

BEFORE THE PUBLIC UTILITY COMMISSION

OF OREGON

UM 1631

In the Matter of

Carnes Creek Solar, LLC,

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

PETITION FOR WAIVER FOR
CARNES CREEK SOLAR, LLC

I. INTRODUCTION

Carnes Creek Solar, LLC (“Carnes Creek” or “Project”) is a 2.5 megawatt (“MW”) solar qualifying facility (“QF”) that has been conditionally pre-certified by the Commission to participate in Oregon’s Community Solar Program (“CSP”) in Portland General Electric Company’s (“PGE”) service territory (CSP Project ID: PGE-2020-56). The Project is seeking an order from the Public Utility Commission of Oregon (“Commission”) granting waiver of OAR 860-082-0025(1)(b) & (c). OAR 860-082-0025(1)(b) & (c) relate to whether a Small Generator Interconnection Customer is required to submit a new interconnection application when proposing changes, other than a minor equipment modification, to its facility. Changes necessitating the submittal of a new application include changes affecting the nameplate capacity of the proposed facility. Carnes Creek respectfully requests waiver of these rules so that the Project can reduce its nameplate capacity by up to 199 kilowatts as is allowed by the CSP rules so that the Project can avoid interconnection upgrades that are unnecessary if the Project is able to reduce its nameplate capacity. In requesting this waiver, Carnes Creek does not ask the Commission to make a technical decision, but simply to waive OAR 860-082-

0025(1)(b) & (c), so that Carnes Creek can request that PGE accept its nameplate capacity reduction up to the amount of the amount allowed under the CSP. Carnes Creek's waiver request is in the public interest because it will allow Carnes Creek to move forward in the CSP program and provide meaningful choices to customers and new project development. Further, the unusual circumstances facing Carnes Creek with this initial launch of the CSP program and changes to land use requirements were not anticipated at the time OAR 860-082-0025(1)(b) & (c) were adopted.

Carnes Creek requests that this waiver request be considered at the May 5, 2020 public meeting. Just before submitting this waiver request, Carnes Creek heard from PGE, that PGE is not agreeable to requesting a waiver.

II. FACTUAL BACKGROUND

The Project originally applied for interconnection on January 29, 2018 pursuant to the Small Generator Interconnection Rules in OAR 860-082 to interconnect a 2.50 MW solar facility on PGE's Waconda-13 distribution feeder located in Marion County, Oregon connected to PGE's Waconda substation. Carnes Creek signed and returned an interconnection agreement to PGE, along with a \$10,000 deposit, on April 26, 2019. The interconnection agreement obligated Carnes Creek to pay \$101,103 for necessary interconnection facilities and system upgrades. PGE countersigned the interconnection agreement on May 6, 2019.

On July 9, 2019, however, PGE informed Carnes Creek that its interconnection would need to be restudied as a result of a higher queued project withdrawing from the queue. In its notice, PