceding interconnections. The RTAC allows PGE to expand the communication connections.

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 (Equipment outside the substation)	\$60,500.00
Protection Requirements (Equipment Inside the Substation)	\$68,900.00
Communications Requirements (Fiber)	\$188,613.00
New Service Metering	\$30,000.00
Total	\$348,013.00

6. Schedule

PGE estimates it will require approximately 24 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.

The interconnection of SPQ0093 is dependent on several higher queued projects completing their interconnection requirements. Those prerequisite requirements are listed below:



Queue Position	Prerequisite Interconnection Requirements
SPQ0046	VT on the feeder, feeder breaker, Circuit switcher, Upgrade Transformer protection, High side VT.

7. Higher Queued Projects

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 Scotts Mills 13 feeder.

Queue Position	AC Nameplate Rating	Status	Estimated In-Service Date
SPQ0046	2.5 MW	System Impact Study	TBD
SPQ0074	2.97 MW	System Impact Study	TBD

8. Attachment A- Detailed System Impact Study Report (attached below)

SYSTEM IMPACT STUDY FOR SPQ0093 revision

Marquam Creek Solar

Prepared by

POWER Engineers, Inc.



Contents

INTERCONNECTION INFORMATION.....	10
Customer Information	10
Interconnection Summary	10
Distribution Line Related Upgrades (PGE Responsibility)	11
INTERCONNECTION REQUESTS ASSOCIATED WITH THIS SUBSTATION.....	12
BASE CASE INFORMATION FOR LIGHT LOADING CONDITIONS	13
Light Loading Information.....	13
Feeder Loading Information	13
Feeder Voltage Profile for Light Loading Conditions	13
Fault Current Profile.....	14
Pertinent Violations	14
DG INTERCONNECTION – LIGHT LOADING	15
DG Location.....	15
Feeder Voltage Profile for Light Loading Conditions	15
System Backfeed.....	15
Transmission Planning Recommendations	15
Fault Current Profile.....	16
Pertinent Violations	17
BASE CASE INFORMATION FOR HEAVY LOADING CONDITIONS.....	18
Heavy Loading Information.....	18
Feeder Loading Information	18
Feeder Voltage Profile for Heavy Loading Conditions	18
Pertinent Violations	19
DG INTERCONNECTION – HEAVY LOADING	20
Feeder Voltage Profile for Heavy Loading Conditions	20
System Backfeed.....	20
Pertinent Violations	21
SYSTEM IMPROVEMENTS – LIGHT LOADING	22
System Improvement Summary	22
Feeder Voltage Profile for Light Loading Conditions	22
Fault Current Profile.....	23



Pertinent Violations	23
DG Interconnection – Light Loading	24
Feeder Voltage Profile for Light Loading Conditions	24
System Backfeed	24
Fault Current Profile.....	25
Pertinent Violations	25
SYSTEM IMPROVEMENTS – HEAVY LOADING.....	26
Feeder Voltage Profile for Heavy Loading Conditions	26
Pertinent Violations	26
DG Interconnection – Heavy Loading	27
Feeder Voltage Profile for Heavy Loading Conditions	27
System Backfeed	27
Pertinent Violations	27
APPENDIX A: LINKS TO SUPPORTING DOCUMENTATION	28
APPENDIX B: EQUIPMENT RATINGS AND STANDARDS.....	29
Cutouts.....	29
Gang Operated Switches.....	29
Reclosers	30
IEEE Voltage Range/Clearing Times Table	32



INTERCONNECTION INFORMATION

Customer Information

Queue Position	SPQ0093
Applicant Name	Marquam Creek Solar
System Impact Study Commitment Date	04/11/2019
Size of Proposed Facility (MW)	2.0 MW AC
Coordinates or Facility Location	45.08308, -122.672222
Inverter Type(s)	SMA SC-2200-US (or equivalent)
Engineer Performing SIS	Cameron Van Leuven (POWER Engineers, Inc)

Interconnection Summary

System Impact Study was performed for Marquam Creek Solar on the Scotts Mills Substation, feeder Scotts Mills - Scotts Mills 13. The system was simulated and analyzed for voltage, loading, and short circuit violations.

Based on the study results, the following are the distribution related impacts pertaining to this interconnection request:

- Increase Scotts Mills Regulator BR1 voltage set point from 120.0V to 121.0V to resolve under voltage
- Replace overloaded 65T (FUSE_29217) on NE Cascade Hwy 213 at bypass switch 3762 with electronic recloser bank
- Add Dynamic VAR support for flicker.
- Install one (1) 300-amp Solid-Blade disconnect cutouts and service metering at DER lateral.

SPQ0093 causes under voltage violations at worst case of 94.5% (113.4V at a 120V base) during light loading conditions. Increase Scotts Mills Regulator BR1 voltage set point from 120.0V to 121.0V to resolve downstream under voltage violations on Mt Angels Scotts Rd and Heinz Rd.

The maximum primary voltage fluctuation was measured to be ~4.5% during light loading conditions with upgrades and 4.8% during heavy loading conditions with upgrades, thus Dynamic VAR Support has been recommended to mitigate these voltage flicker issues.

Backfeed onto the transmission system occurs with the addition of the DER during Light and Heavy loading conditions thus further studies into the impacts to the transmission system are recommended.



Distribution Line Related Upgrades (PGE Responsibility)

Description	Estimated Cost
1 – Electronic Recloser	\$60,000
1 – Substation Regulator Setpoint Adjustment	\$500

Total Estimated Distribution Line Cost	\$60,500
---	-----------------



INTERCONNECTION REQUESTS ASSOCIATED WITH THIS SUBSTATION

Queue Pos #	Feeder Name	Xfmr Pos #	GPS Coordinates	DG Size (MW AC)	Status
SPQ0037	Scotts Mills-Scotts Mills 13	BR1	N/A	2.2	Withdrawn
SPQ0046	Scotts Mills-Scotts Mills 13	BR1	N/A	2.5	System Impact Study
SPQ0054	Scotts Mills-Scotts Mills 13	BR1	N/A	2	Withdrawn
SPQ0073	Scotts Mills-Scotts Mills 13	BR1	N/A	2.97	Withdrawn
SPQ0074	Scotts Mills-Scotts Mills 13	BR1	N/A	2.97	System Impact Study
SPQ0093	Scotts Mills-Scotts Mills 13	BR1	45.08308, -122.672222	2	System Impact Study
SPQ0156	Scotts Mills-Scotts Mills 13	BR1	N/A	2.5	Withdrawn



BASE CASE INFORMATION FOR LIGHT LOADING CONDITIONS

Substation Name	Scotts Mills
Interconnecting Feeder Name	Scotts Mills - Scotts Mills 13
Substation Transformer Position # (e.g. WR1, BR1)	BR1

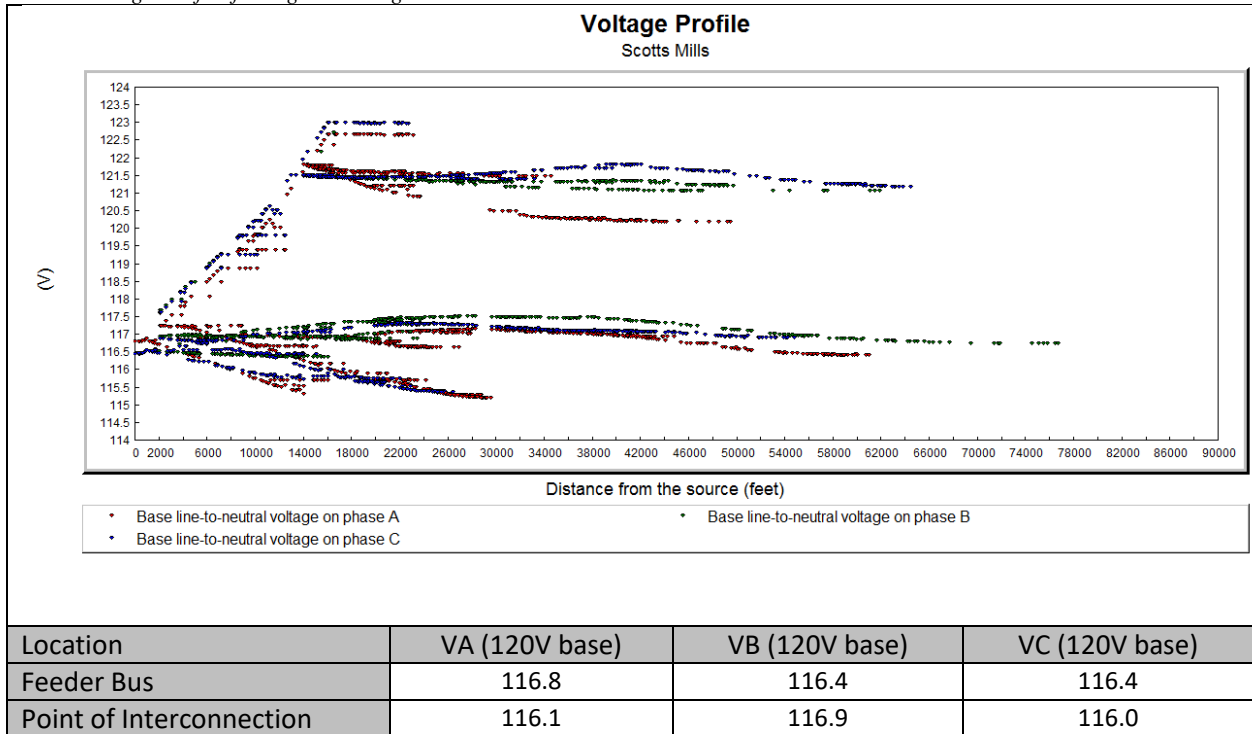
Light Loading Information

Simulated Date	5/3/2018
Simulated Hour	13:00

Feeder Loading Information

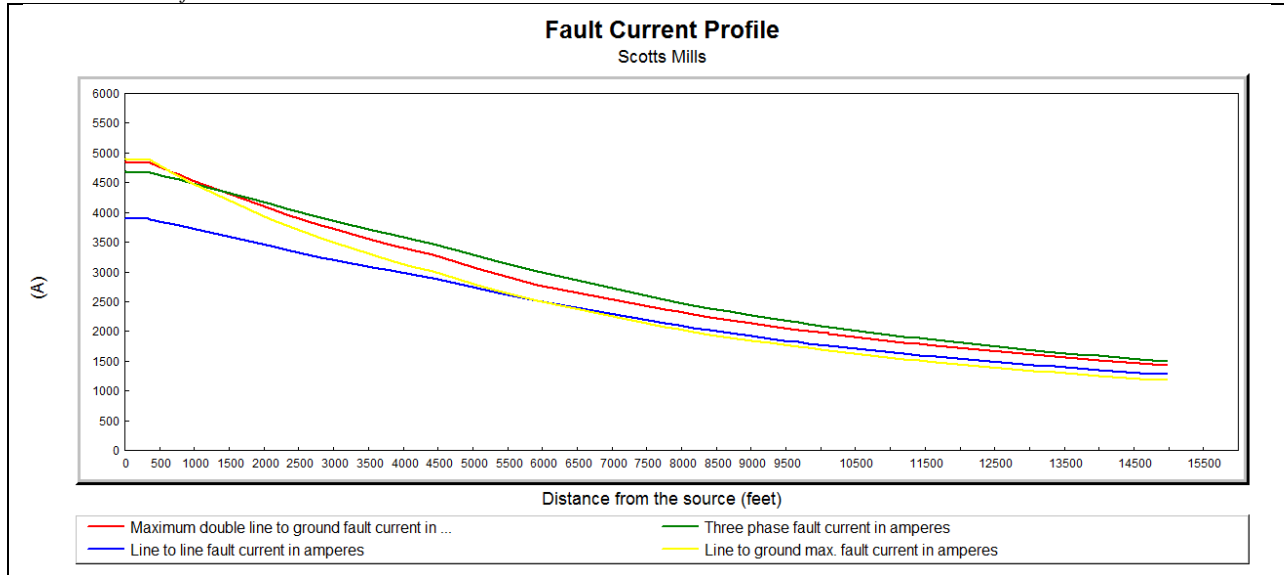
Feeder Name	Transformer Position	Loading (KW)	Loading (KVAR)
Scotts Mills - Scotts Mills 13	BR1	2060	-1297

Feeder Voltage Profile for Light Loading Conditions





Fault Current Profile



Device Type or ID	Distance From Substation (ft.)	Bidirectional ? (Y/N)	Continuous Rating (Amps)	Momentary Symmetrical, Asymmetrical Interrupting Rating (Amps)	Max Fault Current (Amps)
BREAKER_SCOTTS MILLS R106, BREAKER_A_UNKKV	0	Y	1200	>10000	4898
SW_1268, SW_1200A_UNKKV	342	Y	1200	20000	4887
RCL_4168, RCL_140A	641	Y	140	4000	4698
FUSE_30384, 65_T	10113	Y	65	16000	2077

Pertinent Violations

Device Type	General Location	Violation Type	Comments
Recloser, RCL_4168	Northeast of substation feeder exit at bypass switch 4168	Overload and Short Circuit Rating	140A recloser on NE Cascade Hwy 213 is overloaded at 165.5% (231.7A at 140A rated ampacity). Also the recloser has a short circuit rating violation.

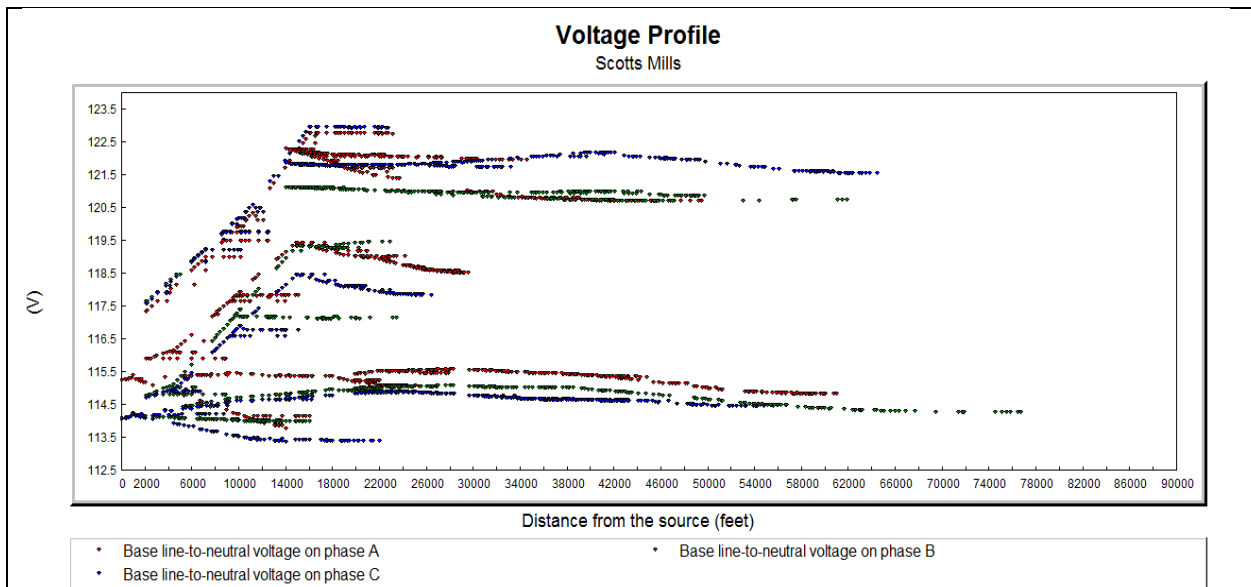


DG INTERCONNECTION – LIGHT LOADING (DG is connected and in service @ unity)

DG Location

DG Location	
Latitude (DD)	Longitude (DD)
45.08308	-122.672222

Feeder Voltage Profile for Light Loading Conditions (DG is connected and in service @ unity)

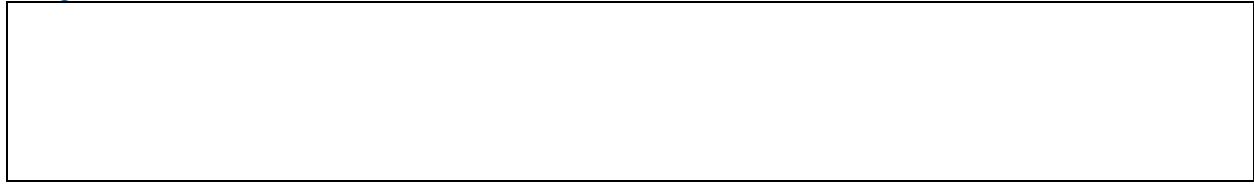


Location	VA			VB			VC		
	Voltage (DG ON)	Voltage (DG OFF)	DELTA%	Voltage (DG ON)	Voltage (DG OFF)	DELTA%	Voltage (DG ON)	Voltage (DG OFF)	DELTA%
Feeder Bus	121.7	121.4	0.2	121.4	121.1	0.2	121.4	121.1	0.2
POI	125.7	120.4	4.4	126.4	121.1	4.4	125.6	120.2	4.5

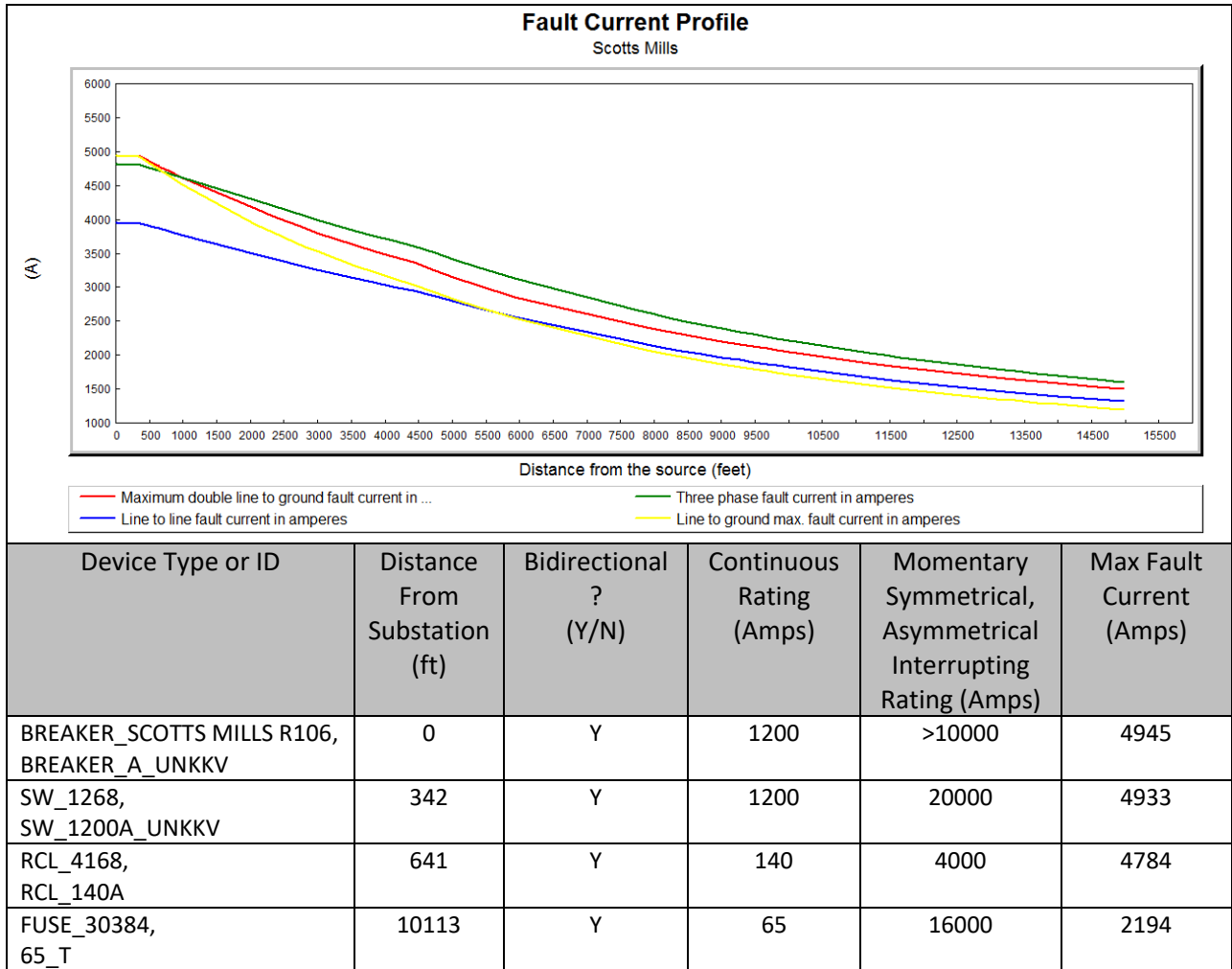
System Backfeed (Record loading at the source side of the proposed DG facilities’ feeder breaker, and at the distribution power transformer).

Location	KW	KVAR
Feeder Breaker	-5180	-850
Transformer (115 or 57kV terminals)	-5150	-622
Substation Source Location	-5150	-622

Transmission Planning Recommendations (If there is backfed onto the transmission system)



Fault Current Profile (DG is connected and in service @ unity)





Pertinent Violations

Device Type	General Location	Violation Type	Comments
Multiple	Mt Angels Scotts Rd and Heinz Rd	Under voltage	Primary conductor and multiple devices on Mt Angels Scotts Rd and Heinz Rd. Worst under voltage at 94.5% (113.4V at 120V Base).
Fuse, FUSE_29217	NE Cascade Hwy 213 at bypass switch 3762	Overload	65T fuse on NE Cascade Hwy 213 at bypass switch 3762 is overloaded at 133.8% (87.0A at 65A rated ampacity).



BASE CASE INFORMATION FOR HEAVY LOADING CONDITIONS

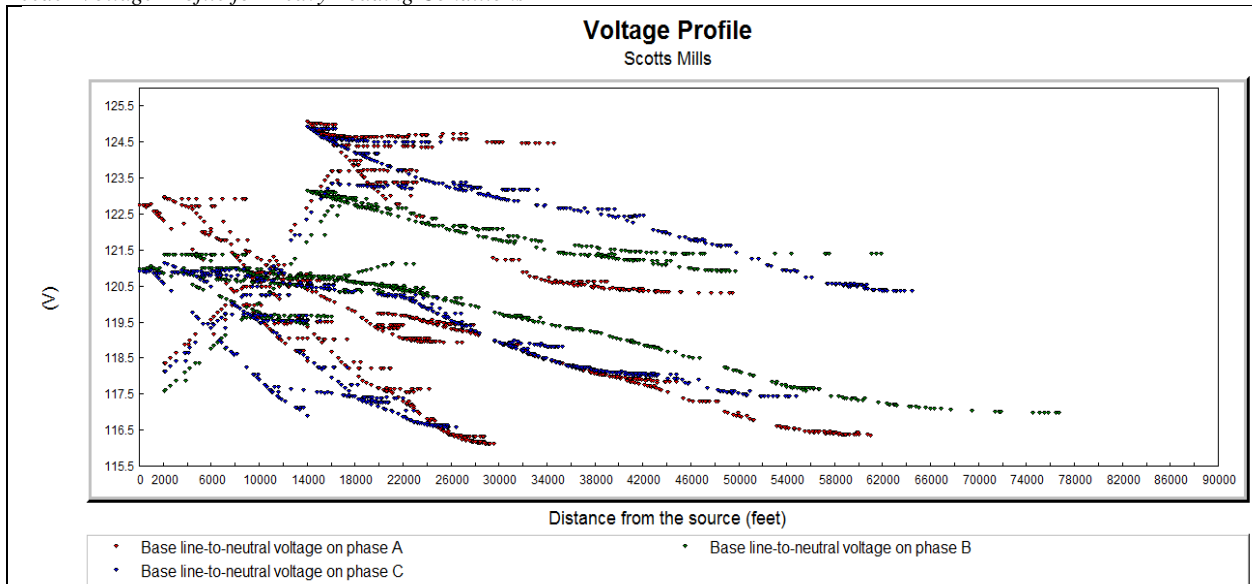
Heavy Loading Information

Simulated Date	7/16/2018
Simulated Hour	16:00

Feeder Loading Information (All feeders served from associated substation transformer)

Feeder Name	Loading (KW)	Loading (KVAR)
Scotts Mills – Scotts Mills 13	5495	310

Feeder Voltage Profile for Heavy Loading Conditions



Location	VA (120V base)	VB (120V base)	VC (120V base)
Feeder Bus	122.7	120.9	120.9
Point of Interconnection	119.0	120.7	118.2



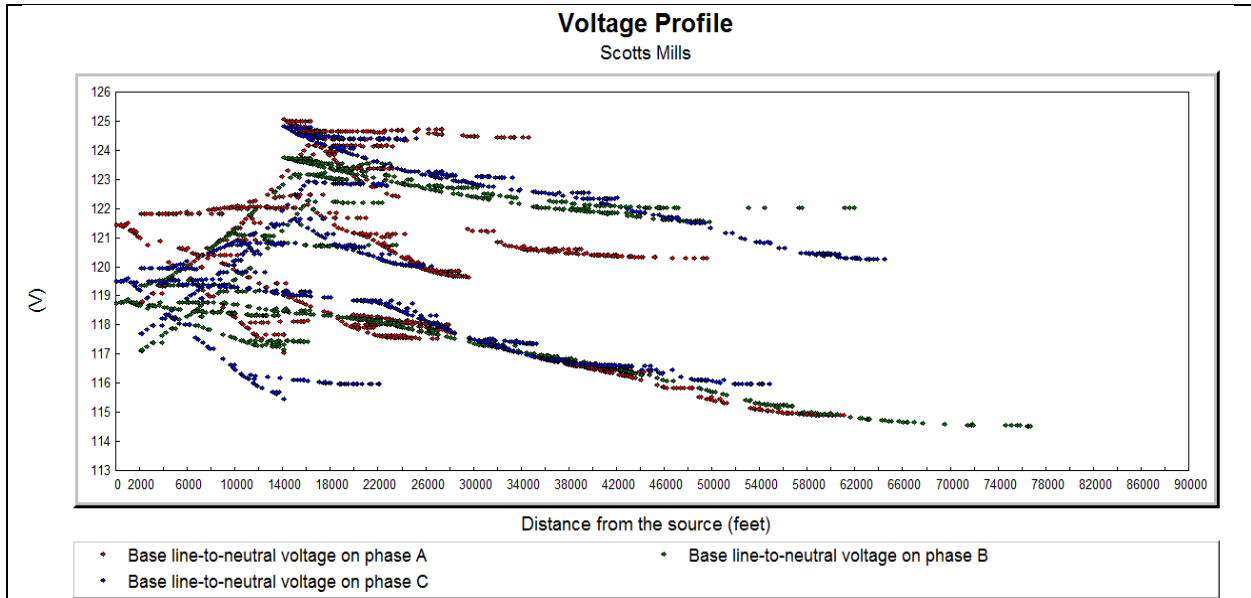
Pertinent Violations

Device Type	General Location	Violation Type	Comments
Recloser, RCL_4168	Northeast of substation feeder exit at bypass switch 4168	Overload and Short Circuit Rating	140A recloser on NE Cascade Hwy 213 is overloaded at 135.9% (190.3A at 140A rated ampacity). Also, the recloser has a short circuit rating violation.
Fuse, FUUSE_29217	Summit Ln and S Rosewood Way intersection	Overload	15T fuse at Summit Ln and S Rosewood Way intersection is overloaded at 148.0% (22.2A at 15A rated ampacity).
Fuse, FUUSE_34504	NE Crooked Finger Rd and Ettlin Loop intersection	Overload	25T fuse at NE Crooked Finger Rd and Ettlin Loop intersection is overloaded at 107.2% (26.8A at 25A rated ampacity).
Fuse, FUUSE_28304	S Rosewood Way and Cascade Hwy 213 intersection	Overload	25T fuse at S Rosewood Way and Cascade Hwy 213 intersection is overloaded at 197.8% (49.4A at 25A rated ampacity).
Fuse, FUUSE_25880	NE Abiqua Rd and Cascade Hwy 213 intersection	Overload	40T fuse at NE Abiqua Rd and Cascade Hwy 213 intersection is overloaded at 112.0% (44.8A at 40A rated ampacity).



DG INTERCONNECTION – HEAVY LOADING

Feeder Voltage Profile for Heavy Loading Conditions (DG is connected and in service @ unity)



Location	VA			VB			VC		
	Voltage (DG ON)	Voltage (DG OFF)	DELTA%	Voltage (DG ON)	Voltage (DG OFF)	DELTA%	Voltage (DG ON)	Voltage (DG OFF)	DELTA%
Feeder Bus	126.2	125.4	0.6	125.2	124.5	0.6	125.1	124.4	0.6
POI	127.2	121.4	4.8	129.5	123.8	4.6	127.2	121.4	4.8

System Backfeed (Record loading at the source side of the proposed DG facilities' feeder breaker, and at the distribution power transformer).

Location	KW	KVAR
Feeder Breaker	-1846	607
Transformer (115 or 57kV terminals)	-1831	644
Substation Source Location	-1831	644



Pertinent Violations

Device Type	General Location	Violation Type	Comments
Fuse, FUSE_29217	NE Cascade Hwy 213 at bypass switch 3762	Overload	65T fuse on NE Cascade Hwy 213 at bypass switch 3762 is overloaded at 113.2% (73.6A at 65A rated ampacity).



SYSTEM IMPROVEMENTS – LIGHT LOADING

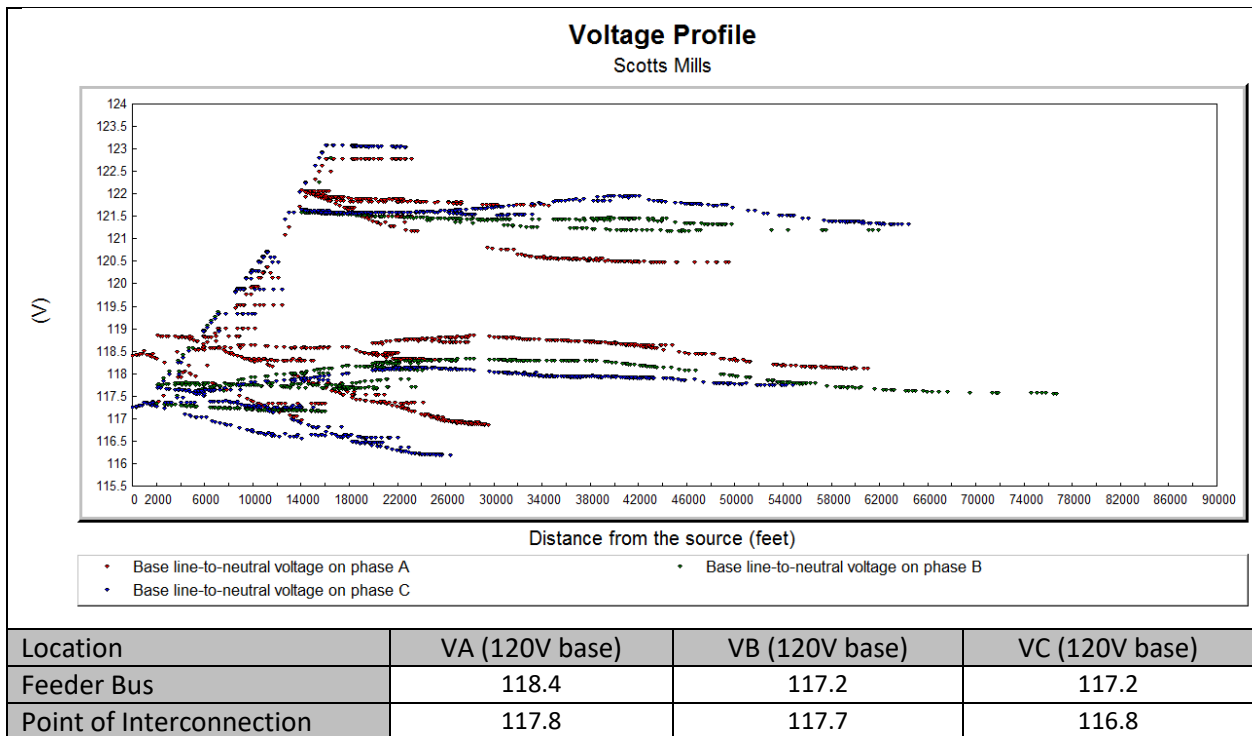
System Improvement Summary

The improvements needed pertaining to this interconnection:

- Increase Scotts Mills Regulator BR1 voltage set point from 120.0V to 121.0V to resolve under voltage
- Replace overloaded 65T (FUSE_29217) on NE Cascade Hwy 213 at bypass switch 3762 with electronic recloser bank
- Add Dynamic VAR support for flicker.
- Install one (1) 300-amp Solid-Blade disconnect cutouts and service metering at DER lateral.

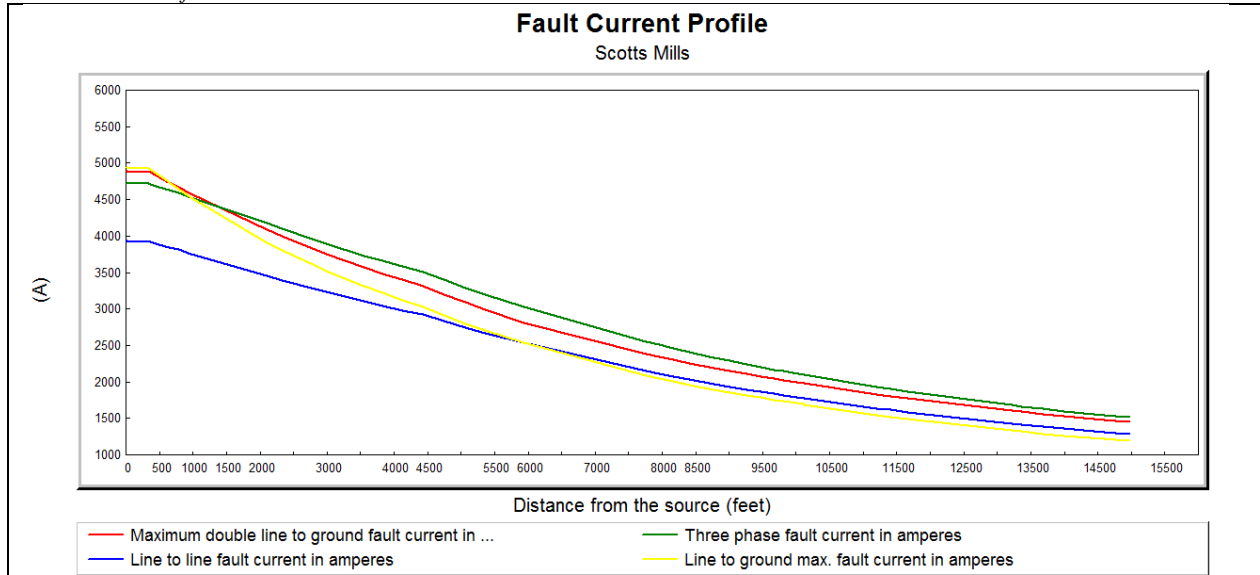
Study was performed in conjunction with SPQ0046 and SPQ0074.

Feeder Voltage Profile for Light Loading Conditions (DG is off)





Fault Current Profile



Device Type or ID	Distance From Substation (ft)	Bidirectional ? (Y/N)	Continuous Rating (Amps)	Momentary Symmetrical, Asymmetrical Interrupting Rating (Amps)	Max Fault Current (Amps)
BREAKER_SCOTTS MILLS R106, BREAKER_A_UNKKV	0	Y	1200	>10000	4939
SW_1268, SW_1200A_UNKKV	342	Y	1200	20000	4927
RCL_4168, RCL_140A	641	Y	140	4000	4737
SPQ0093_MITIGATION1_PEI, RCL_800A	10113	Y	800	12500	2096

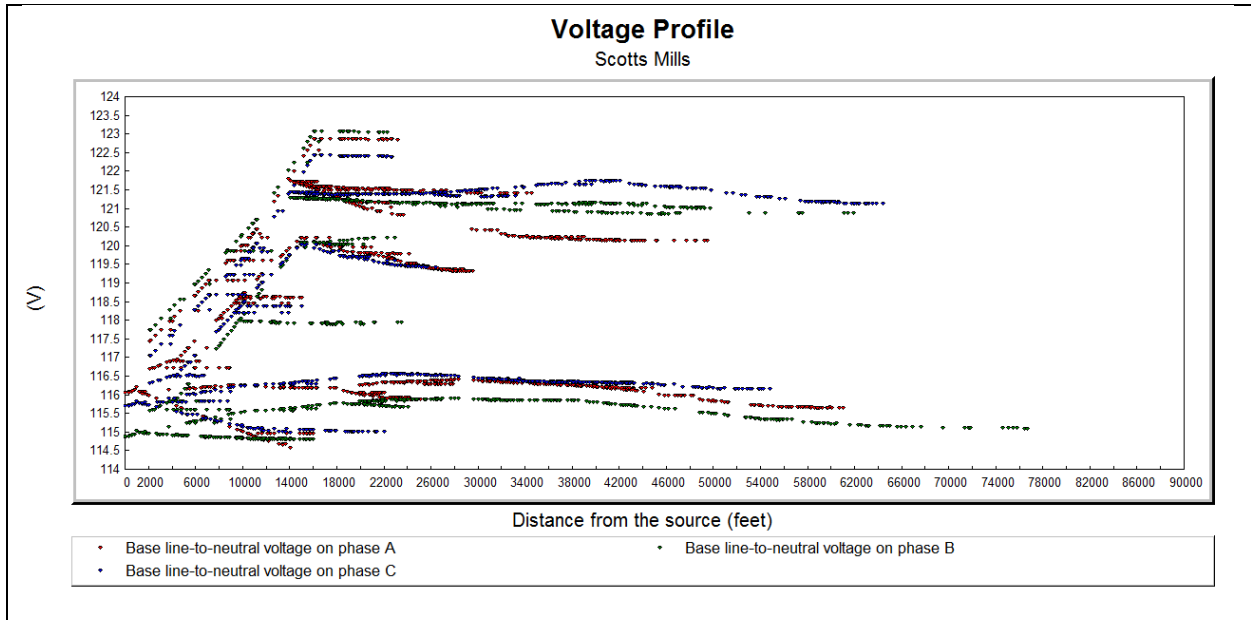
Pertinent Violations

Device Type	General Location	Violation Type	Comments
No violations.			



DG Interconnection – Light Loading (DG is connected and in service @ unity)

Feeder Voltage Profile for Light Loading Conditions (DG is connected and in service @ unity)



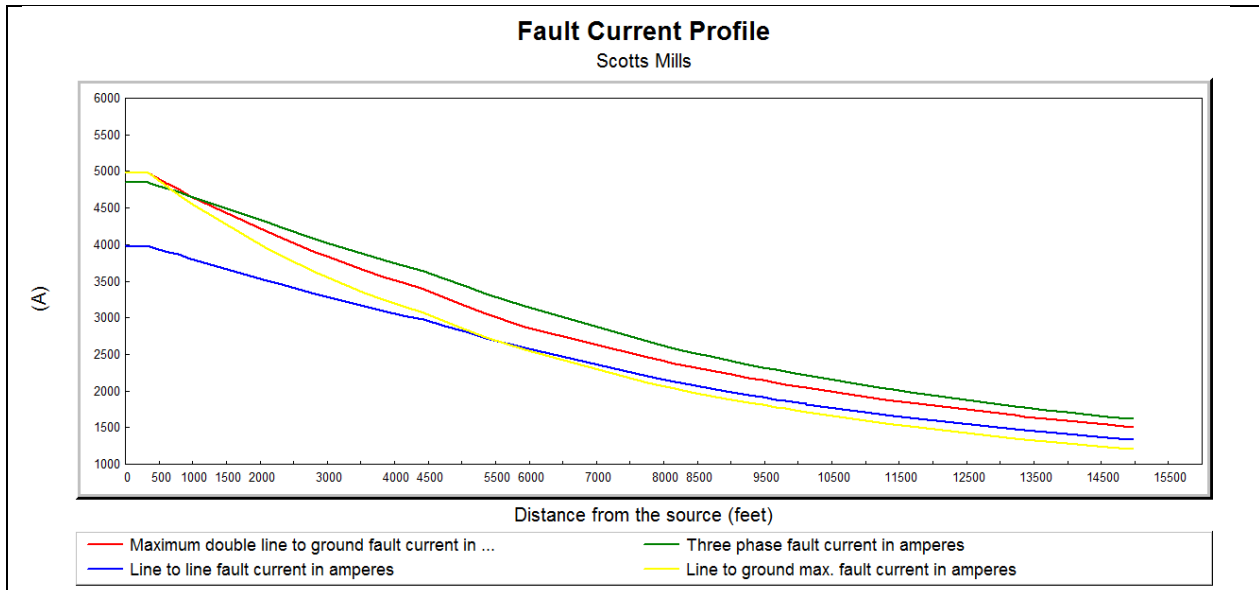
Location	VA			VB			VC		
	Voltage (DG ON)	Voltage (DG OFF)	DELTA%	Voltage (DG ON)	Voltage (DG OFF)	DELTA%	Voltage (DG ON)	Voltage (DG OFF)	DELTA%
Feeder Bus	122.5	122.2	0.2	122.2	121.9	0.2	122.2	121.9	0.2
POI	126.5	121.2	4.4	127.2	121.9	4.3	126.4	121.0	4.5

System Backfeed (Record loading at the source side of the proposed DG facilities’ feeder breaker, and at the distribution power transformer).

Location	KW	KVAR
Feeder Breaker	-5182	-875
Transformer (115 or 57kV terminals)	-5151	-647
Substation Source Location	-5151	-647



Fault Current Profile (DG is connected and in service @ unity)



Device Type or ID	Distance From Substation (ft)	Bidirectional ? (Y/N)	Continuous Rating (Amps)	Momentary Symmetrical, Asymmetrical Interrupting Rating (Amps)	Max Fault Current (Amps)
BREAKER_SCOTTS MILLS R106, BREAKER_A_UNKKV	0	Y	1200	>10000	4986
SW_1268, SW_1200A_UNKKV	342	Y	1200	20000	4974
RCL_4168, RCL_140A	641	Y	140	4000	4824
SPQ0093_MITIGATION1_PEI, RCL_800A	10113	Y	800	12500	2213

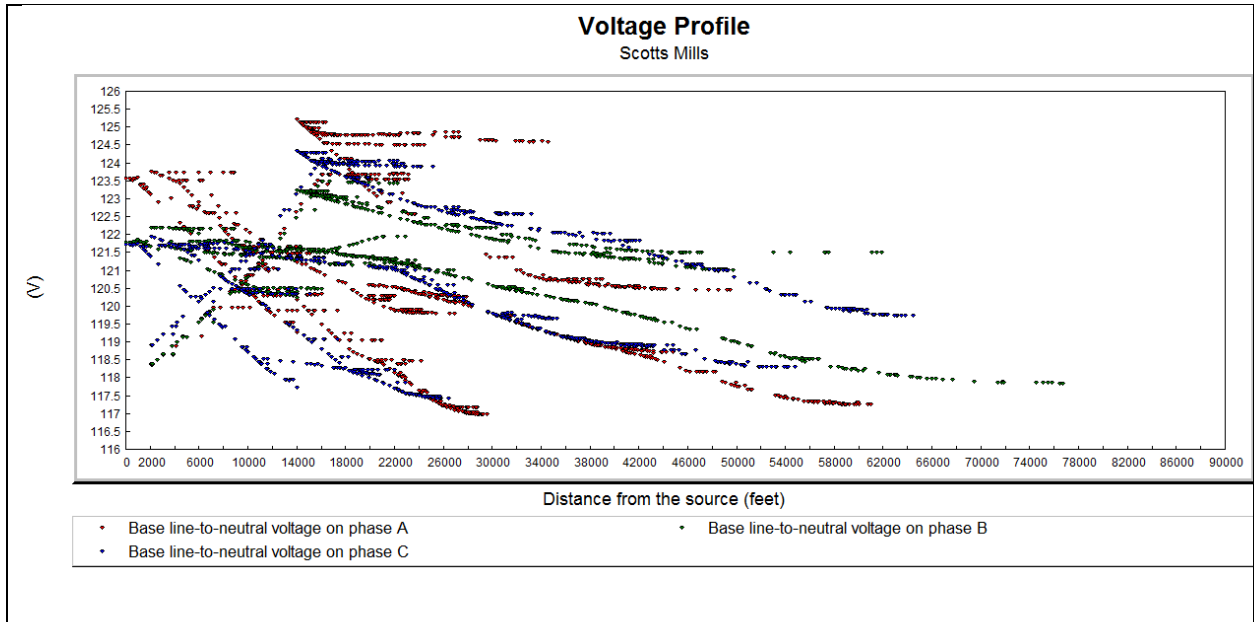
Pertinent Violations

Device Type	General Location	Violation Type	Comments
No violations.			



SYSTEM IMPROVEMENTS – HEAVY LOADING

Feeder Voltage Profile for Heavy Loading Conditions (DG is off)



Location	VA (120V base)	VB (120V base)	VC (120V base)
Feeder Bus	123.5	121.8	121.7
Point of Interconnection	119.8	121.6	119.1

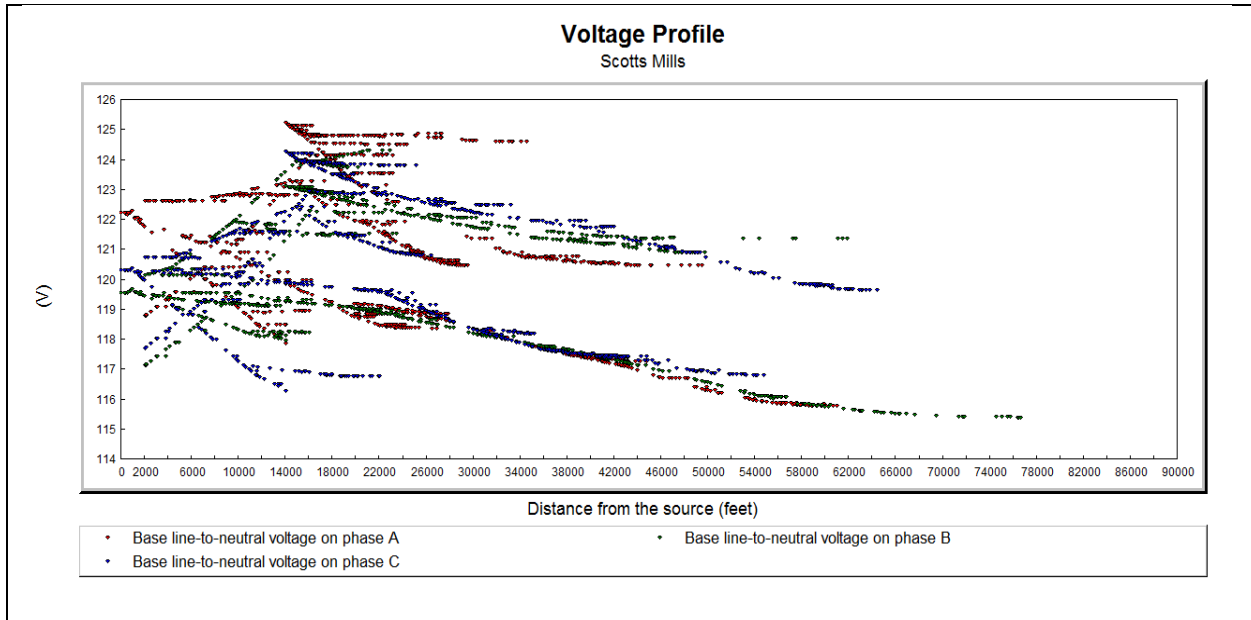
Pertinent Violations

Device Type	General Location	Violation Type	Comments
No violations.			



DG Interconnection – Heavy Loading (DG is connected and in service @ unity)

Feeder Voltage Profile for Heavy Loading Conditions (DG is connected and in service @ unity)



Location	VA			VB			VC		
	Voltage (DG ON)	Voltage (DG OFF)	DELTA%	Voltage (DG ON)	Voltage (DG OFF)	DELTA%	Voltage (DG ON)	Voltage (DG OFF)	DELTA%
Feeder Bus	127.0	126.2	0.6	125.2	124.5	0.6	125.1	124.4	0.6
POI	128.1	122.2	4.8	129.5	123.8	4.6	127.2	121.4	4.8

System Backfeed (Record loading at the source side of the proposed DG facilities’ feeder breaker, and at the distribution power transformer).

Location	KW	KVAR
Feeder Breaker	-1848	589
Transformer (115 or 57kV terminals)	-1833	626
Substation Source Location	-1833	626

Pertinent Violations

Device Type	General Location	Violation Type	Comments
No violations.			



APPENDIX A: LINKS TO SUPPORTING DOCUMENTATION

[IEEE](#) – (Reference IEEE 1547-2003)

[Job Aid 1](#) – Minimum Daylight Load

[Job Aid 2](#) – Setting up CYME for an Interconnection Study

[Job Aid 3](#) – Finding Proposed Interconnection Locations

[Job Aid 4](#) – Conducting a CYME Interconnection SI Study

[Power Quality Guidelines](#) – LD19100

[Regulator and LTC Settings](#) – Substation

[Regulator Settings](#) – Feeder

[Small Power \(QF\) Interconnection Queue](#)

[Substation Highside Source Impedances](#)

[System Impact Schedule](#)



APPENDIX B: EQUIPMENT RATINGS AND STANDARDS

Cutouts

Polymeric Cutout Specifications					
Cutout Usage	PGE Part Number	Cutout Type	kV Rating	Amp Rating	
				Continuous	Asymmetrical Interrupting
General	40102	Open dropout	15	100	16,000
Special application	39478			200	12,000
	90006289	Solid blade		300	—

15-kV Solid Blade Cutout Ratings				
PGE Part Number	Voltage Rating (kV)		Current Rating (amps)	
	Nominal	Maximum	Continuous	Momentary (asymmetrical)
90006289	14.4	15.0	300	12,000

Table 10: 15-kV Solid Blade Cutout Ratings

Gang Operated Switches

15-kV Gang-Operated Switch Fault Ratings				
PGE Part Number	Manufacturer	Peak Withstand (amps, rms, 10 cycles)	Momentary, Symmetrical (amps, rms, three seconds)	Fault Closing (peak amps) ¹
03586	S&C Electric Company Omni-Rupter ²	65,000	20,000	42,000
	Inertia Engineering LineBOSS	51,000	32,000	30,000
03587	Unassembled S&C Electric Company Alduti-Rupter	40,000	25,000	20,000

Switches

15-kV Disconnect Switch Ratings				
PGE Part Number	Voltage Rating (kV)		Current Rating (amps)	
	Nominal	Maximum	Continuous	Momentary
03582	15	15.5	1200	61,000

Table 9: 15-kV Disconnect Switch Ratings



Reclosers

Types of Reclosers and Corresponding PGE Part Numbers						
PGE Part Number	Phase	Setting	Continuous Rating	Type	Symmetrical Amps	
03398	Single	1A3C	50	L ¹	3000	
03399						
03401		2A2D	70		4000	
03405			100			
03406			140			
39135			50	3000		
03402			70	4200		
39130			1A3C	V4L		6000
03403		2A2D	100			
39131		1A3C	140			
03408		2A2D				
39132		1A3C	200			
03410		2A2D				
39133		1A3C	280			
03411		2A2D				
39134		1A3C				
—		Three	Electronic allows a variety of curves	560 and 800 maximum	WE	10,000
03414				800 maximum	VWE	12,000
39756	NOVA				12,500	
40242						

1. The L-type recloser is no longer purchased by PGE; it is here for reference only.

Switchgear

Switchgear Design Ratings	
Design	Rating
Maximum voltage	15.5 kV
Power frequency	60 Hz
Lightning impulse withstand voltage	95 kV
Power frequency withstand voltage	35 kV
Continuous current	1200 A
Momentary asymmetrical current	40 kA
Fault-closing asymmetrical current	40 kA

Table 1: Switchgear Design Ratings



600-A, Pad-Mounted Switchgear Configurations				
PGE Part Number	Number of Switch Ways	Number of Fused Ways	Switchgear Momentary Fault Rating (kA, asymmetrical)	Unit Momentary Fault Rating (kA, symmetrical)
39686	3	1	40	14
39687	2	2		

Table 5: 600-A, Pad-Mounted Switchgear Configurations

900-A, Pad-Mounted Switchgear Configurations					
PGE Part Number	Number of Switch Ways	Number of Fault Interrupter Ways	Switch Way Continuous Rating (amp)	Fault Interrupter Way Continuous Rating (amp)	Unit Fault Rating (kA, symmetrical)
90008072	2	2	900	600	25
90008073	3	1		—	
90008074	4	—		—	

Table 7: 900-A, Pad-Mounted Switchgear Configurations

1200-A, Pad-Mounted Switchgear Configurations				
PGE Part Number	Number of Switch Ways	Number of Fused Ways	Switchgear Momentary Fault Rating (kA, asymmetrical)	Unit Momentary Fault Rating (kA, symmetrical)
01433	4	—	40	35
01434	2	2		14
01435	3	1		
40050 ¹	4	—	61	35
40051 ¹	3	1		

1. This style is currently only used for Intel sites that require a higher fault rating.

Table 3: 1200-A, Pad-Mounted Switchgear Configurations



600-A, Submersible Switchgear Ratings						
PGE Part Number	Number of Switch Ways	Number of Fault Interrupter Ways	Unit Continuous Rating (amp)	Switchgear Continuous Rating (amp)	Fault Interrupter Continuous Rating (amp)	Unit Fault Rating (kA, symmetrical)
01425	2	2	600	600	200	12.5
01427	3					
01428		3				

Table 10: 600-A, Submersible Switchgear Ratings

900-A, Submersible Switchgear Dimensions					
Unit Fault Rating (kA, symmetrical)	Total Number of Ways	Tank Width ¹ (inch)	Tank Depth ² (inch)	Bushing Height (inch)	Total Height (inch)
12.5	4	65.4375	40.0625	17.5	26.625
25			40.25	28.75	33
12.5	5	80.4375	40.0625	17.5	26.625
25			40.25	28.75	33
12.5	6	95.4375	40.0625	17.5	26.625
25			40.25	28.75	33

1. Termination side of tank.
2. Depth includes controller enclosure but not bushings.

Table 12: 900-A, Submersible Switchgear Dimensions

IEEE Voltage Range/Clearing Times Table

Voltage range (% of base voltage ^a)	Clearing time(s) ^b
V < 50	0.16
50 ≤ V < 88	2.00
110 < V < 120	1.00
V ≥ 120	0.16

^aBase voltages are the nominal system voltages stated in ANSI C84.1-1995, Table 1.

^bDR ≤ 30 kW, maximum clearing times; DR > 30kW, default clearing times.

The voltage deviation when the DG is off line or in service must be within Voltage Guideline limits from 88% to 110% of the nominal voltage at the point of interconnection and the substation bus. The voltage guideline set by IEEE-1547 requires DG to disconnect from the grid or clear at the set time shown.

Exhibit 4

PGE's Facility Study Revised

August 13, 2019

Portland General Electric



Facility Study

Revised

Interconnection Request:

Marquam Creek Solar – 2.00 MWAC

SPQ0093

August 13, 2019



Table of Contents

1. Introduction	3
2. Facility Study Scope.....	3
3. Facility Study Assumptions	4
4. Facility Study Overview	4
5. Cost Estimate.....	6
6. Schedule	6
7. Higher Queued Projects.....	7



1. Introduction

On July 24, 2017, Portland General Electric (PGE) received a completed Small Generator Interconnection Request. The Interconnection Request seeks to interconnect a 2.00 MWAC solar facility located in Clackamas, Oregon at GPS coordinates 45.08308, -122.672222. The interconnection point will be on PGE's Scotts Mills 13 distribution feeder connected to the Scotts Mills substation.

As set forth in the Oregon Administrative Rules 860-082-0015(29), PGE has assigned queue number SPQ0093 to the Interconnection Request.

On May 17, 2019, 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 Qualifying 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 2.00 MWAC generation facility. PGE in the System Impact Study provided 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.
- 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:

- 2.00 MWAC is assumed to be the peak output. The generation is assumed to be summer peaking.
- The Point of Interconnection will be on PGE's Scotts Mills 13 distribution feeder.
- Delivery Voltage at the point of interconnection is assumed to 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.
- 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.
- The Interconnection Customer will acquire all necessary distribution line easements, including easements for PGE's owned underground cable route for the new service.
- This report is based on information available at the time of the study July 12, 2019.

4. Facility Study Overview

The System Impact Study identified the following Interconnection Requirements.

- Replace 65T fuse with an electronic recloser
- Modify the voltage set points on the Scotts Mills BR1 voltage regulator from 120.0V to 121.0V
- Interconnection Customer must use dynamic reactive current support
- Install a new primary service and metering package
- Install transfer trip via mirror bits protocol over fiber optic cable
- Install an RTAC to expand the communications channels

During the Facility Study SPQ0074, a higher queued project, withdrew from the interconnection process. The withdraw has caused a reconductor of 2.7 miles to be placed on SPQ0093.

The reconductor will replace the existing overhead 4 CU conductor with 4/0 ACC along Highway 213 from Wagon Rd to Marquam Creek Rd.



The scope of work detailed below outlines the requirements and 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.

On the distribution system PGE will install and maintain 4/0 ACC conductor along Highway 213 and will replace the 65T fuse with an electronic recloser.

In the Scotts Mills substation PGE will modify the voltage set points on the BR1 voltage regulator. Additionally, PGE will install an RTAC and complete fiber terminations.

A transfer trip protection scheme will be engineered, installed and maintained by PGE. A fiber optic cable will run from the Scotts Mills substation to the point of interconnection along the existing distribution route. PGE's preferred method for transfer trip is SEL Mirror Bits Protocol. PGE will provide the settings for the Interconnection Customers relays prior to construction.

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 need to purchase and install a small vault along the same path as the conduit. The vault needs to be located between the outside fence of the generation facility and the riser pole. The vault will contain laterals, provided by PGE, that can be used as an isolation point for PGE crews. Vault specifications will be provided during the engineering of the new primary service.

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 need to provide a non-energized communications cabinet to which the fiber optic cable and transfer trip devices can reside. The Interconnection Customer will be responsible for purchasing and installing the relays for transfer trip. Prior to testing, a copy of the setting must be provided to PGE for review.



The Interconnection Customer will be required to use dynamic reactive current support to mitigate voltage flicker on the feeder. The cost associated with dynamic reactive current support will be borne by the Interconnection Customer and is not included in PGE’s cost Estimate.

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	\$593,500.00
Protection Requirements	\$69,600.00
Communications Requirements	\$202,837.00
New Service Metering	\$30,000.00
Total	\$895,937.00

A payment schedule will be set forth and agreed to in the Interconnection Agreement.

6. 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 Interconnection of Marquam Creek Solar Solar is dependent on one higher queued project completing their interconnection requirements. Those prerequisite requirements are listed below:

Queue Position	Prerequisite Interconnection Requirements
SPQ0046	Inside the substation PGE will install voltage transformers on the feeder, feeder breaker, circuit switcher, transformer protection upgrades and high side voltage transformer

Proposed Schedule

Executed Interconnection Agreement	9/4/2019
Engineering Design Starts	10/25/2019
Engineering Design Complete	5/29/2020
PGE Construction Scheduled	6/26/2020



Interconnection Customer Switchgear Installed/Inspected	12/18/2020
Interconnection Facilities Complete	1/15/2021
In-Service Date	1/29/2021

PGE does not guarantee completion of any project on a targeted date as the schedule is dependent on several variables, including but not limited to, construction of other potential interconnection projects and payment milestones being met by the Interconnection customer.

7. Higher Queued Projects

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 Scotts Mills 13 feeder.

Queue Position	AC Nameplate Rating	Status	Estimated In-Service Date
SPQ0046	2.5	Facilities Study	TBD

Exhibit 5

**PGE Emails - September 10, 2019
and October 17, 2019**

Marquam Creek Solar - Higher Queued Project Withdrew

Small Power Production <Small.PowerProduction@pgn.com>
To: Hunter Strader <hunter@greenkeysolar.com>

Tue, Sep 10, 2019 at 3:11 PM

Hunter,

PGE was slated to provide Marquam Creek an interconnection agreement tomorrow however today SPQ0046 on Scotts Mills-13 feeder withdrew from the interconnection queue. SPQ0046 had a higher queue position than Marquam Creek Solar. Unfortunately this change will necessitate a restudy of Marquam Creek. Attached is a copy of the redacted SIS for SPQ0046.

Please let PGE know if you would like to continue with the restudy within the next 5 business days. If you elect to proceed PGE will kick off the System Impact Study.

Let me know if you have any questions.


Thank you,

Jason Zappe



Customer Generation Specialist • 503-464-7264 • 503-464-8300

PortlandGeneral.com • Follow us on social @PortlandGeneral

 **SPQ0046SIS.pdf**
1149K

Marquam Creek Solar - Higher Queued Project Withdrew

Small Power Production <Small.PowerProduction@pgn.com>
To: Hunter Strader <hunter@greenkeysolar.com>
Cc: Small Power Production <Small.PowerProduction@pgn.com>

Thu, Oct 17, 2019 at 10:54 AM

Hunter,

PGE did not receive a response on the restudy for Marquam Creek. PGE will be moving forward with the restudy to ensure we provide you with accurate interconnection requirements. The restudy will be begin immediately and the results will be provided within 60 business days.

Please let us know if you have any questions.

Thank you,

Jason Zappe • Customer Generation Specialist • 503-464-7264

[Quoted text hidden]

Exhibit 6

PGE System Impact Re-Study

January 21, 2020

Portland General Electric



System Impact Study Revision

Interconnection Request:

Marquam Creek Solar – 2.00 MWAC

SPQ0093

1/21/2020

PGE System Impact Study subject to change- Not for construction



Table of Contents

1. Introduction.....	3
2. Feasibility Study Scope	3
3. Feasibility Study Assumptions	4
4. Feasibility Study Interconnection Requirements	5
Distribution System Modifications	5
Protection Requirements	5
5. Cost Estimate	7
6. Schedule	7



1. Introduction

On July 24, 2017, Portland General Electric (PGE) received a completed Small Generator Interconnection Request for Marquam Creek Solar. The Interconnection Request seeks to interconnect a 2.00 MWAC solar facility located in Clackamas, Oregon at GPS coordinates 45.08308, -122.672222. The interconnection point will be on PGE's Scotts Mills-13 kV distribution feeder connected to the Scotts Mills substation.

As set forth in the Oregon Administrative Rules 860-082-015(29), PGE has assigned queue number SPQ0093 to the Interconnection Request.

On February 1, 2019, 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 Qualifying 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: December 16, 2019 (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.
- Marquam Creek Solar was modeled at its maximum capability of 2.00 MWac.
- The Point of Interconnection will be on PGE's Scotts Mills-13 kV distribution feeder at GPS coordinates 45.08308, -122.672222.
- 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 revenue meter.
- 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 engineering design (conducted after an Interconnection Agreement is executed and funded) the path must be modified, then it may result in additional cost and timing delays for the Interconnection Customer.
- Generator tripping may be required under outages, emergency or abnormal system conditions.
- 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 stated in 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 December 16, 2019.

4. System Impact Study Interconnection Requirements

A System Impact Study was performed for SPQ0093. During the study equipment was monitored for voltage, loading, and short circuit violations. Based on the study results, the following are the distribution related impacts pertaining to this interconnection request.

Distribution System Modifications

The analysis showed the interconnection of SPQ0093 will overload an existing 65T fuse #30384 located on NE Cascade Hwy 213, approximately 300 feet north of Marquam Canby Rd. To resolve this, the fuse will need be replaced with a 100T fuse.

Additionally, a hydraulic 140A recloser #4168, near the substation, will need to be replaced with an electronic recloser. The recloser upgrade is required so the recloser can properly function with reverse power flow caused by the interconnection.

Regulator for Scotts Mills substation transformer does not compensate for overvoltage in the heavy load base case scenario, so the settings must be adjusted. To mitigate this issue and any overvoltage that would occur from SPQ0093 interconnection, the voltage set point should be decreased from 120.0V to 118.0V.

The analysis determined during light and heavy load conditions the generating facility may cause voltage flicker issues on the feeder. The Interconnection Customer will be required to use dynamic reactive current support to mitigate this concern.

The cost associated with dynamic reactive current support will be borne by the Interconnection Customer and is not included in PGE's cost estimate.

To properly service the generating facility, the installation of a new primary service and metering package will be needed

Protection Requirements

The daytime minimum load on the Scotts Mills-13 kV feeder is 2.05 MW which occurred on 5/29/2019. Additionally, the daytime minimum load on the Scotts Mills substation transformer is also 2.05 MW which occurred on 5/29/2019. The amount of installed and proposed generation on the feeder when SPQ0093 is included is 2.261 MW. The Scotts Mills substation transformer is rated at 9.4.



Under the conditions outlined above the generation can carry the entire Scotts Mills substation transformer load and will cause backflow into the transmission system. This causes the potential for the following condition to occur.

When there is ground fault on the high side of the substation transformer, the line relays will trip the line breakers leaving the substation primary without a ground reference. The DER back-feeding to the primary will create an overvoltage condition on the unfaulted phases of up to 173% of normal phase-ground voltage. Until the fault is cleared and the back feed interrupted, the arresters on the un-faulted phases will be exposed to this overvoltage, and will continuously conduct, leading to thermal runaway and arrester failure. The overvoltage condition can also damage the transformer and the line insulators. At low DER penetration the relatively large stranded load facilitates rapid cessation of the DER; at higher penetration levels the DER removes itself increasingly slowly.

There are two approaches to address this fault induced overvoltage condition:

1. Prevent it by making the substation transformer appear to the transmission system as an effectively grounded source; this would require replacement of the substation transformer with a different configuration or in the installation of a grounding bank.
2. Rapidly detect the overvoltage condition and remove the transformer as a source; this is referred to as 3V0 sensing or as 59N protection.

The first approach is preferable, but considerably more expensive than the second approach. The first approach may be implemented during substation rebuilds; the second approach is how existing substations are being adapted for high penetrations of DER.

Once the DER is separated from the transmission system, it is essential that the DER be tripped to allow the transmission system to reenergize the distribution system without risk of closing in out-of-phase to still energized portions.

To trip the DER the follow is required:

- Install 13-kV voltage transformers
- Replace the feeder breaker and relay
- Install a circuit switcher
- Replace the substation transformer relays with dual SEL-487E relay panels
- Install 60-kV voltage transformers
- Transfer trip to the DER via SEL Mirror Bits



Transfer trip requires running a fiber optic line from the Scotts Mills Substation to the point of interconnection which is approximately 2.7 miles.

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 (Equipment outside the substation)	\$108,116.00
Protection Requirements (Equipment Inside the Substation)	\$789,100.00
Communications Requirements (Fiber)	\$202,837.00
Total	\$1,100,053.00

6. Schedule

PGE estimates it will require approximately 24 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.

The Interconnection of SPQ0093 is not dependent on any higher queued projects completing their interconnection requirements.

Queue Position	Prerequisite Interconnection Requirements
N/A	

7. Higher Queued Projects



All active higher queued generation Interconnection Requests were 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 Scotts Mills-13 kV feeder.

Queue Position	AC Nameplate Rating	Status	Estimated In-Service Date
N/A			

8. Attachment A- Detailed System Impact Study Report (attached below)

SYSTEM IMPACT STUDY FOR SPQ0093 (Revision 2)

Marquam Creek Solar

Prepared by

Cameron Van Leuven (POWER Engineers, Inc.)

Updated by Josh Davis (Portland General Electric)

SYSTEM IMPACT STUDY (SIS) FOR DISTRIBUTION LINES AND EQUIPMENT

Contents

- INTERCONNECTION INFORMATION..... 4
 - Customer Information 4
 - Interconnection Summary 4
- INTERCONNECTION REQUESTS ASSOCIATED WITH THIS SUBSTATION..... 6
- BASE CASE INFORMATION FOR LIGHT LOADING CONDITIONS 7
 - Light Loading Information..... 7
 - Feeder Loading Information 7
 - Feeder Voltage Profile for Light Loading Conditions 7
 - Fault Current Profile..... 8
 - Pertinent Violations 8
- DG INTERCONNECTION – LIGHT LOADING 9
 - DG Location..... 9
 - Feeder Voltage Profile for Light Loading Conditions 9
 - System Backfeed 9
 - Transmission Planning Recommendations 10
 - Fault Current Profile..... 10
- BASE CASE INFORMATION FOR HEAVY LOADING CONDITIONS..... 12
 - Heavy Loading Information..... 12
 - Feeder Loading Information 12
 - Feeder Voltage Profile for Heavy Loading Conditions 12
 - Pertinent Violations 13
- DG INTERCONNECTION – HEAVY LOADING 14
 - Feeder Voltage Profile for Heavy Loading Conditions 14
 - System Backfeed 14
 - Pertinent Violations 15
- SYSTEM IMPROVEMENTS – LIGHT LOADING 16
 - System Improvement Summary 16
 - Feeder Voltage Profile for Light Loading Conditions 16
 - Pertinent Violations 17
 - DG Interconnection – Light Loading 18
 - Feeder Voltage Profile for Light Loading Conditions 18
 - System Backfeed 18

SYSTEM IMPACT STUDY (SIS) FOR DISTRIBUTION LINES AND EQUIPMENT

Fault Current Profile..... 19

Pertinent Violations 19

SYSTEM IMPROVEMENTS – HEAVY LOADING..... 20

 Feeder Voltage Profile for Heavy Loading Conditions 20

 Pertinent Violations 20

 DG Interconnection – Heavy Loading 21

 Feeder Voltage Profile for Heavy Loading Conditions 21

 System Backfeed 21

 Pertinent Violations 22

APPENDIX A: LINKS TO SUPPORTING DOCUMENTATION 23

APPENDIX B: EQUIPMENT RATINGS AND STANDARDS..... 24

 Cutouts..... 24

 Gang Operated Switches..... 24

 Reclosers 25

 IEEE Voltage Range/Clearing Times Table 27

SYSTEM IMPACT STUDY (SIS) FOR DISTRIBUTION LINES AND EQUIPMENT

INTERCONNECTION INFORMATION

Customer Information

Queue Position	SPQ0093
Applicant Name	Marquam Creek Solar
System Impact Study Commitment Date	10/22/2019
Size of Proposed Facility (MW)	2.0 MW AC
Coordinates or Facility Location	45.08308, -122.672222
Inverter Type(s)	SMA SC-2200-US (or equivalent)
Engineer Performing SIS	Cameron Van Leuven (POWER Engineers, Inc) Revised by Josh Davis (Portland General Electric)
Accounting Work Order (AWO)	1000008199

Interconnection Summary

System Impact Study was performed for Marquam Creek Solar on the Scotts Mills Substation, feeder Scotts Mills - Scotts Mills 13. The system was simulated and analyzed for voltage, loading, and short circuit violations.

The improvements needed pertaining to this interconnection:

- Replace 140A Recloser 4168 with 800A electronic recloser which function properly with reverse power flow. Interconnection potentially causes reverse power flow in the light load scenario.
- Replace overloaded 65T (FUSE_ 30384) on NE Cascade Hwy 213 at bypass switch 3762 with 100T fuse bank.
- Add Dynamic VAR support for voltage flicker.
- Install one (1) 300-amp Solid-Blade disconnect cutouts and service metering at DER lateral.

Regulator for Scotts Mills BR1 does not compensate for overvoltage in the heavy load base case scenario, so the settings must be adjusted. To mitigate this issue and any overvoltage that would occur from SPQ0093 interconnection, the voltage set point should be decreased from 120.0V to 118.0V.

Interconnection of SPQ0093 causes at most 4.0% voltage flicker. Therefore, dynamic VAR support is required to mitigate voltage flicker.

SYSTEM IMPACT STUDY (SIS) FOR DISTRIBUTION LINES AND EQUIPMENT

Distribution Line Related Upgrades (Pertaining to this Interconnection)

Description	Estimated Cost
1 – 800A Electronic Viper Recloser (with 20% contingency)	\$77,053
1 – 100T Fuse Bank Installation (with 20% contingency)	\$1,063
New Primary Service and Metering Package	\$30,000

Total Estimated Distribution Line Cost	\$108,116
---	------------------

SYSTEM IMPACT STUDY (SIS) FOR DISTRIBUTION LINES AND EQUIPMENT

INTERCONNECTION REQUESTS ASSOCIATED WITH THIS SUBSTATION

Queue Pos #	Name	Feeder Name	Xfmr Pos #	GPS Coordinates	DG Size (MW AC)	Status
SPQ0037		Scotts Mills-Scotts Mills 13	BR1	N/A	2.2	Withdrawn
SPQ0046		Scotts Mills-Scotts Mills 13	BR1	N/A	2.5	Withdrawn
SPQ0054		Scotts Mills-Scotts Mills 13	BR1	N/A	2	Withdrawn
SPQ0073		Scotts Mills-Scotts Mills 13	BR1	N/A	2.97	Withdrawn
SPQ0074		Scotts Mills-Scotts Mills 13	BR1	N/A	2.97	Withdrawn
SPQ0093	Marquam Creek Solar	Scotts Mills-Scotts Mills 13	BR1	45.08308, -122.672393	2	System Impact Study
SPQ0156		Scotts Mills-Scotts Mills 13	BR1	N/A	2.5	Withdrawn

SYSTEM IMPACT STUDY (SIS) FOR DISTRIBUTION LINES AND EQUIPMENT

BASE CASE INFORMATION FOR LIGHT LOADING CONDITIONS

Substation Name	Scotts Mills
Interconnecting Feeder Name	Scotts Mills - Scotts Mills 13
Substation Transformer Position # (e.g. WR1, BR1)	BR1

Light Loading Information

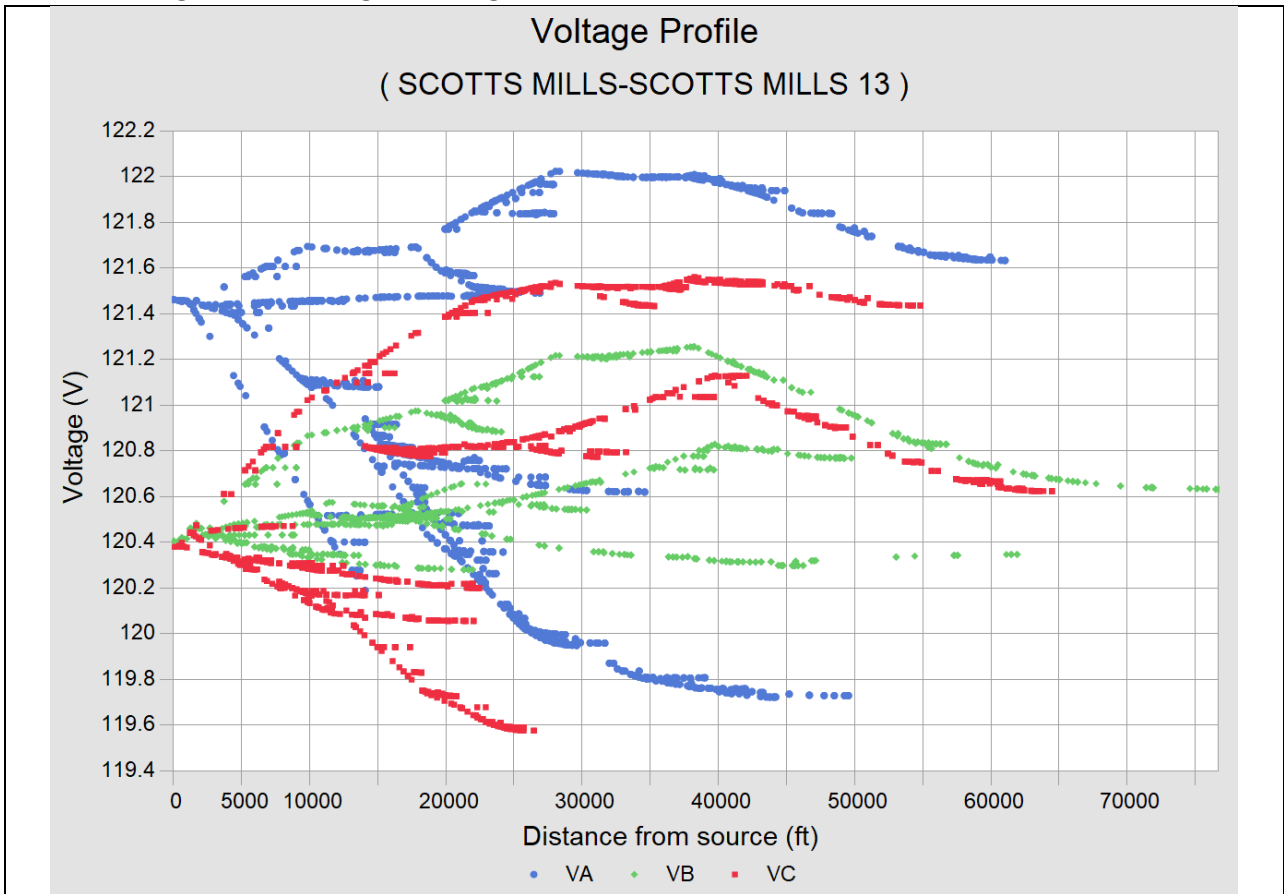
Simulated Date	5/30/2019
Simulated Hour	16:00

Feeder Loading Information

Feeder Name	Transformer Position	Loading (KW)	Loading (KVAR)
Scotts Mills - Scotts Mills 13	BR1	931	-680

Note: 50% Consumption load is used for the load allocation and analysis below. It is determined from measured minimum load by separating consumption load from solar photovoltaic generation, reducing consumption load by half, and then adding back the solar photovoltaic generation. It is effectively the minimum load scenario where half the consumption occurs with full solar photovoltaic generation.

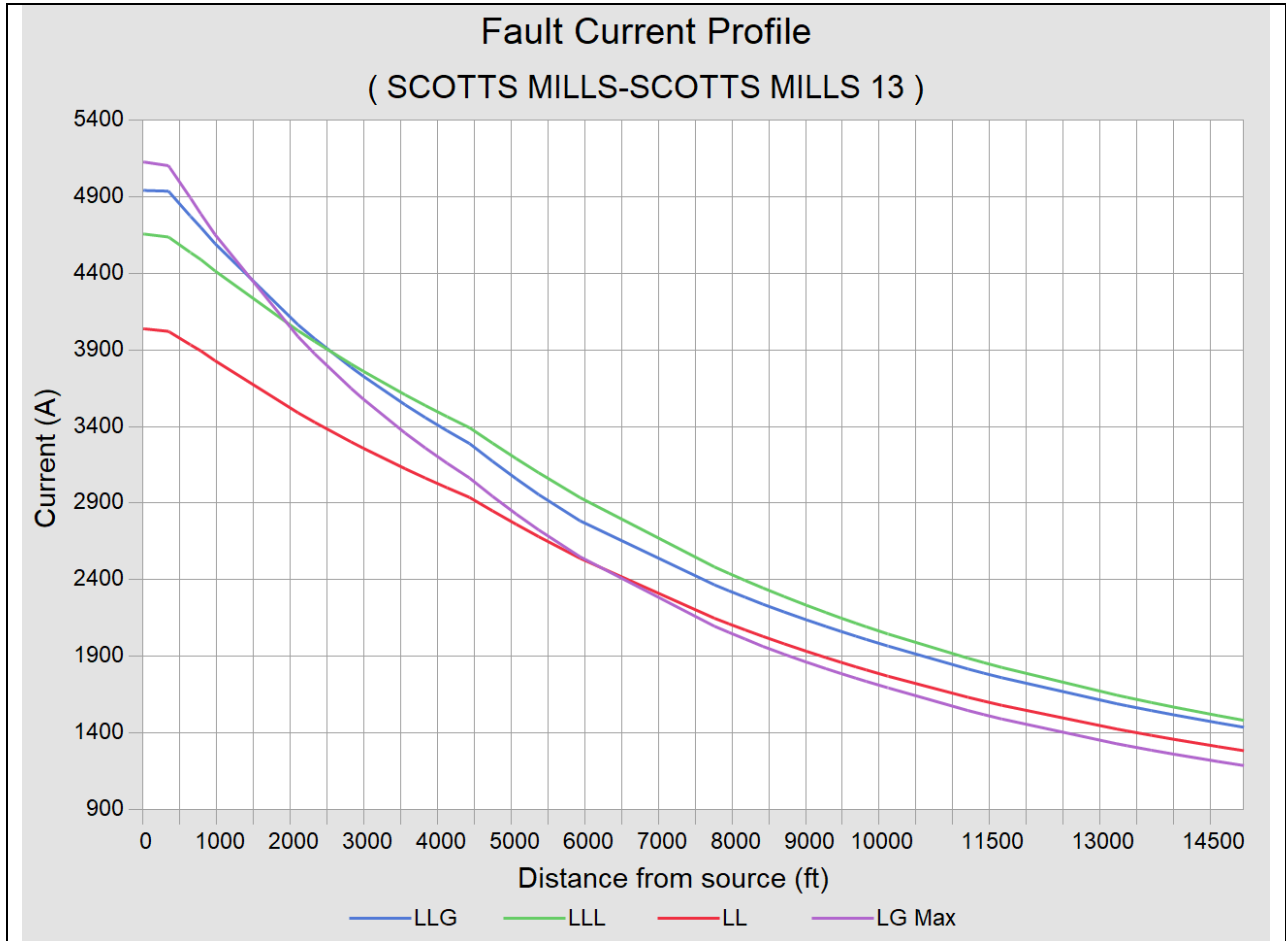
Feeder Voltage Profile for Light Loading Conditions



Location	VA (120V base)	VB (120V base)	VC (120V base)
Feeder Bus	121.5	120.4	120.4
Point of Interconnection	120.7	120.6	119.9

SYSTEM IMPACT STUDY (SIS) FOR DISTRIBUTION LINES AND EQUIPMENT

Fault Current Profile



Device Type or ID	Distance From Substation (ft.)	Bidirectional ? (Y/N)	Continuous Rating (Amps)	Momentary Symmetrical, Asymmetrical Interrupting Rating (Amps)	Max Fault Current (Amps)
BREAKER_SCOTT'S MILLS R106, BREAKER_A_UNKKV	0	Y	1200	>10000	5131
SW_1268, SW_1200A_UNKKV	342	Y	1200	20000	5106
RCL_4168, RCL_140A	641	N	140	6000	4895
FUSE_30384, 65_T	10113	Y	65	16000	2049

Pertinent Violations

Device Type	General Location	Violation Type	Comments
None.			

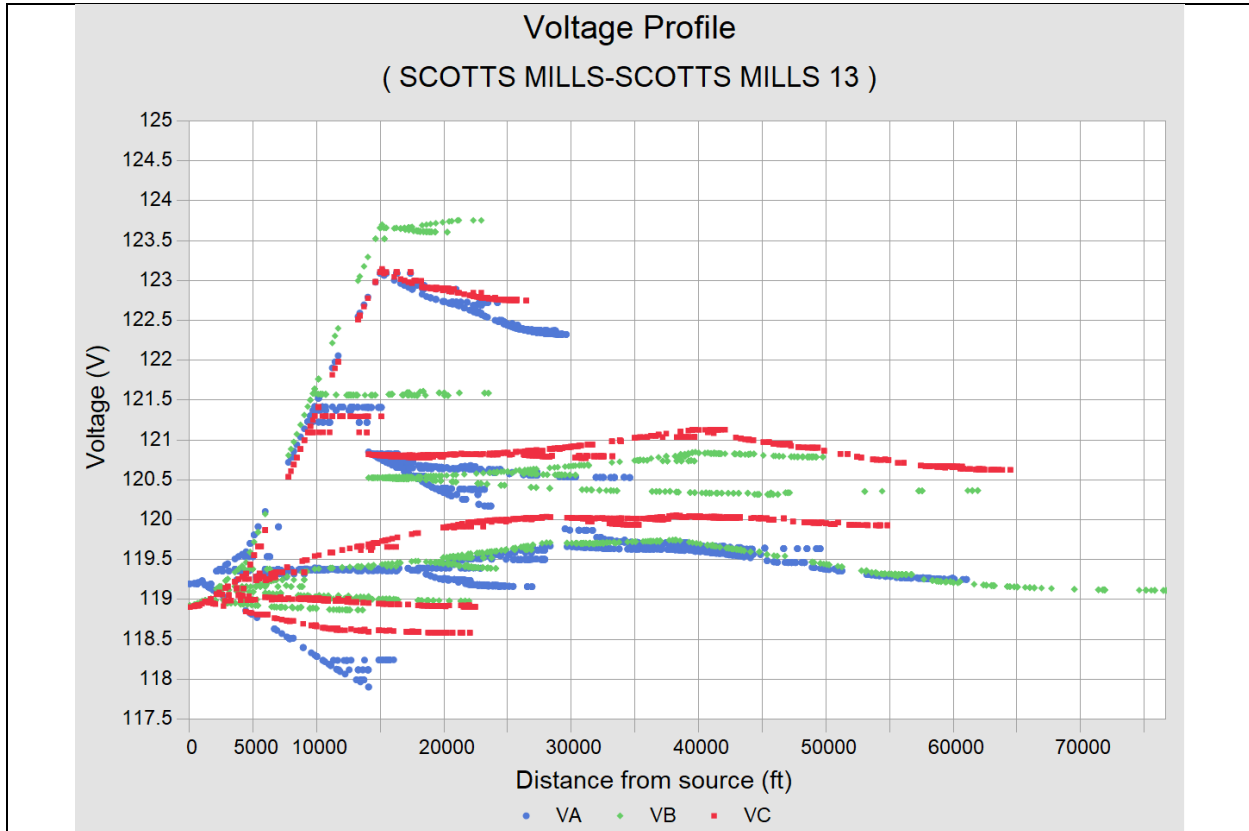
SYSTEM IMPACT STUDY (SIS) FOR DISTRIBUTION LINES AND EQUIPMENT

DG INTERCONNECTION – LIGHT LOADING (DG is connected and in service @ unity)

DG Location

DG Location	
Latitude (DD)	Longitude (DD)
45.08308	-122.672222

Feeder Voltage Profile for Light Loading Conditions (DG is connected and in service @ unity)



Location	VA			VB			VC		
	Voltage (DG ON)	Voltage (DG OFF)	DELTA%	Voltage (DG ON)	Voltage (DG OFF)	DELTA%	Voltage (DG ON)	Voltage (DG OFF)	DELTA%
Feeder Bus	121.6	121.5	0.1	120.5	120.4	0.1	120.5	120.4	0.1
POI	125.5	120.7	3.8	125.2	120.6	3.7	124.7	119.9	3.8

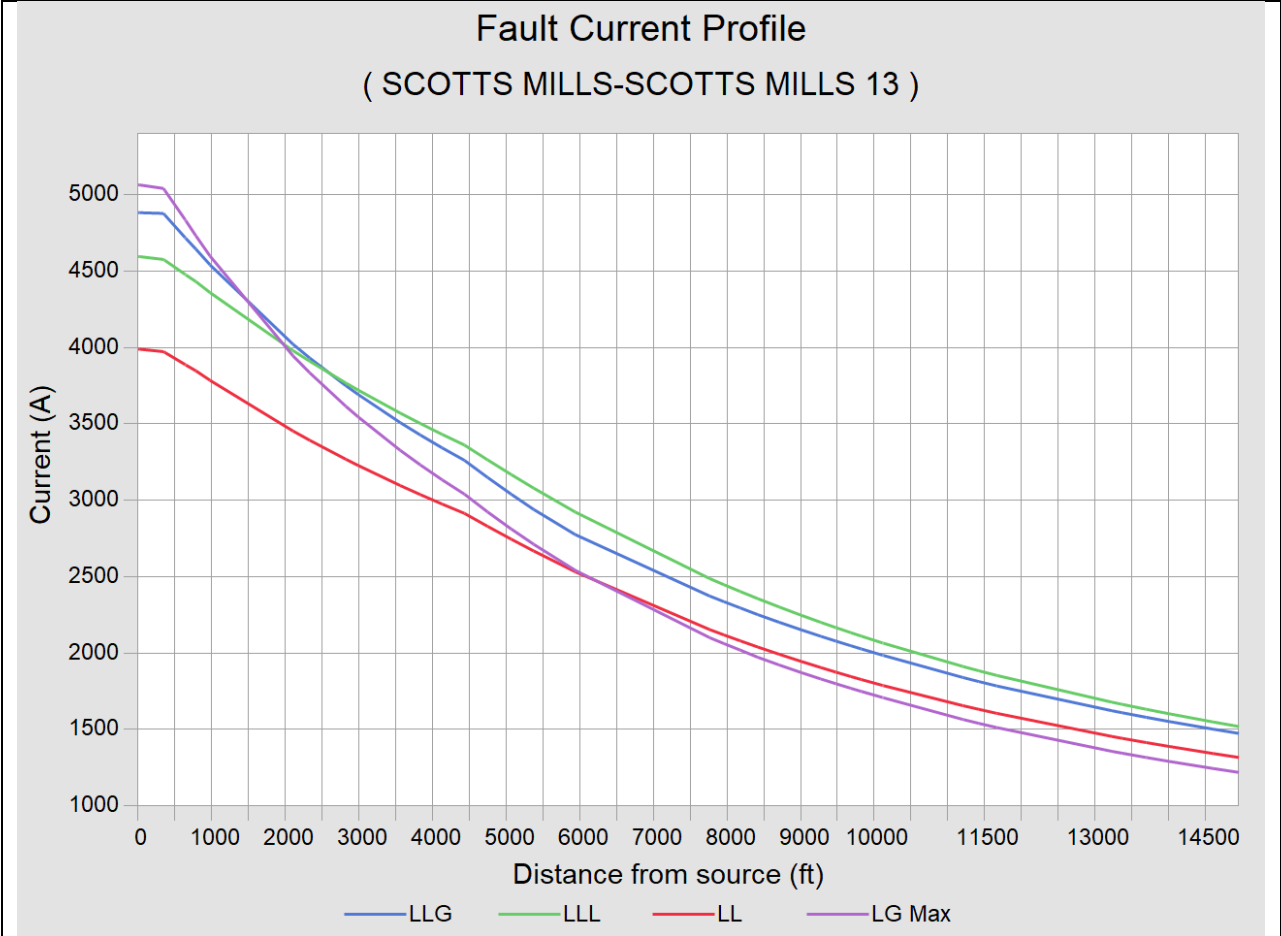
System Backfeed

Location	KW	KVAR
Feeder Breaker	-1008	-618
Transformer (115 or 57kV terminals)	-995	-606
Substation Source Location	-995	-606

SYSTEM IMPACT STUDY (SIS) FOR DISTRIBUTION LINES AND EQUIPMENT

Transmission Planning Recommendations (If there is backfeed onto the transmission system)

Fault Current Profile (DG is connected and in service @ unity)



Device Type or ID	Distance From Substation (ft)	Bidirectional ? (Y/N)	Continuous Rating (Amps)	Momentary Symmetrical, Asymmetrical Interrupting Rating (Amps)	Max Fault Current (Amps)
BREAKER_SCOTTS MILLS R106, BREAKER_A_UNKKV	0	Y	1200	>10000	5068
SW_1268, SW_1200A_UNKKV	342	Y	1200	20000	5044
RCL_4168, RCL_140A	641	N	140	6000	4836
FUSE_30384, 65_T	10113	Y	65	16000	2068

SYSTEM IMPACT STUDY (SIS) FOR DISTRIBUTION LINES AND EQUIPMENT

Pertinent Violations

Device Type	General Location	Violation Type	Comments
Fuse, FUZE_30384	NE Cascade Hwy 213 at bypass switch 3762	Overload	65T fuse on NE Cascade Hwy 213 at bypass switch 3762 is overloaded at 134.2% (87.2A at 65A rated ampacity).
Recloser, RCL_4168	Outside Scotts Mills substation on Cascade Hwy NE	Reverse Power Flow	The 140A Recloser #4168 experiences backflow. Since it is hydraulic it cannot function with reverse power flow and must be replaced.
N/A	POI	Voltage Flicker	DER interconnection can cause up to 3.8% voltage flicker, exceeding the 2.5% threshold for border line of visibility. Dynamic VAR support is required to mitigate voltage flicker.

SYSTEM IMPACT STUDY (SIS) FOR DISTRIBUTION LINES AND EQUIPMENT

BASE CASE INFORMATION FOR HEAVY LOADING CONDITIONS

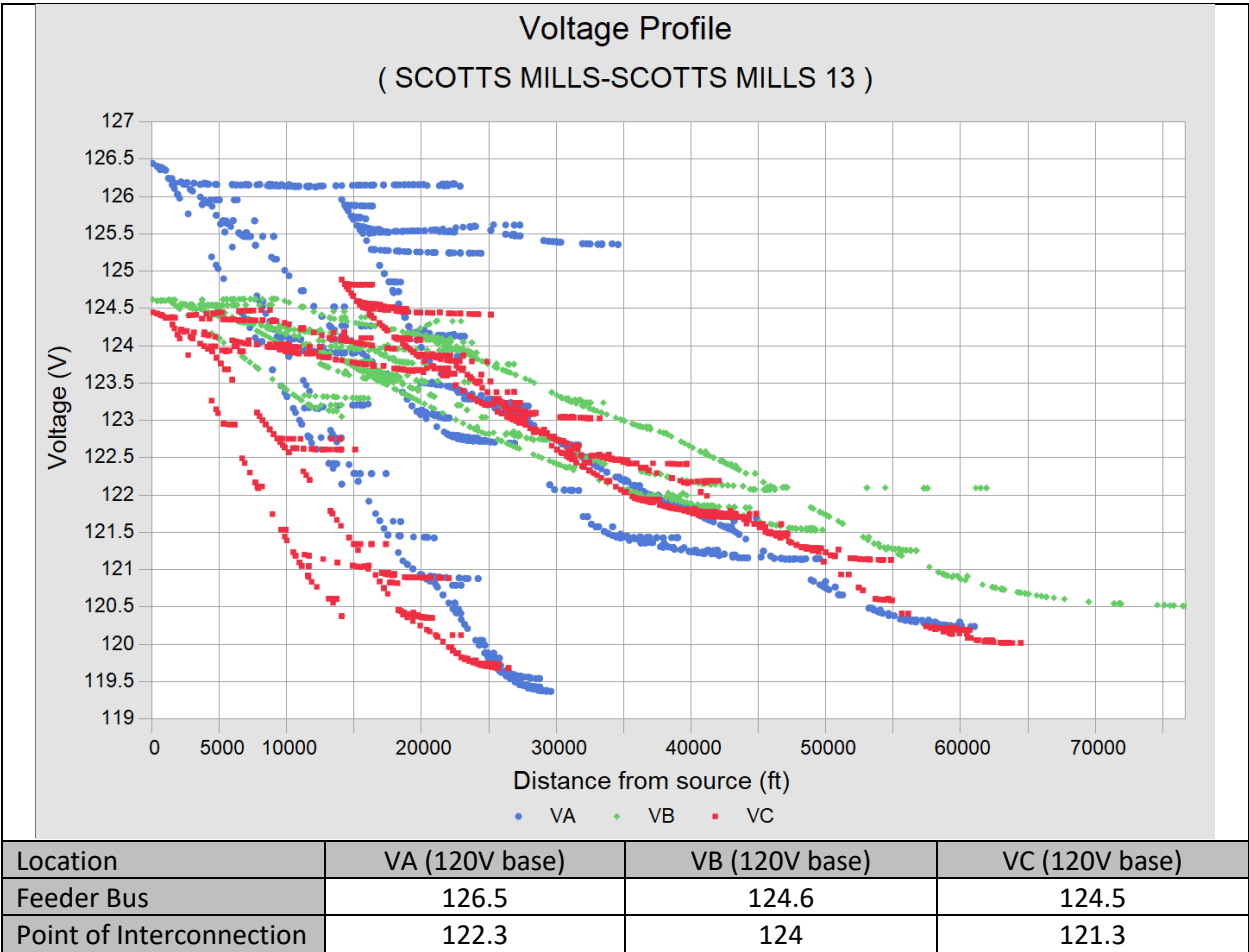
Heavy Loading Information

Simulated Date	7/16/2018
Simulated Hour	16:00

Feeder Loading Information (All feeders served from associated substation transformer)

Feeder Name	Loading (KW)	Loading (KVAR)
Scotts Mills – Scotts Mills 13	5495	310

Feeder Voltage Profile for Heavy Loading Conditions



SYSTEM IMPACT STUDY (SIS) FOR DISTRIBUTION LINES AND EQUIPMENT

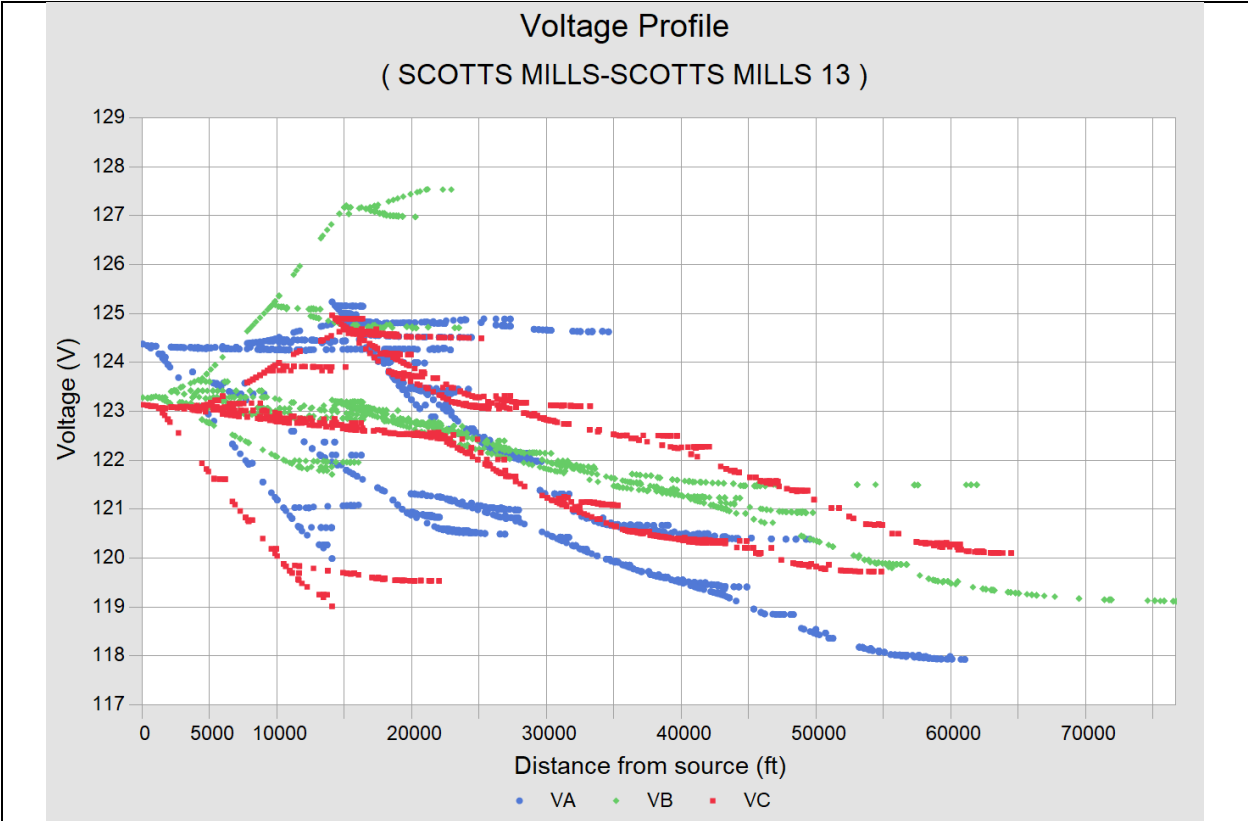
Pertinent Violations

Device Type	General Location	Violation Type	Comments
Multiple	Immediately outside substation and extending to the north	Overvoltage	Voltage exceeds 126V threshold (on 120V base) at 126.4V on the A phase.
Fuse, FUSE_29217	Overhead tapline off S Rosewood Way feeding S Summit Ln	Overload	Single-phase 15T fuse is overloaded at 146.7% (22.0A at 15A rated ampacity).
Fuse, FUSE_25880	Overhead tapline off Cascade Hwy NE feeding Abiqua Rd NE going southwest	Overload	3-phase 40T fuse (40A rating) experiences 44.1A (110.3%).
Fuse, FUSE_28304	Overhead tapline off Cascade Hwy S feeding S Rosewood Way	Overload	Two-phase 25T fuse bank is overloaded at 196.0% (49A on 25A rated capacity).
Fuse, FUSE_34504	Overhead tapline at intersection of Crooked Finger Rd NE and Ettlin Loop, feeding Crooked Finger Rd NE going south.	Overload	Two-phase 25T fuse (25A rating) experiences 28.2A (112.8%)
Fuse, FUSE_388657	Overhead tapline off Abiqua Rd NE extending to the Northwest, a span downstream (Northeast) of the transformer C:25 99883.	Overload	Two-phase 2T fuse (2A rating) experiences 2.1A (105%)

SYSTEM IMPACT STUDY (SIS) FOR DISTRIBUTION LINES AND EQUIPMENT

DG INTERCONNECTION – HEAVY LOADING

Feeder Voltage Profile for Heavy Loading Conditions (DG is connected and in service @ unity)



Location	VA			VB			VC		
	Voltage (DG ON)	Voltage (DG OFF)	DELTA%	Voltage (DG ON)	Voltage (DG OFF)	DELTA%	Voltage (DG ON)	Voltage (DG OFF)	DELTA%
Feeder Bus	126.8	126.5	0.2	124.9	124.6	0.2	124.7	124.5	0.2
POI	127.3	122.3	3.9	128.7	124.0	3.7	126.3	121.3	4.0

System Backfeed (Record loading at the source side of the proposed DG facilities’ feeder breaker, and at the distribution power transformer).

Location	KW	KVAR
Feeder Breaker	3493	327
Transformer (115 or 57kV terminals)	3513	438
Substation Source Location	3513	438

SYSTEM IMPACT STUDY (SIS) FOR DISTRIBUTION LINES AND EQUIPMENT

Pertinent Violations

Device Type	General Location	Violation Type	Comments
Multiple	Downstream of C:25 58188	Overvoltage	Interconnection causes the northern branch to exceed the 126V threshold (on 120V base), reaching 127.5V.
Fuse, FUSE_30384	NE Cascade Hwy 213 at bypass switch 3762	Overload	3-phase 65T fuse (65A rating) experiences 71.7A (110.3% loaded).
N/A	POI	Voltage Flicker	DER interconnection can cause up to 4.0% voltage flicker, exceeding the 2.5% threshold for border line of visibility. Dynamic VAR support is required to mitigate voltage flicker.

SYSTEM IMPACT STUDY (SIS) FOR DISTRIBUTION LINES AND EQUIPMENT

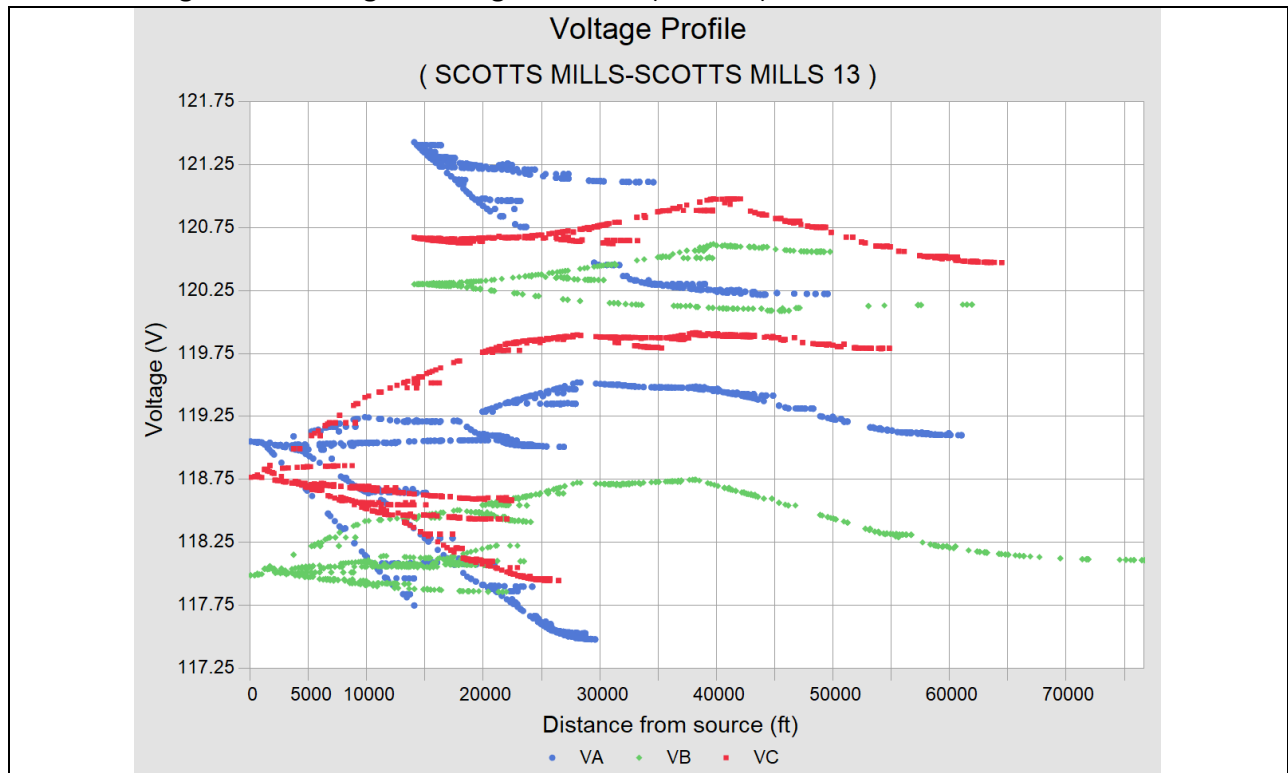
SYSTEM IMPROVEMENTS – LIGHT LOADING

System Improvement Summary

The improvements needed pertaining to this interconnection:

- Replace overloaded 65T (FUSE_ 30384) on NE Cascade Hwy 213 at bypass switch 3762 with 100T fuse bank
- Add Dynamic VAR support for voltage flicker.
- Install one (1) 300-amp Solid-Blade disconnect cutouts and service metering at DER lateral.

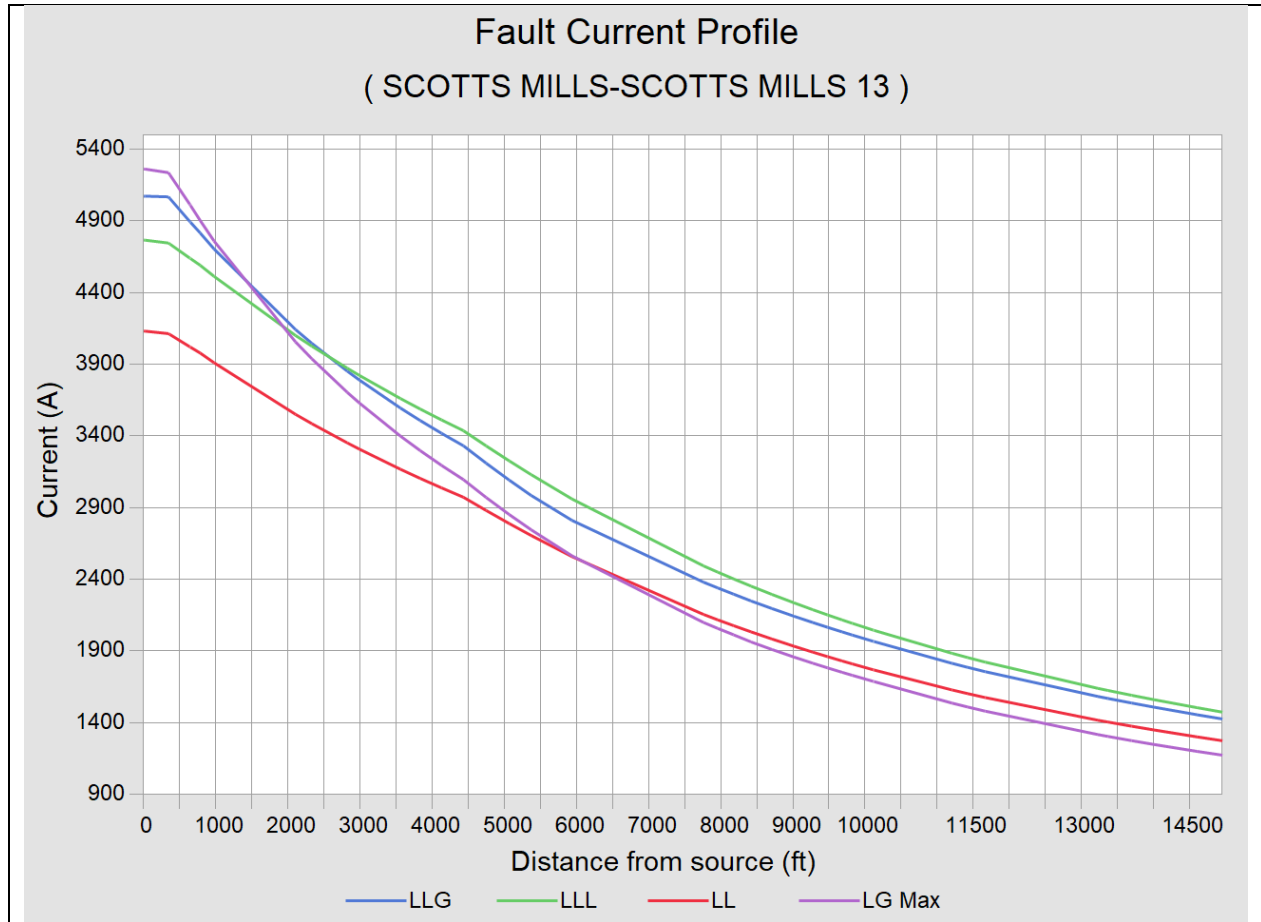
Feeder Voltage Profile for Light Loading Conditions (DG is off)



Location	VA (120V base)	VB (120V base)	VC (120V base)
Feeder Bus	119.1	118	118.8
Point of Interconnection	118.3	118.1	118.3

SYSTEM IMPACT STUDY (SIS) FOR DISTRIBUTION LINES AND EQUIPMENT

Fault Current Profile



Device Type or ID	Distance From Substation (ft)	Bidirectional ? (Y/N)	Continuous Rating (Amps)	Momentary Symmetrical, Asymmetrical Interrupting Rating (Amps)	Max Fault Current (Amps)
BREAKER_SCOTTS MILLS R106, BREAKER_A_UNKKV	0	Y	1200	>10000	5267
SW_1268, SW_1200A_UNKKV	342	Y	1200	20000	5240
NEW Recloser RCL_4168, RCL_800A	641	Y	800	12500	5016
NEW 100T Fuse bank where FUSE_30384 is located	10113	Y	100	16000	2049

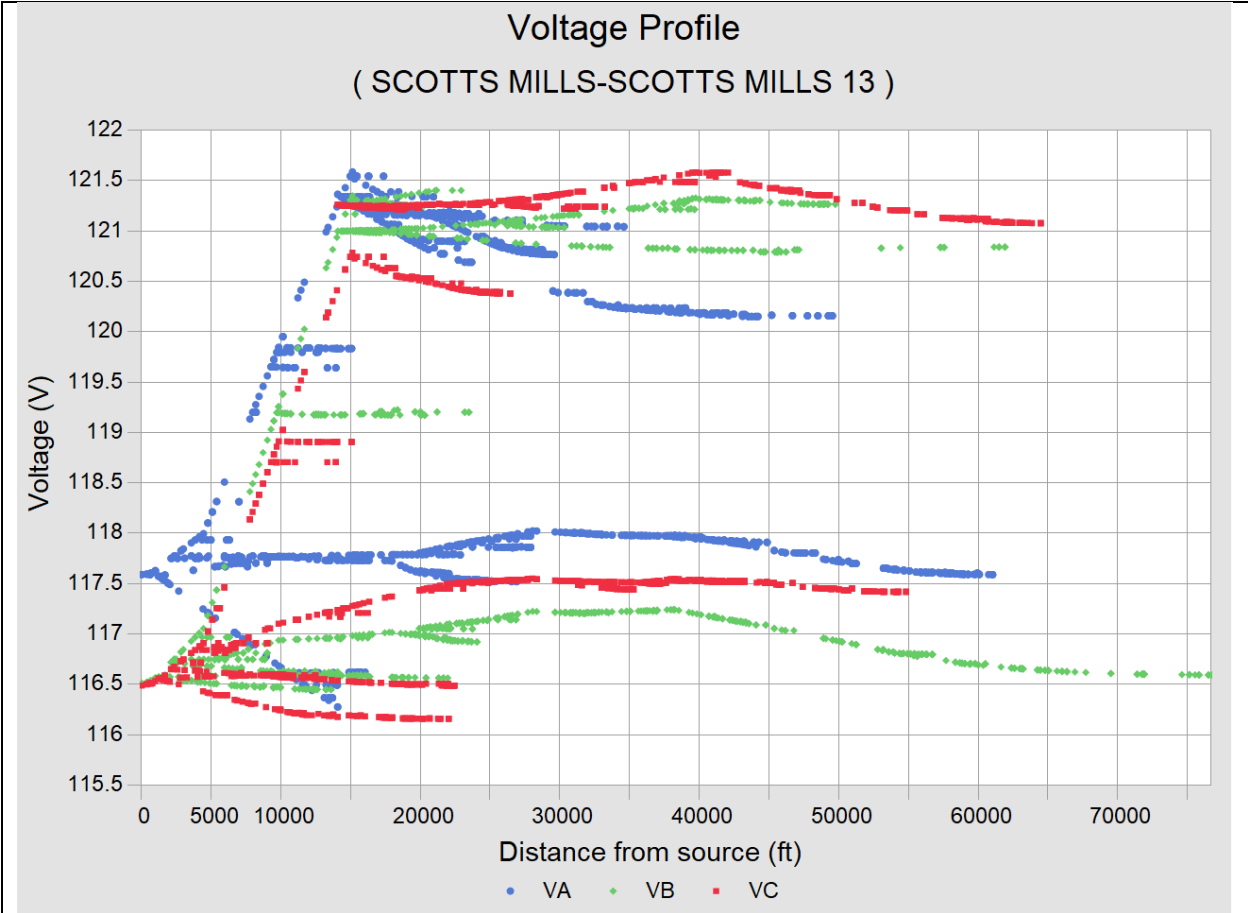
Pertinent Violations

Device Type	General Location	Violation Type	Comments
No violations.			

SYSTEM IMPACT STUDY (SIS) FOR DISTRIBUTION LINES AND EQUIPMENT

DG Interconnection – Light Loading (DG is connected and in service @ unity)

Feeder Voltage Profile for Light Loading Conditions (DG is connected and in service @ unity)



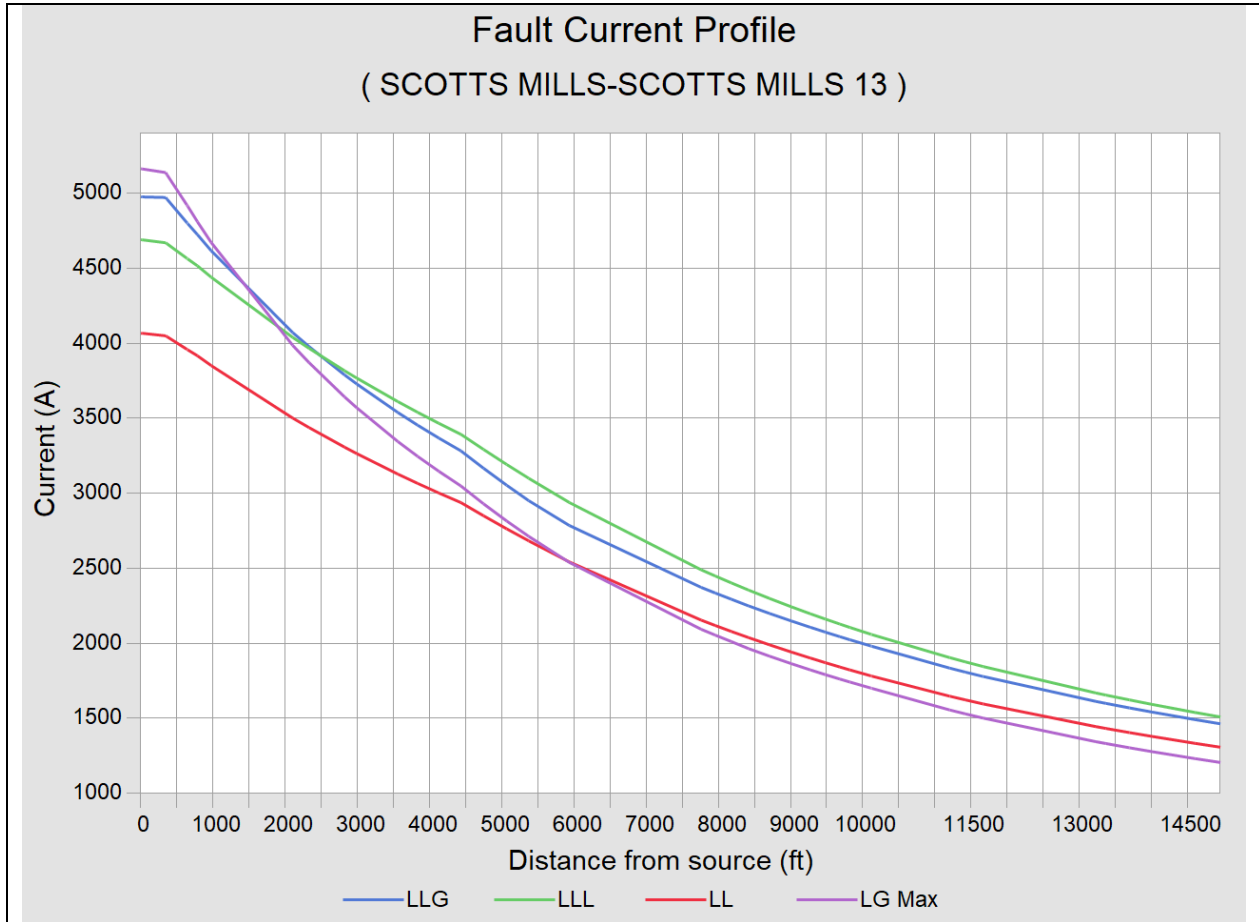
Location	VA			VB			VC		
	Voltage (DG ON)	Voltage (DG OFF)	DELTA%	Voltage (DG ON)	Voltage (DG OFF)	DELTA%	Voltage (DG ON)	Voltage (DG OFF)	DELTA%
Feeder Bus	119.2	119.1	0.1	118.1	118	0.1	118.9	118.8	0.1
POI	123.1	118.3	3.9	122.9	118.1	3.9	123.1	118.3	3.9

System Backfeed (Record loading at the source side of the proposed DG facilities’ feeder breaker, and at the distribution power transformer).

Location	KW	KVAR
Feeder Breaker	-1006	-568
Transformer (115 or 57kV terminals)	-993	-557
Substation Source Location	-993	-557

SYSTEM IMPACT STUDY (SIS) FOR DISTRIBUTION LINES AND EQUIPMENT

Fault Current Profile (DG is connected and in service @ unity)



Device Type or ID	Distance From Substation (ft)	Bidirectional ? (Y/N)	Continuous Rating (Amps)	Momentary Symmetrical, Asymmetrical Interrupting Rating (Amps)	Max Fault Current (Amps)
BREAKER_SCOTTS MILLS R106, BREAKER_A_UNKKV	0	Y	1200	>10000	5166
SW_1268, SW_1200A_UNKKV	342	Y	1200	20000	5141
NEW Recloser RCL_4168, RCL_800A	641	Y	800	12500	4921
NEW 100T Fuse bank where FUSE_30384 is located	10113	Y	100	16000	2062

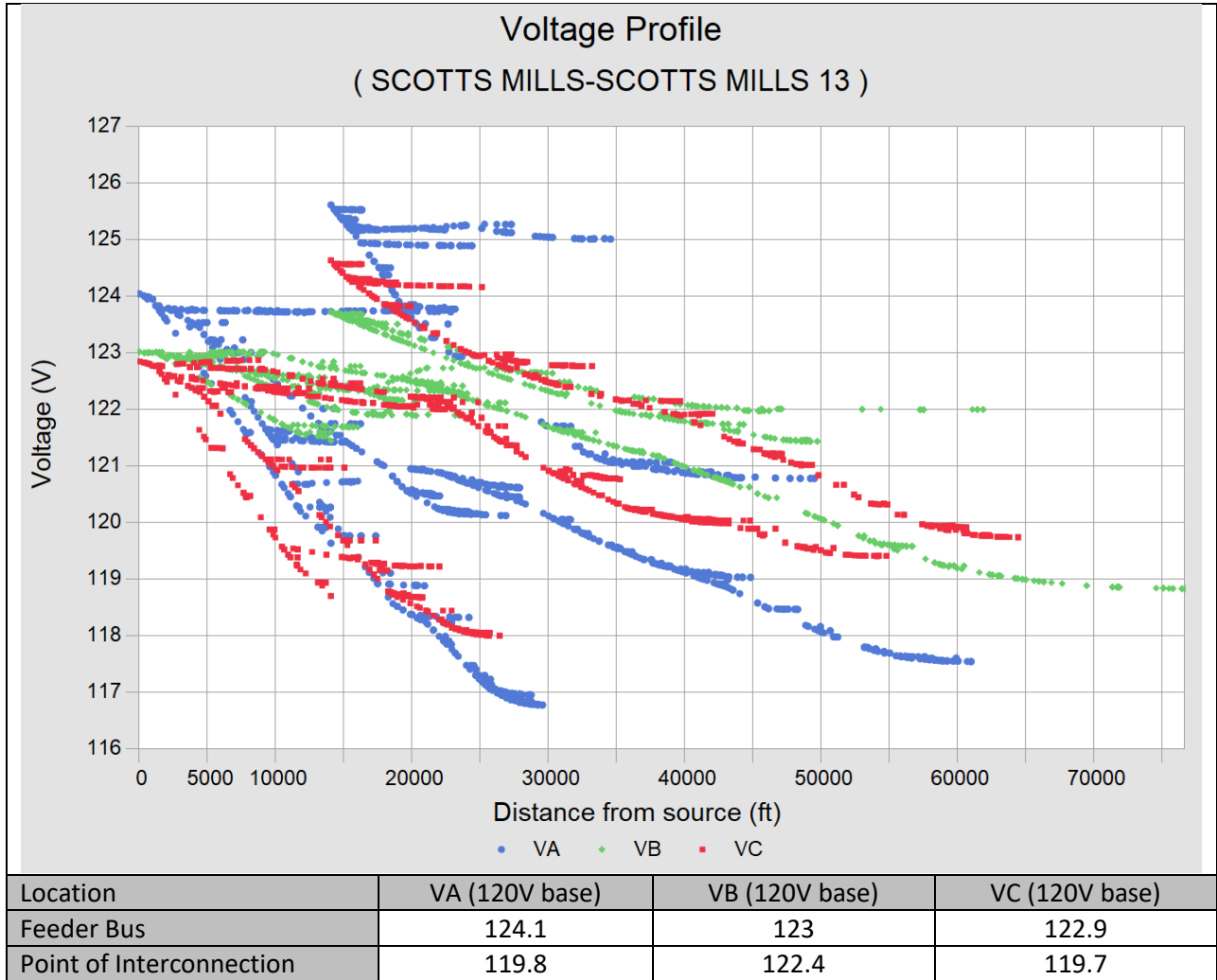
Pertinent Violations

Device Type	General Location	Violation Type	Comments
No violations.			

SYSTEM IMPACT STUDY (SIS) FOR DISTRIBUTION LINES AND EQUIPMENT

SYSTEM IMPROVEMENTS – HEAVY LOADING

Feeder Voltage Profile for Heavy Loading Conditions (DG is off)



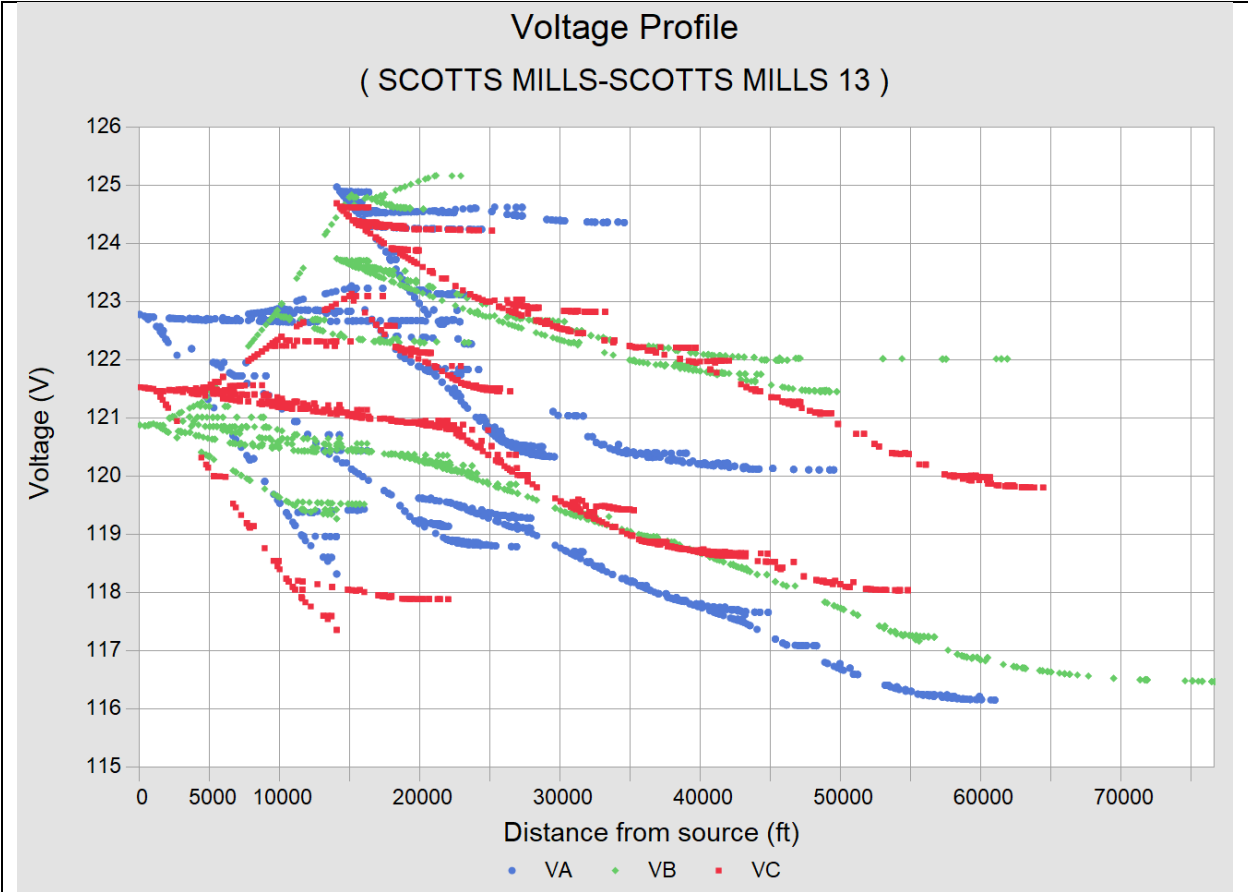
Pertinent Violations

Device Type	General Location	Violation Type	Comments
No violations.			

SYSTEM IMPACT STUDY (SIS) FOR DISTRIBUTION LINES AND EQUIPMENT

DG Interconnection – Heavy Loading (DG is connected and in service @ unity)

Feeder Voltage Profile for Heavy Loading Conditions (DG is connected and in service @ unity)



Location	VA			VB			VC		
	Voltage (DG ON)	Voltage (DG OFF)	DELTA%	Voltage (DG ON)	Voltage (DG OFF)	DELTA%	Voltage (DG ON)	Voltage (DG OFF)	DELTA%
Feeder Bus	124.4	124.1	0.2	123.3	123	0.2	123.1	122.9	0.2
POI	124.8	119.8	4.0	127.2	122.4	3.8	124.7	119.7	4.0

System Backfeed (Record loading at the source side of the proposed DG facilities’ feeder breaker, and at the distribution power transformer).

Location	KW	KVAR
Feeder Breaker	3497	377
Transformer (115 or 57kV terminals)	3518	489
Substation Source Location	3518	489

SYSTEM IMPACT STUDY (SIS) FOR DISTRIBUTION LINES AND EQUIPMENT

Pertinent Violations

Device Type	General Location	Violation Type	Comments
No violations.			

SYSTEM IMPACT STUDY (SIS) FOR DISTRIBUTION LINES AND EQUIPMENT

APPENDIX A: LINKS TO SUPPORTING DOCUMENTATION

[IEEE](#) – (Reference IEEE 1547-2003)

[Job Aid 1](#) – Minimum Daylight Load

[Job Aid 2](#) – Setting up CYME for an Interconnection Study

[Job Aid 3](#) – Finding Proposed Interconnection Locations

[Job Aid 4](#) – Conducting a CYME Interconnection SI Study

[Power Quality Guidelines](#) – LD19100

[Regulator and LTC Settings](#) – Substation

[Regulator Settings](#) – Feeder

[Small Power \(QF\) Interconnection Queue](#)

[Substation Highside Source Impedances](#)

[System Impact Schedule](#)

SYSTEM IMPACT STUDY (SIS) FOR DISTRIBUTION LINES AND EQUIPMENT

APPENDIX B: EQUIPMENT RATINGS AND STANDARDS

Cutouts

Polymeric Cutout Specifications					
Cutout Usage	PGE Part Number	Cutout Type	kV Rating	Amp Rating	
				Continuous	Asymmetrical Interrupting
General	40102	Open dropout	15	100	16,000
Special application	39478			200	12,000
	90006289	Solid blade		300	—

15-kV Solid Blade Cutout Ratings				
PGE Part Number	Voltage Rating (kV)		Current Rating (amps)	
	Nominal	Maximum	Continuous	Momentary (asymmetrical)
90006289	14.4	15.0	300	12,000

Table 10: 15-kV Solid Blade Cutout Ratings

Gang Operated Switches

15-kV Gang-Operated Switch Fault Ratings				
PGE Part Number	Manufacturer	Peak Withstand (amps, rms, 10 cycles)	Momentary, Symmetrical (amps, rms, three seconds)	Fault Closing (peak amps) ¹
03586	S&C Electric Company Omni-Rupter ²	65,000	20,000	42,000
	Inertia Engineering LineBOSS	51,000	32,000	30,000
03587	Unassembled S&C Electric Company Alduti-Rupter	40,000	25,000	20,000

Switches

15-kV Disconnect Switch Ratings				
PGE Part Number	Voltage Rating (kV)		Current Rating (amps)	
	Nominal	Maximum	Continuous	Momentary
03582	15	15.5	1200	61,000

Table 9: 15-kV Disconnect Switch Ratings

SYSTEM IMPACT STUDY (SIS) FOR DISTRIBUTION LINES AND EQUIPMENT

Reclosers

Types of Reclosers and Corresponding PGE Part Numbers						
PGE Part Number	Phase	Setting	Continuous Rating	Type	Symmetrical Amps	
03398	Single	1A3C	50	L ¹	3000	
03399		2A2D				
03401			70			
03405			100			
03406			140			
39135			50		3000	
03402			70	4200		
39130		1A3C	V4L	6000		
03403		2A2D				
39131		1A3C				
03408		2A2D				
39132		1A3C				
03410		2A2D				
39133		1A3C				
03411		2A2D				
39134		1A3C				
—		Three	Electronic allows a variety of curves	560 and 800 maximum	WE	10,000
03414				800 maximum	VWE	12,000
39756	NOVA				12,500	
40242						

1. The L-type recloser is no longer purchased by PGE; it is here for reference only.

Switchgear

Switchgear Design Ratings	
Design	Rating
Maximum voltage	15.5 kV
Power frequency	60 Hz
Lightning impulse withstand voltage	95 kV
Power frequency withstand voltage	35 kV
Continuous current	1200 A
Momentary asymmetrical current	40 kA
Fault-closing asymmetrical current	40 kA

Table 1: Switchgear Design Ratings

SYSTEM IMPACT STUDY (SIS) FOR DISTRIBUTION LINES AND EQUIPMENT

600-A, Pad-Mounted Switchgear Configurations				
PGE Part Number	Number of Switch Ways	Number of Fused Ways	Switchgear Momentary Fault Rating (kA, asymmetrical)	Unit Momentary Fault Rating (kA, symmetrical)
39686	3	1	40	14
39687	2	2		

Table 5: 600-A, Pad-Mounted Switchgear Configurations

900-A, Pad-Mounted Switchgear Configurations					
PGE Part Number	Number of Switch Ways	Number of Fault Interrupter Ways	Switch Way Continuous Rating (amp)	Fault Interrupter Way Continuous Rating (amp)	Unit Fault Rating (kA, symmetrical)
90008072	2	2	900	600	25
90008073	3	1		—	
90008074	4	—		—	

Table 7: 900-A, Pad-Mounted Switchgear Configurations

1200-A, Pad-Mounted Switchgear Configurations				
PGE Part Number	Number of Switch Ways	Number of Fused Ways	Switchgear Momentary Fault Rating (kA, asymmetrical)	Unit Momentary Fault Rating (kA, symmetrical)
01433	4	—	40	35
01434	2	2		14
01435	3	1		
40050 ¹	4	—	61	35
40051 ¹	3	1		

1. This style is currently only used for Intel sites that require a higher fault rating.

Table 3: 1200-A, Pad-Mounted Switchgear Configurations

SYSTEM IMPACT STUDY (SIS) FOR DISTRIBUTION LINES AND EQUIPMENT

600-A, Submersible Switchgear Ratings						
PGE Part Number	Number of Switch Ways	Number of Fault Interrupter Ways	Unit Continuous Rating (amp)	Switchgear Continuous Rating (amp)	Fault Interrupter Continuous Rating (amp)	Unit Fault Rating (kA, symmetrical)
01425	2	2	600	600	200	12.5
01427	3					
01428		3				

Table 10: 600-A, Submersible Switchgear Ratings

900-A, Submersible Switchgear Dimensions					
Unit Fault Rating (kA, symmetrical)	Total Number of Ways	Tank Width ¹ (inch)	Tank Depth ² (inch)	Bushing Height (inch)	Total Height (inch)
12.5	4	65.4375	40.0625	17.5	26.625
25			40.25	28.75	33
12.5	5	80.4375	40.0625	17.5	26.625
25			40.25	28.75	33
12.5	6	95.4375	40.0625	17.5	26.625
25			40.25	28.75	33

1. Termination side of tank.
2. Depth includes controller enclosure but not bushings.

Table 12: 900-A, Submersible Switchgear Dimensions

IEEE Voltage Range/Clearing Times Table

Voltage range (% of base voltage ^a)	Clearing time(s) ^b
V < 50	0.16
50 ≤ V < 88	2.00
110 < V < 120	1.00
V ≥ 120	0.16

^aBase voltages are the nominal system voltages stated in ANSI C84.1-1995, Table 1.

^bDR ≤ 30 kW, maximum clearing times; DR > 30kW, default clearing times.

The voltage deviation when the DG is off line or in service must be within Voltage Guideline limits from 88% to 110% of the nominal voltage at the point of interconnection and the substation bus. The voltage guideline set by IEEE-1547 requires DG to disconnect from the grid or clear at the set time shown.

Exhibit 7

PGE Letter – December 7, 2020



Portland General Electric Company
121 SW Salmon Street • Portland, OR 97204
portlandgeneral.com

December 7, 2020

Via Electronic Mail

Hunter Strader
GreenKey Solar
hunter@greenkeysolar.com

RE: Marquam Creek Solar

Dear Mr. Strader:

Portland General Electric Company (PGE) is in receipt of Marquam Creek Solar's ("Marquam Creek") letter from November 24, 2020, which explained Marquam Creek's concerns about the System Impact Study (SIS) report for SPQ0093 from January 21, 2020. Marquam Creek identified two main concerns: (1) consistency with the studies performed in the past for another project SPQ0037 and (2) how the studies account for net metering generation projected in calculating the net daytime minimum load (DML). PGE addresses these concerns below.

SPQ0037 Interconnection Requirements and Costs:

After careful review of the interconnection studies performed for SPQ0037, PGE has determined that if the studies were performed today, SPQ0037 would have been required to install 3V0 protection. At the time when SPQ0037 was first studied (its feasibility study from August 18, 2017), the industry had not yet identified 3V0 as a method to mitigate loss of ground, and so 3V0 was not included in the feasibility study for SPQ0037. 3V0 protection was also not required in the SIS or facility study for SPQ0037, either because their initial study was prior to the addition of the 3V0 standard, or due to an oversight on PGE's part for not updating SPQ0037's protection requirements to include the new 3V0 protection scheme. After SPQ0037 withdrew, SPQ0046 (which became the next highest-queued qualified facility (QF)) was restudied at the SIS stage (see SPQ0046 SIS dated April 26, 2019), and since its generation (2.25MW) would cause transformer backfeed (DML at the time was 2.06MW), 3V0 protection was required (in addition to the other protection requirements that are now the responsibility of Marquam Creek to pay since Marquam Creek is now the highest-queued project on Scotts Mills). If Marquam Creek wishes to compare their cost estimates to another QF, the results of the April 26, 2019 SIS for SPQ0046 are a much better comparison than the SPQ0037 Facility Study since SPQ0046 had all the same protection requirements as Marquam Creek. As all the higher-queued projects have withdrawn and the same protection requirements as Marquam

Creek have been estimated for SPQ0046, the studies for SPQ0037 omitting the 3V0 requirement do not impact Marquam Creek.

Daytime Minimum Load:

As described in the latest revision of the SIS for SPQ0093, protection must be put in place to prevent fault-induced overvoltage due to the combination of reverse power flow on the substation transformer and a fault on the high-side of the transformer. 3V0 protection is the method required for line tap or line control substations since they do not make the substation transformer appear to the transmission system as an effectively grounded source.

When determining whether 3V0 protection will be required for line tap or line control substations such as Scotts Mills substation, PGE compares the measured net DML of the transformer to the aggregate generation (defined below), and if the aggregate generation exceeds 100% of the measured net DML, then 3V0 protection is required for the substation. It is critical that reverse power flow on the transformer not occur without appropriate protection (3V0 protection for line tap or line control substations), otherwise the substation equipment and service reliability to customers would be put at risk (substation equipment would be damaged if a high-side fault occurred during reverse power flow without 3V0 protection). As such, it is necessary that PGE consider a safety factor in determining when 3V0 protection is required to guarantee reverse power flow cannot occur without 3V0 protection. Currently, PGE implements a safety factor by defining "aggregate generation" as the sum of queued QF generation up to the studied project that is not reflected in the measured DML and all Net Energy Metering (NEM) generation (up to the studied project) which includes existing NEM generation. To be thorough, other distributed generation and non-transfer trip Dispatchable Standby Generation (DSG) would be included in the "aggregate generation" calculation as well, but there is none of this other distributed generation served by Scotts Mills substation. This does not reflect mistaken "double-counting" of existing Net Energy Metering generation, as this is an intentional safety and reliability precaution PGE takes to ensure substation transformer reverse power flow cannot occur until 3V0 protection is in place. Additionally, as NEM generation can vary much more than QF generation, the contribution of NEM generation is unknown at the time of the DML measurement. Given this, it is entirely possible that some NEM generation did not contribute at the time of the DML measurement but may contribute at another time. To account for this possibility, PGE takes the safety and reliability backed approach of effectively assuming none of the NEM generation contributed at the time of the DML measurement by including existing NEM generation in the aggregate generation calculation.

Using this method, the "aggregate generation" is calculated as the sum of SPQ0093 Marquam Creek's 2MW generation and 193kW of existing NEM generation (all NEM prior to Marquam Creek entering the queue, *excluding the seven NEM projects that applied after Marquam Creek*), which comes to 2.193MW. As the transformer DML is 2.105MW, the

aggregate generation exceeds 100% of the DML of the transformer, and therefore 3V0 protection is required for SPQ0093 Marquam Creek to interconnect to Scotts Mills substation.

In most cases, including existing NEM generation in the aggregate generation compared to the measured net DML would make no difference in protection requirements since aggregate QF generation is typically much larger than the existing NEM generation (one QF project's nameplate is often an order of magnitude larger than the aggregate existing NEM generation). For that reason, PGE has not always clarified its method of including existing NEM generation in the aggregate generation considered for protection requirements. This is the case with PGE's comments regarding Carnes Creek Solar's petition; including existing NEM generation in the aggregate generation calculation would have made no difference in the protection requirements for Carnes Creek Solar (their nameplate is 2.5MW and the transformer DML was 1.73MW according to the Carnes Creek Solar SIS), and adding that detail or other details that had no impact would have confused the clarity of the point PGE was making to Carnes Creek Solar. Therefore, that detail was omitted in PGE's comments regarding its methods for determining protection requirements for Carnes Creek.

PGE's approach to interconnection is in line with the regulations and PGE evaluates each project in serial queue order regardless of the program under which the interconnection occurs. This approach was taken with the interconnection projects proposed on the Scotts Mills substation. PGE evaluated Marquam Creek with 193kW of NEM on the feeder (all of which applied prior to Marquam Creek entering the QF interconnection queue) and determined Marquam Creek was the first project that could potentially backfeed through the substation and assigned Marquam Creek the 3V0 protection requirement. PGE then evaluated each NEM project based on the fact that Marquam Creek would be installing the 3V0 protection scheme. Once 3V0 is in place, additional NEM generation can be added with no additional requirements. PGE also determined NEM projects could be installed ahead of the 3V0 protection requirement because there was no potential for the generation from those NEM projects to backfeed into the substation. If Marquam Creek elected not to move forward the amount of NEM on the feeder would not require 3V0 protection.

Conclusion:

PGE understands that Marquam Creek is concerned about including existing NEM generation in the "aggregate generation" compared to the net DML since this method determines that Marquam Creek must pay for the cost to install 3V0 protection at Scotts Mills substation. However, this method is intentional and based on safety and reliability considerations to ensure that reverse power flow on the substation transformer does not occur without proper substation protection (3V0 protection in this case). It is also a prudent method to account for existing NEM generation that did not contribute during the time of DML measurement. If Marquam Creek were to interconnect without installing 3V0 protection at Scotts Mills substation, PGE believes this would put the substation equipment and service

Hunter Strader
Marquam Creek Solar
December 7, 2020
Page 4

reliability to customers at risk. PGE also recognizes that if SPQ0037 were to be studied today, it would have required 3V0 protection. However, since SPQ0037 and all other higher-queued projects have withdrawn, and since the protection upgrades currently required of Marquam Creek have been estimated in the April 26, 2019 SIS for SPQ0046, PGE believes that there is no impact to Marquam Creek from the omission of the 3V0 requirement in the SPQ0037 studies.

Please contact us if you have additional questions or need further clarification.

Sincerely,



Frederick Harris, P.E.
Manager, Distribution Planning

&



Janette M. Sandberg, P.E.
Protection O&P Engineer

Exhibit 8

Marquam Creek Solar's Letter

December 11, 2020



RICHARDSON ADAMS, PLLC
ATTORNEYS AT LAW

richardsonadams.com
Tel: 208-938-7900 Fax: 208-938-7904
P.O. Box 7218 Boise, ID 83707 - 515 N. 27th St. Boise, ID 83702

December 11, 2020

Via Email

David White
Kristin Ingram
Portland General Electric Company
Kristin.Ingram@pgn.com
David.White@pgn.com

Re: Marquam Creek Solar, LLC Interconnection Issues

Dear David and Kristin:

We have received Portland General Electric Company's ("PGE") letter dated December 7, 2020, addressing issues related to the Marquam Creek Solar, LLC ("Marquam Creek Solar") Generator Interconnection Agreement ("GIA") and ongoing re-studies, which was provided as follow up to our telephone conversation and letter to PGE dated November 24, 2020. Marquam Creek Solar does not agree with the analysis contained in PGE's letter that double counts the net metering generation in calculating of the Daytime Minimum Load, as well as other aspects of the letter that appear to contradict PGE's prior treatment of certain issues. However, despite those disagreements, we would like to propose a resolution that would allow both parties to move forward with interconnecting the facility on achievable terms without needing to resolve the outstanding disagreements.

We understand from PGE's letter that PGE currently calculates the Daytime Minimum Load on the relevant transformer to be 2.105 MW. PGE calculates that with Marquam Creek Solar sized at 2.0 MW, the aggregate capacity on the transformer would be 2.193 MW – thus exceeding the Daytime Minimum Load by only 88 kW. As we understand PGE's position, this 88 kW of excess aggregate generation triggers the need for 3V0 sensing and associated protective equipment that was not included in Marquam Creek Solar's fully executed GIA and the study results agreed to therein. As we have discussed, this extra functionality and equipment is a cost-prohibitive obstacle to moving forward with the revised interconnection configuration that PGE proposes to utilize instead of the initial facilities designed and incorporated into the executed GIA. To be clear, Marquam Creek Solar disagrees with PGE's analysis and conclusions that this additional functionality is necessitated by Marquam Creek Solar's proposed 2.0 MW facility, but setting aside that disagreement, it is apparent that there may be a mutually agreeable solution to the problem.

Specifically, Marquam Creek Solar proposes that under the unique circumstances here, Marquam Creek Solar should be permitted to volunteer to reduce its proposed facility's interconnection capacity, without loss of queue position, to a level that PGE agrees will not trigger the need for 3V0 sensing and added equipment triggered by exceeding Daytime Minimum Load. Marquam Creek Solar has flexibility on the precise reduction in capacity required – be it 88 kW, 100 kW or some other reasonable amount PGE could select to achieve that objective.

Although reducing the capacity of an interconnection request ordinarily is not permitted under the Oregon Public Utility Commission's ("OPUC") Division 82 rules, exceptions can and should be granted where warranted, and such an exception is warranted here. Contractually, the parties are currently bound by a GIA that incorporates interconnection design that does not include the costly 3V0 sensing, and PGE wishes to amend such GIA to include that new equipment and functionality as identified in ongoing re-studies. Under Section 8.2 of the GIA, such amendments to the GIA may be made only by mutual agreement. Marquam Creek Solar is willing to agree to such amendment to incorporate the upgrades needed in re-studies if the GIA will also be amended to allow the capacity of Marquam Creek Solar to be downsized to a level below PGE's revised Daytime Minimum Load calculations in order to avoid such aforementioned upgrades. Additionally, we request PGE to provide a firm number for downsize so this issue will not arise again.

The proposed reduction in capacity is in the range of only 100 kW, or five percent of the facility's initial 2.0 MW capacity, and a de minimis downsizing of that magnitude is routinely allowed during interconnection procedures in effect across the country without loss of queue position. For example, the Federal Energy Regulatory Commission's ("FERC") Large Generator Interconnection Procedures contain a provision (at § 4.4) that requires acceptance of an interconnection customer's proposed 15-percent reduction in capacity prior to the Facilities Study stage, such as the Facilities Re-Study currently under consideration for Marquam Creek Solar.¹ Further reductions are also potentially authorized under "material modification" review at any point. Similarly, FERC has approved provision in the CAISO tariff that allows an interconnection customer to reduce capacity by up to five percent for any reason after execution of the GIA but prior to commercial operation, and allows reductions in excess of five percent where the reduction is necessitated by reasons beyond the interconnection customer's control² – such as the changed circumstances here where PGE now concludes after execution of the GIA that Marquam Creek Solar's initial capacity would cause aggregate load on the transformer to exceed Daytime Minimum Load. FERC explained this right "provides interconnection customers with increased flexibility to reduce the size of their generating facility without risking the need to start over with a new interconnection request[,] but "also protects all market participants by minimizing the likelihood that a decision to downsize made by an interconnection customer will result in a change to the scope of identified transmission upgrades."³ Similarly, in this case, Marquam Creek Solar merely seeks to preserve the scope of upgrades included in the initial Facilities Study approved by

¹ See Order No. 845, 163 FERC ¶ 61,043, at P 407 (April 19, 2018) (explaining there is a right to reduce capacity 60 percent prior to the system impact study stage, 15 percent more prior to the Facilities Study stage, which totals 75 percent overall without material modification review).

² *Cal. Indep. Sys. Operator Corp.*, 138 FERC ¶ 61,060, 61,298 (Jan. 30, 2012).

³ *Id.*

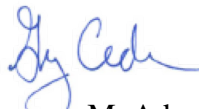
the parties and incorporated into the executed GIA. The proposed five-percent reduction here is therefore reasonable and even routine in the industry.

Additionally, allowing for such minimal reduction to the capacity in advance of further re-study will allow the parties to maximize the use of PGE's distribution system for the purposes of bringing distributed generation online under Oregon's community solar program without cost-prohibitive and wastefully unnecessary interconnection protective equipment. To the extent PGE believes that a formal waiver of the applicable administrative rule must be obtained from the OPUC, we are confident the OPUC would grant such a waiver in this case. If PGE believes a waiver is required, Marquam Creek Solar proposes that the parties jointly file such a request as soon as possible and move forward with the Facilities Re-Study upon approval of such waiver.

Procedurally, Marquam Creek Solar will submit its Facilities Study deposit with the executed Facilities Study Agreement on the deadline PGE has established, December 14, 2020. Marquam Creek Solar requests that PGE confirm the re-study will take the reduced capacity into account, which PGE will provide prior to Facilities Study commencement, and not require Marquam Creek Solar to submit a new interconnection application or otherwise lose its queue position on account of such reduced capacity. On the other hand, if PGE is not willing to cooperate to allow the requested reduction in capacity, we expect that Marquam Creek Solar will retain its current queue position and 2.0 MW capacity in its GIA and under the Facilities Re-Study stage, in which case Marquam Creek Solar reserves its right to challenge PGE's determinations and actions before an appropriate tribunal.

Please contact me with PGE's position on the proposal in this letter or if you have any questions.

Sincerely,



Gregory M. Adams

Attorney for Marquam Creek Solar, LLC

Exhibit 9

PGE Letter – December 17, 2020

PGE Email – January 15, 2021



Portland General Electric Company

Legal Department
121 SW Salmon Street, 1WTC1301
Portland, Oregon 97204
Phone 503-464-7370
Fax 503-464-2200
portlandgeneral.com

Kristin M. Ingram

Assistant General Counsel
kristin.ingram@pgn.com

December 17, 2020

Via Email

Greg Adams
Richardson Adams, PLLC
P.O. Box 7218
Boise, ID 83708

Re: Marquam Creek Solar, LLC Interconnection

Dear Greg:

Portland General Electric Company ("PGE") is in receipt of your letter dated December 11, 2020 regarding Marquam Creek Solar, LLC's ("Marquam Creek") interconnection application.

In your letter, you propose that Marquam Creek be allowed to reduce its facility's interconnection capacity without a loss in queue position. As you note, a change in nameplate is not permitted under the Oregon Public Utility Commission's ("OPUC") Division 82 rules. OAR 860-082-0025(c) requires a small generator interconnection applicant to "submit a new application if the applicant proposes to make any change ... affecting the nameplate capacity of the proposed small generator facility." That rule serves a useful purpose: the orderly and consistent administration of the interconnection queue. The facilities and upgrades required for each project's interconnection depend on the projects that are interconnected higher in the queue. As a result, each interconnection applicant relies on higher-queued applicants' project specifications when determining the facilities and upgrades necessary to interconnect. Making exceptions to the rule would encourage future interconnection customers to make adjustments to their project specifications to narrowly avoid paying for upgrades that their projects would otherwise require. Such a result would increase the transaction costs of interconnecting as projects are changed at the last minute and projects lower in the queue require new studies and possibly new upgrades and facilities.

You requested that PGE and Marquam Creek seek a waiver of OAR 860-082-0025(1)(b)&(c) from the OPUC. OAR 860-082-0010 permits the OPUC to waive application of the small generator interconnection rules "for good cause shown."

Greg Adams
Richardson Adams, PLLC
December 17, 2020
Page 2

PGE does not believe that the facts of this case warrant seeking a waiver. A waiver would harm PGE's ability to manage its interconnection queue and would harm lower-queued projects.

You cite the FERC Large Generator Interconnection Procedures as a basis for supporting the modification. Those Procedures have no applicability to Marquam Creek's requested interconnection.

Additionally, you indicated that PGE should move forward with the Marquam Creek Facilities Study but asked that the project be studied at the reduced capacity. For the reasons stated above, PGE is not willing to proceed with studying Marquam Creek's project at the reduced capacity. However, PGE has taken note of Marquam Creek's comments and concerns regarding the System Impact Study that was issued on January 21, 2020. Assuming Marquam Creek decides to move forward with the Facilities Study at its current stated capacity, PGE will take into consideration those comments and concerns while performing the Facilities Study with the goal of ensuring that PGE's system requirements are consistent with prudent utility practices.

Please let me know if you have any questions on this.

Sincerely,



Kristin M. Ingram
Assistant General Counsel

From: [Kristin Ingram](#)
To: [Greg Adams](#); [David White](#)
Cc: [Kristin Ingram](#)
Subject: RE: Marquam Creek Solar Interconnection Letter
Date: Friday, January 15, 2021 4:19:21 PM
Attachments: [image001.png](#)
[Goose Creek - Facility Study.pdf](#)
[SP Solar 2 LLC \(Goose Creek\) 1.13 MW SLD 9.29.16.pdf](#)
[Goose Creek - SP Solar 2 Interconnection Agreement.pdf](#)

Hi Greg,

With respect to the items you have listed below:

- As noted in my December 17, 2020 to you, PGE is not agreeable to waiving the requirements of OAR 860-082-0025(1)(b). PGE would not support, and would likely oppose, a petition to the OPUC to change the nameplate. PGE does not believe that the facts of this case warrant seeking a waiver. A waiver would harm PGE's ability to manage its interconnection queue and would harm the lower-queued project.
- We have done some looking into SPQ0026, and I have attached the project documentation that PGE was able to locate. We can see that that the requirements changed from the facilities study to those in the Interconnection Agreement, but we are not sure of the process that was followed. It is possible that PGE may have permitted a change in nameplate without a new application because there was not a lower queued project that would have been impacted. However, this is not something that we currently allow and have taken a position to always require a new application consistent with OAR 860-082-0025(1)(b) as we are frequently asked by Applicants to change the nameplate. Note that this project was terminated and never interconnected.
- You have asked that PGE stop its facilities study on Marquam Creek at the application nameplate. Because there is a lower queued project that is dependent on Marquam Creek's project specifications to determine what facilities and upgrades are necessary for it to interconnect, and for the orderly and consistent administration of the interconnection queue, PGE needs to proceed with Marquam Creek's facilities study at the application nameplate.



Kristin Ingram

Pronouns: she/her

Senior Attorney | 503-464-7370 | 503-708-2383 (c)
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From: Greg Adams <Greg@richardsonadams.com>
Sent: Tuesday, January 12, 2021 2:58 PM
To: Kristin Ingram <Kristin.Ingram@pgn.com>; David White <David.White@pgn.com>
Subject: RE: Marquam Creek Solar Interconnection Letter

*****Please take care when opening links, attachments or responding to this email as it originated outside of PGE.*****

Kristin,

To follow up from our call today, a few items:

- If PGE will not agree to the reduced size for Marquam Creek Solar's interconnection as requested in my December 11, 2020 letter, Marquam Creek Solar plans to request the PUC to order that such reduction be allowed, via petition for waiver of the administrative rule or otherwise. In that case, we would like to know if PGE will be willing to support, or at least not oppose such request. As I mentioned, this project is being developed as a community solar facility at this point, and we believe a strong case exists for allowing such reduction in size.
- It is Marquam Creek Solar's understanding that PGE has previously allowed a reduction in size for a prior interconnection customer, QSP0026. However, the studies for this customer are no longer posted on OASIS. We would appreciate PGE's confirmation that this customer was allowed to reduce its size and to see the relevant interconnection studies.
- Marquam Creek Solar would appreciate PGE holding the facilities study in abeyance if PGE is not planning to study the reduced size for the facility as proposed in my letter dated December 11, 2021. However, if the only other alternative is for Marquam Creek Solar to be removed from the interconnection queue, then Marquam Creek Solar would like PGE to proceed with the study as you indicated PGE has begun.

Please contact me with any follow-up responses or questions on this matter. Thanks.

Greg Adams
Richardson Adams, PLLC
515 N. 27th Street
Boise, Idaho 83702
Voice: 208.938.2236
Facsimile: 208.938.7904

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From: Kristin Ingram <Kristin.Ingram@pgn.com>
Sent: Tuesday, January 12, 2021 10:26 AM
To: Greg Adams <Greg@richardsonadams.com>; David White <David.White@pgn.com>
Subject: RE: Marquam Creek Solar Interconnection Letter

Okay! Please call me at (503)708-2383.

Kristin Ingram Attorney | 503-464-7370

From: Greg Adams <Greg@richardsonadams.com>
Sent: Tuesday, January 12, 2021 9:26 AM
To: Kristin Ingram <Kristin.Ingram@pgn.com>; David White <David.White@pgn.com>
Subject: RE: Marquam Creek Solar Interconnection Letter

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I will try to call at 11:00 PST.

Greg Adams
Richardson Adams, PLLC
515 N. 27th Street
Boise, Idaho 83702
Voice: 208.938.2236
Facsimile: 208.938.7904

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From: Kristin Ingram <Kristin.Ingram@pgn.com>
Sent: Tuesday, January 12, 2021 10:21 AM
To: Greg Adams <Greg@richardsonadams.com>; David White <David.White@pgn.com>
Subject: RE: Marquam Creek Solar Interconnection Letter

Hi Greg,

I nominate myself. I am free today between 11-2.

Kristin Ingram Attorney | 503-464-7370

From: Greg Adams <Greg@richardsonadams.com>
Sent: Tuesday, January 12, 2021 9:07 AM
To: Kristin Ingram <Kristin.Ingram@pgn.com>; David White <David.White@pgn.com>
Subject: RE: Marquam Creek Solar Interconnection Letter

*****Please take care when opening links, attachments or responding to this email as it originated outside of PGE.*****

David and Kristin, I would like to have a short follow-up call with you today regarding Marquam Creek

Solar. I'm not sure which of you would be the correct individual to speak to at this point, but if you could let me know who to call and what time would work, I can give you a call. There is no need for non-attorneys on this call. Thanks.

Greg Adams
Richardson Adams, PLLC
515 N. 27th Street
Boise, Idaho 83702
Voice: 208.938.2236
Facsimile: 208.938.7904

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From: Kristin Ingram <Kristin.Ingram@pgn.com>
Sent: Tuesday, December 29, 2020 6:27 PM
To: Greg Adams <Greg@richardsonadams.com>; David White <David.White@pgn.com>
Cc: Kristin Ingram <Kristin.Ingram@pgn.com>
Subject: RE: Marquam Creek Solar Interconnection Letter

Hi Greg,

I am following up on the letter I provided you on December 17th.

Marquam Creek provided PGE with a signed Facilities Study Agreement and deposit. PGE is planning on proceeding with the facilities study at the nameplate provided in Marquam Creek's application. Please let me know on or before January 6, 2021 if Marquam Creek wants PGE to stop carrying out that facilities study.

Thank you.

Kristin Ingram Attorney | 503-464-7370

From: Kristin Ingram <Kristin.Ingram@pgn.com>
Sent: Thursday, December 17, 2020 9:15 AM
To: Greg Adams <Greg@richardsonadams.com>; David White <David.White@pgn.com>
Cc: Kristin Ingram <Kristin.Ingram@pgn.com>
Subject: RE: Marquam Creek Solar Interconnection Letter

Greg,

Please see PGE's attached letter.



Kristin Ingram

Pronouns: she/her

Attorney | 503-464-7370 | 503-708-2383 (c)

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An Oregon kind of energy.

From: Greg Adams <Greg@richardsonadams.com>

Sent: Friday, December 11, 2020 4:29 PM

To: David White <David.White@pgn.com>; Kristin Ingram <Kristin.Ingram@pgn.com>

Subject: Marquam Creek Solar Interconnection Letter

*****Please take care when opening links, attachments or responding to this email as it originated outside of PGE.*****

David and Kristin, Please see the attached letter.

Greg Adams
Richardson Adams, PLLC
515 N. 27th Street
Boise, Idaho 83702
Voice: 208.938.2236
Facsimile: 208.938.7904

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Chris,

PGE has completed the Facilities Study review for the 2.2 MW Goose Creek, LLC. PV Interconnection Application. What follows are the estimated costs and estimated timelines in for the required facilities upgrades previously identified in the previously completed Feasibility Study related to this Interconnection Application.

As has been done previously, the required upgrades can largely be broken into sub-categories: substation and distribution system work. Substation work only includes work that will be completed inside of the substation perimeter fencing. Distribution system work starts at the outside of the substation fencing and includes all work up to and including any work at the site to provide a service connection to PGE's distribution system.

Substation

The substation serving the site is PGE's Eagle Creek Substation. A site walk was held to identify the most cost-effective scope of work required to retrofit the substation to implement the Hot-Line Reclose Blocking protection scheme identified as required in the Feasibility study. During the site walk, it was identified that Eagle Creek is an antiquated substation and what PGE classifies as "Close Confines" equipment; meaning it is quite small. During the site walk it was determined that the existing substation switchgear is too small in order to install the necessary (1) potential transformer (PT) needed to be purchased and installed in order to implement the Hot Line Blocking Scheme. As such, the entire switchgear would need to be replaced along with all breakers, relays, and associated gear.

Estimated cost for the design, procurement, construction, programming, and testing/commissioning for above scope is **\$1,342,784.00**.

Distribution System

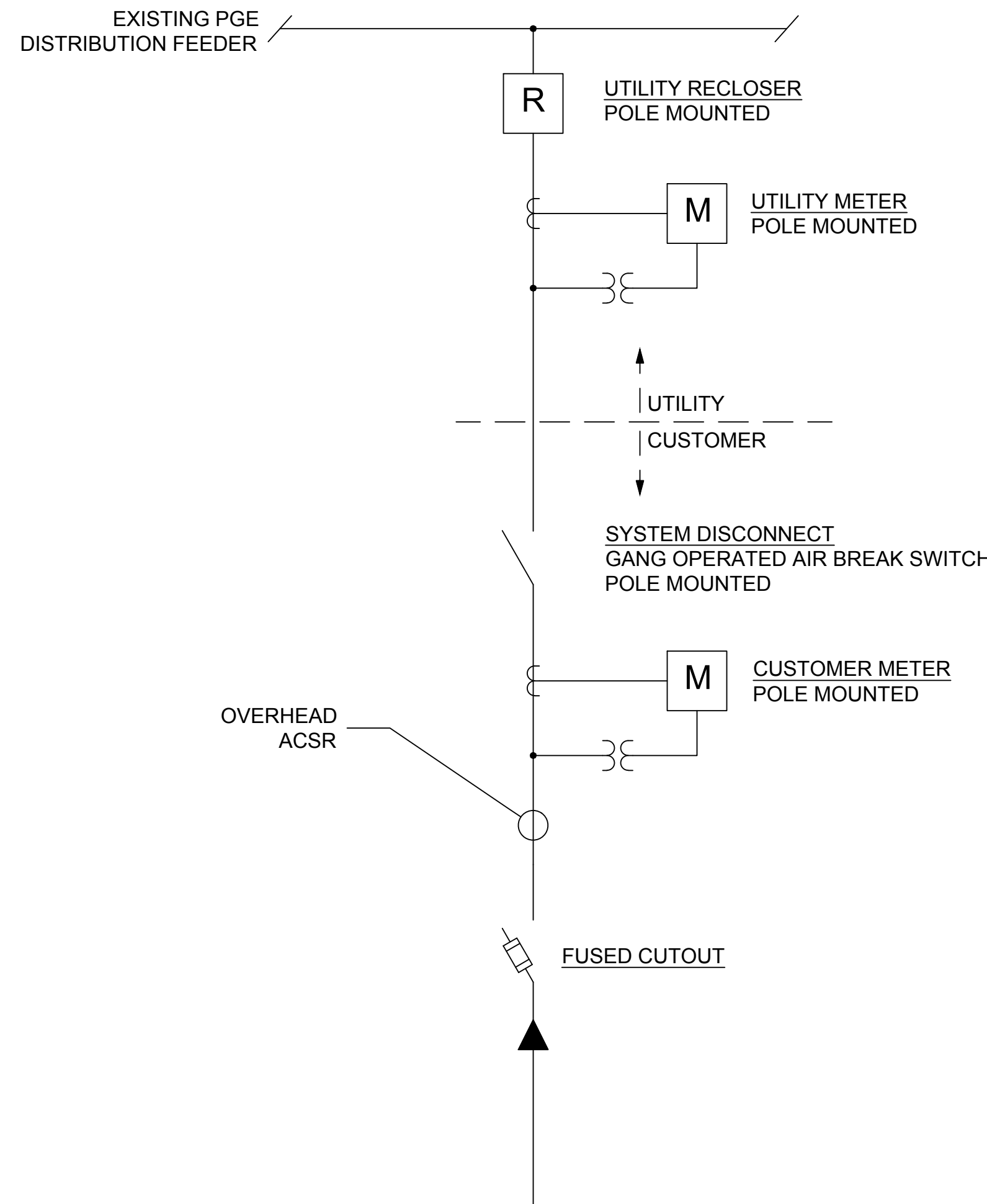
A new 12.47kV distribution service to the site, including the design, materials, and construction of a new 13 kV 3-phase, 4-wire primary voltage metered service to be located within 100 feet of the road will cost approximately **\$35,000.00**.

Distribution System total estimated cost at this time: **\$35,000.00**.

Project Timing

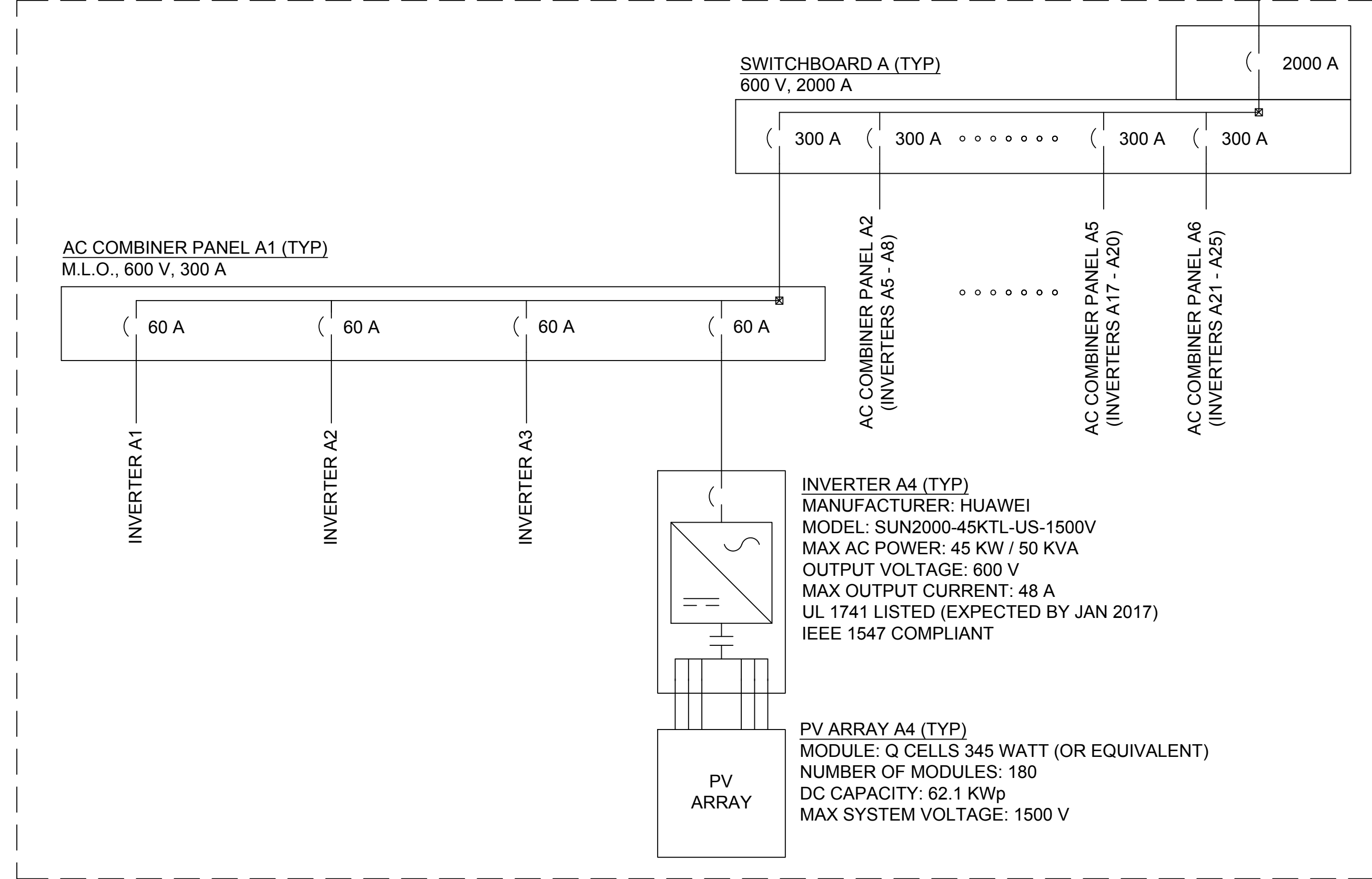
PGE estimates that if an interconnection agreement were executed by the end of April and a payment schedule set forth, the work to design and construct the upgrades mentioned above could be completed by the end of the 2017 calendar year.

Please let me know if you have any questions,



TRANSFORMER A
1250 KVA
PRIMARY VOLTAGE: 12.47 KV
SECONDARY VOLTAGE: 600 V
IMPEDANCE: 5.75%
EXPULSION FUSE AND PRCL FUSES
PRIMARY DISCONNECT SWITCH

ARRAY A (TYP.) - 25 X 45 KW INVERTERS



SYSTEM CAPACITY

AC: 1.13 MW
DC: 1.55 MW

EQUIPMENT

(25) HUAWEI SUN2000-45KTL-US-1500 INVERTERS
(1) 1250 KVA Yg/yg TRANSFORMERS
(4,500) 345 W PV MODULES (OR EQUIVALENT)

INTERCONNECTION VOLTAGE: 12.47 KV

UTILITY: PORTLAND GENERAL ELECTRIC

APPLICANT: GOOSE CREEK SOLAR, LLC

D5 SYSTEM SUMMARY

SCALE: NA

SEAL:

1. ALL EQUIPMENT SHALL BE UL LISTED FOR USE IN SYSTEM CONFIGURATION.
2. INSTALLATION SHALL COMPLY WITH NEC.
3. DC ARRAY SYSTEM SIZE AND CONFIGURATION MAY VARY UPON FINAL DESIGN.
4. MEDIUM VOLTAGE COLLECTION SYSTEM CONFIGURATION IS SUBJECT TO CHANGE BASED UPON FINAL SYSTEM DESIGN.

B5 NOTES

SCALE: NA

ISSUED FOR: INTERCONNECTION APPROVAL NOT FOR CONSTRUCTION

ISSUED: 09/29/2016

DRAWN BY: GBG

DRAWING:

SINGLE LINE DIAGRAM

E-001

A1 SINGLE LINE DIAGRAM

SCALE: NTS

A5 SYMBOLS

SCALE: NA

SHEET 01 OF 01



CONTRACT SUMMARY

* indicates an item that must be completed

* PGE AUDIT NO.	* SUPPLEMENT NO.
69468	00

* PARTIES TO AGREEMENT			* CONTRACT TYPE (check one)			
This agreement is between <input checked="" type="checkbox"/> PGE <input type="checkbox"/> OTHER PGE ENTITY _____ and NAME(S) SP Solar 2, LLC.			<input type="checkbox"/> Fuel Agreement <input type="checkbox"/> Power Purchase & Sales <input type="checkbox"/> Transmission Purchase & Sales <input type="checkbox"/> Generating Plant / Co-Ownerships <input type="checkbox"/> Financial (Debt, Cash, EDI, Guarantee) <input type="checkbox"/> Franchise / Government <input type="checkbox"/> Non-Disclosure <input type="checkbox"/> Joint Pole <input checked="" type="checkbox"/> Tariff (Electric Services) <input type="checkbox"/> Other (specify) _____			
ADDRESS 1111 Hawthorne Lane, Suite 201						
CITY Charlotte	STATE NC	ZIP 28205				
CONTACT: Zoe Gamble Hanes (704)376-2766						
* CONTRACT TITLE Interconnection Agreement for Small Generator Facility			* TOTAL CONTRACT VALUE NOTE: If contract value is zero, please mark as <u>zero</u> . \$ 35,000.00			
CONTRACT DATE 10/25/2016	* EFFECTIVE DATE 12/1/16	EXPIRATION DATE	CONTRACT NO. (if applicable)			
* PURPOSE OF CONTRACT AGREEMENT GOVERNS THE TERMS AND CONDITIONS BY WHICH THE CUSTOMER WILL PROVIDE SOLAR GENERATION UNDER SCHEDULE 203 TO PGE.						
PAYMENT TERMS & CONDITIONS						
ACCOUNTING DISTRIBUTION						
BU	OU	ACCT	CE	DEPT	AWO	FWO
* STAFF CONTACT Lynn Demicheli				* PHONE 464-2554		* DEPT 576
REVIEW & AUTHORIZATION						
NOTE: By pre-arrangement certain supplements or addenda to existing agreements may not need an officer's signature. <input checked="" type="checkbox"/> ◀ CHECK HERE if officer signature is not required and have Department Manager sign below:						
* CONTRACTING OFFICER CAROL DILLIN		* SIGNATURE (RC Manager, if applicable) 			* DATE 12/1/16	
ROUTING						
SEND ORIGINAL AGREEMENT with this ORIGINAL CONTRACT SUMMARY to: RIM, 3WTCFST WITHIN 5 DAYS of contract signing.					 RIM	



Interconnection Agreement for Small Generator Facility Tier 1, Tier 2, Tier 3 or Tier 4 Interconnection

(Small Generator Facilities with Electric Nameplate Capacities of 10 MW or Less)

This Interconnection Agreement (sometimes also referred to as "Agreement") is made and entered into this ___ day of (*month and year*) by and between SP Solar 2, LLC, an individual a company, ("Applicant") and Portland General Electric Company, a corporation existing under the laws of the State of Oregon, ("PGE"). Applicant and PGE each may be referred to as a "Party," or collectively as the "Parties."

Recitals:

Whereas, the Applicant is proposing to develop a Small Generator Facility, or to add generating capacity to an existing Small Generator Facility, consistent with the Application completed on August 4, 2015;

Whereas, the Applicant desires to interconnect the Small Generator Facility with PGE's Transmission and Distribution System (T&D System); and

Whereas, the Agreement shall be used for all approved Tier 1, Tier 2, Tier 3 and Tier 4 Interconnection Applications according to the procedures set forth in OPUC Rule OAR 860, Division 082 (Rule). Terms with initial capitalization, when used in this Agreement, shall have the meanings given in the Rule and, to the extent this Agreement conflicts with the Rule, the Rule shall take precedence.

Now, therefore, in consideration of and subject to the mutual covenants contained herein, the Parties agree as follows:

Article 1. **Scope and Limitations of Agreement**

1.1 Scope

The Agreement establishes standard terms and conditions approved by the Commission under which the Small Generator Facility with a Nameplate Capacity of 10 MW or less will interconnect to, and operate in parallel with PGE's T&D System. Additions, deletions or changes to the standard terms and conditions of an Interconnection Agreement will not be permitted unless they are mutually agreed to by the Parties or approved by the Commission if required by the Rule.

1.2 Power Purchase

The Agreement does not constitute an agreement to purchase, transmit, or deliver the Applicant's power nor does it constitute an electric service agreement.

1.3 Other Agreements

Nothing in the Interconnection Agreement is intended to affect any other agreement between PGE and the Applicant or another Interconnection Customer. However, in the event that the provisions of the Agreement are in conflict with the provisions of other PGE tariffs, PGE tariff shall control.

1.4 Responsibilities of the Parties

- 1.4.1 The Parties shall perform all obligations of this Agreement in accordance with all applicable laws.
- 1.4.2 The Applicant will construct, own, operate, and maintain its Small Generator Facility in accordance with the Agreement, IEEE Standard 1547 (2003 ed), the National Electrical Code (2005 ed) and applicable standards required by the Commission.
- 1.4.3 Each Party shall be responsible for the safe installation, maintenance, repair and condition of their respective lines and appurtenances on their respective sides of the Point of Interconnection. Each Party shall provide Interconnection Facilities that adequately protect the other Parties' facilities, personnel, and other persons from damage and injury. The allocation of responsibility for the design, installation, operation, maintenance and ownership of Interconnection Facilities is prescribed in the Rule.

1.5 Parallel Operation and Maintenance Obligations

Once the Small Generator Facility has been authorized to commence Parallel Operation by execution of the Interconnection Agreement, the Applicant will abide by all written provisions for operating and maintenance as required by the Rule and detailed by PGE in Form 7, title "**Interconnection Equipment As Built Specifications, Initial Settings and Operating Requirements**" a copy of which is provided on PGE's website.

1.6 Metering and Monitoring

The Interconnection Customer will be responsible for metering and monitoring as required by OAR 860-082-0070.

1.7 Power Quality

The Applicant will design its Small Generator Facility to maintain a composite power delivery at continuous rated power output at the Point of Interconnection that meets the requirements set forth in IEEE 1547. PGE may, in some circumstances, also require the Applicant to follow voltage or VAR schedules used by similarly situated, comparable generators in the control area. Any special operating requirements will be detailed in Form 7 provided on the Commission website and completed by PGE as required by the Rule. Under no circumstances shall these additional requirements for voltage or reactive power support exceed the normal operating capabilities of the Small Generator Facility. For purposes of this Agreement, "control area" shall mean an electrical system or systems bounded by interconnection metering and telemetry, capable of controlling generation to maintain its interchange schedule with other control areas and contributing to frequency regulation of the interconnection.

Article 2. Inspection, Testing, Authorization, and Right of Access**2.1 Equipment Testing and Inspection**

The Applicant will test and inspect its Small Generator Facility Facilities prior to interconnection in accordance with IEEE 1547 Standards as provided for in the Rule. The Interconnection will not be final until the Witness Test and Certificate of Completion provisions in the Rule have been satisfied. Operation of the Small Generator Facility requires an-Interconnection Agreement; electricity sales require a Power Purchase Agreement.—To the extent that the Applicant decides to conduct interim testing of the Small Generator Facility prior to the Witness Test, it may request that PGE observe these tests and that these tests be deleted from the final Witness Test. If PGE agrees to send

qualified personnel to the Small Generator Facility to observe such interim testing, it will be doing so at its own expense unless the Parties agree otherwise

2.2 Right of Access

As provided in OAR 860-082-0020, PGE will have access to the Applicant's premises for any reasonable purpose in connection with the Interconnection Application and any Interconnection Agreement that is entered in to pursuant to this Rule or if necessary to meet the legal obligation to provide service to its customers. Access will be requested at reasonable hours and upon reasonable notice, or at any time without notice in the event of an emergency or hazardous condition.

Article 3. Effective Date, Term, Termination, and Disconnection

3.1 Effective Date

The Agreement shall become effective upon execution by the Parties.

3.2 Term of Agreement

The Agreement will be effective on the Effective Date and will remain in effect for a period of twenty (20) years or the life of the Power Purchase Agreement, whichever is shorter or a period mutually agreed to by Parties, unless terminated earlier by the default or voluntary termination by the Interconnection Customer or by action of the Commission.

3.3 Termination

No termination will become effective until the Parties have complied with all applicable laws and any clauses of the Rule or this Agreement applicable to such termination.

3.3.1 The Applicant may terminate this Agreement at any time by giving PGE twenty (20) business days written notice.

3.3.2 Either Party may terminate this Agreement after default pursuant to Article 5.6 of this Agreement.

3.3.3 The Commission may order termination of this Agreement.

3.3.4 Upon termination of this Agreement, the Small Generator Facility will be disconnected from PGE's T&D System at the Applicant's expense. The termination of this Agreement will not relieve either Party of its liabilities and obligations, owed or continuing at the time of the termination.

3.3.4 The provisions of this Article shall survive termination or expiration of this Agreement.

3.4 Temporary Disconnection

PGE or the Applicant may temporarily disconnect the Small Generator Facility from its T&D System for so long as reasonably necessary, as provided in OAR 860-082-0075 of the Rule, in the event one or more of the following conditions or events occurs:

3.4.1 Under emergency conditions, PGE or the Interconnection Customer may immediately suspend interconnection service and temporarily disconnect the Small Generator Facility. PGE shall notify the Applicant promptly when it becomes aware of an emergency condition that may reasonably be expected to affect the Small Generator Facility operation. The Applicant will notify PGE promptly when it becomes aware of an emergency condition that may reasonably be expected to affect PGE's T&D System. To the extent information is known, the notification shall describe the emergency condition, the extent of the damage or deficiency, the expected effect on the operation of both Parties' facilities and operations, its anticipated duration, and the necessary corrective action.

- 3.4.2 For routine Maintenance, Parties will make reasonable efforts to provide five (5) business days notice prior to interruption caused by routine maintenance or construction and repair to the Small Generator Facility or PGE's T&D system and shall use reasonable efforts to coordinate such interruption.
- 3.4.3 For Forced outages of the T&D System, PGE shall use reasonable efforts to provide the Applicant with prior notice of forced outages to effect immediate repairs to the T&D System. If prior notice is not given, PGE shall, upon request, provide the Applicant written documentation after the fact explaining the circumstances of the disconnection.
- 3.4.4 For disruption or deterioration of service, where PGE determines that operation of the Small Generator Facility will likely cause disruption or deterioration of service to other customers served from the same electric system, or if operating the Small Generator Facility could cause damage to PGE's T&D System, PGE may disconnect the Small Generator Facility. PGE will provide the Applicant upon request all supporting documentation used to reach the decision to disconnect. PGE may disconnect the Small Generator Facility if, after receipt of the notice, the Applicant fails to remedy the adverse operating effect within a reasonable time which shall be at least five (5) business days from the date the Applicant receives PGE's written notice supporting the decision to disconnect, unless emergency conditions exist, in which case the provisions of 3.4.1 of the Agreement apply.
- 3.4.5 If the Applicant makes any change other than Minor Equipment Modifications without prior written authorization of PGE, PGE will have the right to temporarily disconnect the Small Generator Facility.

3.5 Restoration of Interconnection

The Parties shall cooperate with each other to restore the Small Generator Facility, Interconnection Facilities, and PGE's T&D System to their normal operating state as soon as reasonably practicable following any disconnection pursuant to section 3.4.

Article 4. Cost Responsibility and Billing

The Applicant is responsible for the application fee and for such facilities, equipment, modifications and upgrades as required in 860-082-0035.

4.1 Minor T&D System Modifications

Modifications to the existing T&D System identified by PGE and set forth in Attachment A, such as changing meters, fuses or relay settings, are deemed Minor Modifications. It is PGE's sole discretion to decide what constitutes a Minor Modification. The Applicant will bear the costs of making such Minor Modifications as may be necessary to gain approval of an Application.

4.2 Interconnection Facilities

PGE will identify, under the study procedures of an Application review, the Interconnection Facilities necessary to safely interconnect the Small Generator Facility with PGE. Attachment A itemizes the Interconnection Facilities for the Applicant, including the cost of the facilities and the time required to build and install those facilities. The Applicant is responsible for the cost of the Interconnection Facilities.

4.3 Interconnection Equipment

The Applicant is responsible for all reasonable expenses, including overheads, associated with owning, operating, maintaining, repairing, and replacing its Interconnection Equipment.

4.4 System Upgrades

PGE will design, procure, construct, install, and own any System Upgrades. The actual cost of the System Upgrades, including overheads, is set forth in Attachment A and will be directly assigned to the Applicant. An Interconnection Customer may be entitled to financial compensation from other PGE Interconnection Customers who, in the future, benefit from the System Upgrades paid for by the Interconnection Customer. Such compensation will be governed by separate rules promulgated by the Commission or by terms of a tariff filed and approved by the Commission. Such compensation will only be available to the extent provided for in the separate rules or tariff.

4.5 Adverse System Impact

PGE is responsible for identifying Adverse System Impacts on any Affected Systems and for determining what mitigation activities or upgrades may be required to accommodate a Small Generator Facility. The actual cost of any actions taken to address the Adverse System Impacts, including overheads, shall be directly assigned to the Applicant. The Applicant may be entitled to financial compensation from other public utilities or other Interconnection Customers who, in the future, utilize the upgrades paid for by the Applicant, to the extent as allowed by the Commission. Adverse System Impacts are set forth in Attachment A.

4.6 Billings

PGE may require a deposit of not more than 50% of the cost estimate, not to exceed \$1,000, to be paid up front by the Applicant for studies necessary to complete an Application and to interconnect the Small Generator Facility to the T&D System. PGE may require a deposit of no more than 25% of the estimated costs, not to exceed \$10,000, for Interconnection Facilities necessary to complete an Application and to interconnect the Small Generator Facility to the T&D System. Progress billing, final billing and payment schedules must be agreed to by Parties prior to commencing work.

Article 5. Assignment, Liability, Indemnity, Force Majeure, Consequential Damages, and Default**5.1 Assignment**

The Interconnection Agreement may be assigned by either Party upon fifteen (15) business days prior written notice. Except as provided in Articles 5.1.1 and 5.1.2, said assignment shall only be valid upon the prior written consent of the non-assigning Party, which consent shall not be unreasonably withheld.

5.1.1 Either Party may assign the Agreement without the consent of the other Party to any affiliate (which shall include a merger of the Party with another entity), of the assigning Party with an equal or greater credit rating and with the legal authority and operational ability to satisfy the obligations of the assigning Party under this Agreement;

5.1.2 The Applicant shall have the right to assign the Agreement, without the consent of PGE, for collateral security purposes to aid in providing financing for the Small Generator Facility. For Small Generator systems that are integrated into a building facility, the sale of the building or property will result in an automatic transfer of the Agreement to the new owner who shall be responsible for complying with the terms and conditions of this Agreement.

5.1.3 Any attempted assignment that violates this Article is void and ineffective. Assignment shall not relieve a Party of its obligations, nor shall a Party's

obligations be enlarged, in whole or in part, by reason thereof. An assignee is responsible for meeting the same obligations as the Applicant.

5.2 Limitation of Liability and Consequential Damages

A Party is liable for any loss, cost claim, injury, or expense including reasonable attorney's fees related to or arising from any act or omission in its performance of the provisions of an Interconnection Agreement entered into pursuant to the Rule except as provided for in ORS 757.300(4)(c). Neither Party will seek redress from the other Party in an amount greater than the amount of direct damage actually incurred.

5.3 Indemnity

- 5.3.1 This provision protects each Party from liability incurred to third parties as a result of carrying out the provisions of the Agreement. Liability under this provision is exempt from the general limitations on liability found in Article 5.2.
- 5.3.2 Each Party shall, to the extent allowed by law, and subject to the limitations imposed by ORS 30.260 to ORS 30.300, if applicable, at all times indemnify, defend, and hold the other Party harmless from, any and all damages, losses, claims, including claims and actions relating to injury to or death of any person or damage to property, demands, suits, recoveries, costs and expenses, court costs, attorney fees at trial and on appeal, and all other obligations by or to third parties (hereinafter "Harm"), arising out of or resulting from its negligent action or failure to meet its obligations under this Agreement. Such indemnity obligation shall be limited to the proportional extent the Harm is caused by the negligence of the indemnified Party.
- 5.3.3 If an indemnified person is entitled to indemnification under this Article as a result of a claim by a third party, and the indemnifying Party fails, after notice and reasonable opportunity to proceed under this Article, to assume the defense of such a claim, such indemnified person may at the expense of the indemnifying Party contest, settle or consent to the entry of any judgment with respect to, or pay in full, such claim.
- 5.3.4 If an indemnifying party is obligated to indemnify and hold any indemnified person harmless under this Article, the amount owing to the indemnified person shall be the amount of such indemnified person's actual loss, net of any insurance or other recovery.
- 5.3.5 Promptly after receipt by an indemnified person of any claim or notice of the commencement of any action or administrative or legal proceeding or investigation as to which the indemnity provided for in this Article may apply, the indemnified person shall notify the indemnifying party of such fact. Any failure of or delay in such notification shall not affect a Party's indemnification obligation unless such failure or delay is materially prejudicial to the indemnifying party.
- 5.3.6 The indemnifying Party shall have the right to assume the defense thereof with counsel designated by such indemnifying Party and reasonably satisfactory to the indemnified person. If the defendants in any such action include one or more indemnified persons and the indemnifying Party and if the indemnified person reasonably concludes that there may be legal defenses available to it and/or other indemnified persons which are different from or additional to those available to the indemnifying Party, the indemnified person shall have the right to select separate counsel to assert such legal defenses and to otherwise participate in the defense of such action on its own behalf. In such instances, the indemnifying

Party shall only be required to pay the fees and expenses of one additional attorney to represent an indemnified person or indemnified persons having such differing or additional legal defenses.

- 5.3.7 The indemnified person shall be entitled, at its expense, to participate in any such action, suit or proceeding, the defense of which has been assumed by the indemnifying Party. Notwithstanding the foregoing, the indemnifying Party (i) shall not be entitled to assume and control the defense of any such action, suit or proceedings if and to the extent that, in the opinion of the indemnified person and its counsel, such action, suit or proceeding involves the potential imposition of criminal liability on the indemnified person, or there exists a conflict or adversity of interest between the indemnified person and the indemnifying Party, in such event the indemnifying Party shall pay the reasonable expenses of the indemnified person, and (ii) shall not settle or consent to the entry of any judgment in any action, suit or proceeding without the consent of the indemnified person, which shall not be reasonably withheld, conditioned or delayed.

5.4 Consequential Damages

Neither Party shall be liable to the other Party, under any provision of the Agreement, for any losses, damages, costs or expenses for any special, indirect, incidental, consequential, or punitive damages, including but not limited to loss of profit or revenue, loss of the use of equipment, cost of capital, cost of temporary equipment or services, whether based in whole or in part in contract, in tort, including negligence, strict liability, or any other theory of liability; provided, however, that damages for which a Party may be liable to the other Party under another agreement will not be considered to be special, indirect, incidental, or consequential damages hereunder.

5.5 Force Majeure

- 5.5.1 As used in this Agreement, a Force Majeure Event shall mean “any act of God, labor disturbance, act of the public enemy, war, acts of terrorism, insurrection, riot, fire, storm or flood, explosion, breakage or accident to machinery or equipment through no direct, indirect, or contributory act of a Party, any order, regulation or restriction imposed by governmental, military or lawfully established civilian authorities, or any other cause beyond a Party’s control. A Force Majeure Event does not include an act of negligence or intentional wrongdoing.”
- 5.5.2 If a Force Majeure Event prevents a Party from fulfilling any obligations under this Agreement, the Party affected by the Force Majeure Event (Affected Party) shall promptly notify the other Party of the existence of the Force Majeure Event. The notification must specify in reasonable detail the circumstances of the Force Majeure Event, its expected duration, and the steps that the Affected Party is taking to mitigate the effects of the event on its performance, and if the initial notification was verbal, it should be promptly followed up with a written notification. The Affected Party shall keep the other Party informed on a continuing basis of developments relating to the Force Majeure Event until the event ends the Affected Party will be entitled to suspend or modify its performance of obligations under this Agreement (other than the obligation to make payments) only to the extent that the effect of the Force Majeure Event cannot be reasonably mitigated. The Affected Party will use reasonable efforts to resume its performance as soon as possible. The Parties shall immediately report to the Commission should a Force Majeure

Event prevent performance of an action required by Rule that the Rule does not permit the Parties to mutually waive.

5.6 Default

- 5.6.1 No default shall exist where such failure to discharge an obligation (other than the payment of money) is the result of a Force Majeure Event as defined in this Agreement, or the result of an act or omission of the other Party. Upon a default, the non-defaulting Party shall give written notice of such default to the defaulting Party. Except as provided in Article 5.6.2, the defaulting Party shall have sixty (60) calendar days from receipt of the default notice within which to cure such default; provided however, if such default is not capable of cure within sixty (60) calendar days, the defaulting Party shall commence such cure within twenty (20) calendar days after notice and continuously and diligently complete such cure within six (6) months from receipt of the default notice; and, if cured within such time, the default specified in such notice shall cease to exist.
- 5.6.2 If a default is not cured as provided for in this Article, or if a default is not capable of being cured within the period provided for herein, the non-defaulting Party shall have the right to terminate the Agreement by written notice at any time until cure occurs, and be relieved of any further obligation hereunder and, whether or not that Party terminates the Agreement, to recover from the defaulting Party all amounts due hereunder, plus all other damages and remedies to which it is entitled at law or in equity. Alternately, the non-defaulting Party shall have the right to seek dispute resolution pursuant to Article 7 with the Commission in lieu of default. The provisions of this Article will survive termination of the Agreement.

Article 6. Insurance

A Party is liable for any loss, cost claim, injury, or expense including reasonable attorney's fees related to or arising from any act or omission in its performance of the provisions of this Rule or the Interconnection Agreement entered into pursuant to this Rule.

- 6.1 Pursuant to the Rule adopted by the Commission, PGE may not require the Interconnection Customer to maintain general liability insurance in relation to the interconnection of a Small Generator Facility with an Electric Nameplate Capacity of 200 kW or less. With regard to the interconnection of a Small Generator Facility with an Electric Nameplate Capacity equal to or less than 10 MW but in excess of 200 kW, the Interconnection Customer shall, at its own expense, maintain in force throughout the period of this Agreement general liability insurance sufficient to protect any person (including PGE) who may be affected by the Interconnection Customer's Small Generator Facility and its operation and such insurance shall be sufficient to satisfy the Interconnection Customer's indemnification responsibilities under Article 5.3 of this Agreement.
- 6.2 Within ten (10) business days following execution of this Agreement, and as soon as practicable after the end of each fiscal year or at the renewal of the insurance policy and in any event within ninety (90) calendar days thereafter, the Interconnection Customer shall provide the Public Utility with certification of all insurance required in this Agreement, executed by each insurer or by an authorized representative of each insurer.
- 6.3 All insurance required by this Article 6 shall name the Public, its parent, associated and Affiliate companies and their respective directors, officers, agents, servants and employees ("Other Party Group") as additional insured. All policies shall contain provisions whereby

the insurers waive all rights of subrogation against the Other Party Group and provide thirty (30) calendar days advance written notice to the Other Party Group prior to anniversary date of cancellation or any material change in coverage or condition. The Interconnection Customer's insurance shall contain provisions that specify that the policies are primary and shall apply to such extent without consideration for other policies separately carried and shall state that each insured is provided coverage as though a separate policy had been issued to each, except the insurer's liability shall not be increased beyond the amount for which the insurer would have been liable had only one insured been covered. The insurance policies, if written on a Claims First Made Basis, shall be maintained in full force and effect for two (2) years after termination of this Agreement, which coverage may be in the form of tail coverage or extended reporting period coverage if agreed by the Parties.

- 6.4 The Parties agree to report to each other in writing as soon as practical all accidents or occurrences resulting in injuries to any person, including death, and any property damage arising out of this Agreement.
- 6.5 The requirements contained herein as to insurance are not intended to and shall not in any manner limit or qualify the liabilities and obligations assumed by the Parties under this Agreement.

Article 7. Dispute Resolution

Parties will adhere to the dispute resolution provisions in OAR 860-082-0080.

Article 8. Miscellaneous

8.1 Governing Law, Regulatory Authority, and Rules

The validity, interpretation and enforcement of the Agreement and each of its provisions shall be governed by the laws of the State of Oregon, without regard to its conflicts of law principles. The Agreement is subject to all applicable laws. Each Party expressly reserves the right to seek changes in, appeal, or otherwise contest any laws, orders, or regulations of a governmental authority.

8.2 Amendment

The Parties may mutually agree to amend the Agreement by a written instrument duly executed by both Parties in accordance with provisions of the Rule and applicable Commission Orders and provisions of the laws if the State of Oregon.

8.3 No Third-Party Beneficiaries

The Agreement is not intended to and does not create rights, remedies, or benefits of any character whatsoever in favor of any persons, corporations, associations, or entities other than the Parties, and the obligations herein assumed are solely for the use and benefit of the Parties, their successors in interest and where permitted, their assigns.

8.4 Waiver

- 8.4.1 The failure of a Party to the Agreement to insist, on any occasion, upon strict performance of any provision of the Agreement will not be considered a waiver of any obligation, right, or duty of, or imposed upon, such Party.
- 8.4.2 The Parties may agree to mutually waive a section of this Agreement so long as prior Commission approval of the waiver is not required by the Rule.
- 8.4.3 Any waiver at any time by either Party of its rights with respect to the Agreement shall not be deemed a continuing waiver or a waiver with respect to any other

failure to comply with any other obligation, right, or duty of the Agreement. Any waiver of the Agreement shall, if requested, be provided in writing.

8.5 Entire Agreement

The Interconnection Agreement, including any supplementary Form attachments that may be necessary, constitutes the entire Agreement between the Parties with reference to the subject matter hereof and supersedes all prior and contemporaneous understandings or agreements, oral or written, between the Parties with respect to the subject matter of the Agreement. There are no other agreements, representations, warranties, or covenants that constitute any part of the consideration for, or any condition to, either Party's compliance with its obligations under the Agreement.

8.6 Multiple Counterparts

The Agreement may be executed in two or more counterparts, each of which is deemed an original but all constitute one and the same instrument.

8.7 No Partnership

The Agreement will not be interpreted or construed to create an association, joint venture, agency relationship, or partnership between the Parties or to impose any partnership obligation or partnership liability upon either Party. Neither Party shall have any right, power or authority to enter into any agreement or undertaking for, or act on behalf of, or to act as or be an agent or representative of, or to otherwise bind, the other Party.

8.8 Severability

If any provision or portion of the Agreement shall for any reason be held or adjudged to be invalid or illegal or unenforceable by any court of competent jurisdiction or other governmental authority; (1) such portion or provision shall be deemed separate and independent; (2) the Parties shall negotiate in good faith to restore insofar as practicable the benefits to each Party that were affected by such ruling; and (3) the remainder of the Agreement shall remain in full force and effect.

8.9 Subcontractors

Nothing in the Agreement shall prevent a Party from utilizing the services of any subcontractor, or designating a third party agent as one responsible for a specific obligation or act required in the Agreement (collectively subcontractors), as it deems appropriate to perform its obligations under the Agreement; provided, however, that each Party will require its subcontractors to comply with all applicable terms and conditions of the Agreement in providing such services and each Party will remain primarily liable to the other Party for the performance of such subcontractor.

8.9.1 The creation of any subcontract relationship shall not relieve the hiring Party of any of its obligations under the Agreement. The hiring Party shall be fully responsible to the other Party for the acts or omissions of any subcontractor the hiring Party hires as if no subcontract had been made. Any applicable obligation imposed by the Agreement upon the hiring Party shall be equally binding upon, and will be construed as having application to, any subcontractor of such Party.

8.9.2 The obligations under this Article will not be limited in any way by any limitation of subcontractor's insurance.

8.10 Reservation of Rights

Either Party will have the right to make a unilateral filing with the Commission to modify the Interconnection Agreement. This reservation of rights provision will include but is not limited to modifications with respect to any rates terms and conditions, charges, classification of service, rule or regulation under tariff rates or any applicable State or

Federal law or regulation. Each Party shall have the right to protest any such filing and to participate fully in any proceeding before the Commission in which such modifications may be considered.

Article 9. Notices and Records

9.1 General

Unless otherwise provided in the Agreement, any written notice, demand, or request required or authorized in connection with the Agreement shall be deemed properly given if delivered in person, delivered by recognized national courier service, or sent by first class mail, postage prepaid, to the person specified below:

If to the Applicant:

Applicant: Pine Gate Renewables, LLC
Attention: Zoe Hanes
Address: 1111 Hawthorne Lane, Suite 201
City: Charlotte State: NC Zip: 28205
Phone: 704-376-2766
Fax: _____
E-mail zhanes@pgrenewables.com

If to PGE:

Attention: Small Power Production Coordinator
Address: 121 SW Salmon St., 3WTC0402.
City: Portland State: OR Zip: 97204
Phone: 503-464-7945
Fax: 503-464-2115
E-mail: small.power.production@pgn.com

9.2 Records

The utility will maintain a record of all Interconnection Agreements and related Form attachments for as long as the interconnection is in place as required by OAR 860-082-065. PGE will provide a copy of these records to the Applicant or Interconnection Customer within fifteen (15) business days if a request is made in writing.

9.3 Billing and Payment

Billings and payments shall be sent to the addresses set out below:

If to the Applicant (complete if different than Article 9.1 above):

Applicant: _____
Attention: _____
Address: _____
City: _____ State: _____ Zip: _____

If to PGE:

Attention: _____
Address: _____
City: _____ State: _____ Zip: _____

9.4 Designated Operating Representative

The Parties will designate operating representatives to conduct the communications which may be necessary or convenient for the administration of the operations provisions of the Agreement. This person will also serve as the point of contact with respect to operations and maintenance of the Party's facilities:

Applicant's Operating Representative (complete if different than Article 9.1 above):

Attention: _____
Address: _____
City: _____ State: _____ Zip: _____
Phone: _____
Fax: _____
E-mail: _____

PGE's Operating Representative:

Attention: Small Power Production Coordinator
Address: 121 SW Salmon St., 3WTC0402.
City: Portland State: OR Zip: 97204
Phone: 503-464-7945
Fax: 503-464-2115
E-mail: small.power.production@pgn.com


9.5 Changes to the Notice Information

Either Party may change this notice information by giving five (5) business days written notice prior to the effective date of the change.

Article 10. Signatures

IN WITNESS WHEREOF, the Parties have caused the Agreement to be executed by their respective duly authorized representatives.

For the Applicant:


Signature: 

Printed Name: James Luster

Title (if applicable): Manager

Date: 10/25/2016

For PGE:

Signature: 

Printed Name: Jim Cox

Title: Director

Date: 12/1/16

Attachment A

Description and Costs of Minor Modifications, Interconnection Facilities,
System Upgrades, and Adverse System Impacts

Distribution service:

Design and construct new 12.47 kV 3-phase, 4-wire distribution service to site.

Distribution System estimated cost at this time: **\$35,000.00.**

Total estimated cost: **\$35,000.00**

Attachment B**Description of Interconnection Facilities
and Metering Equipment Operated or Maintained by the Public Utility**

PGE will provide description and best estimate itemized cost, including overheads, to operate and maintain the Interconnection Facilities and metering equipment for the interconnected small generator (if applicable).

PGE will only own the following interconnection equipment at the site:

- Primary voltage service conductors from PGE's area feeder circuit to the termination point in PV plant's switchgear, and
- Metering equipment (Meter, potential transformers, current transformers and associated wiring) that will be installed in the applicant-supplied switchgear.

There is no routine maintenance that PGE would conduct on the aforementioned equipment. If at any time they were damaged or otherwise needed maintenance, the applicant, or any subsequent assignees of this agreement, is responsible for those costs at that time. If at any point, the applicant wishes to make any changes to the interconnection facilities that requires PGE personnel or equipment, the applicant is responsible for all costs at that time.

Attachment C

One-Line Diagram

One-line diagram depicting the Generator Facility, Interconnection Facilities, metering equipment, and upgrades including safety lockout features and any special accessibility requirements.

To be filled in with as-built drawings later

Attachment D

Scope of Work/Milestones

In-Service Date: TBD by pending discussions between developer and PGE

Critical milestones and responsibility as agreed to by the Parties:

	Milestone/Date	Responsible Party
(1)	_____	_____
(2)	_____	_____
(3)	_____	_____
(4)	_____	_____
(5)	_____	_____
(6)	_____	_____
(7)	_____	_____
(8)	_____	_____
(9)	_____	_____
(10)	_____	_____

Attachment E

Additional Operating Requirements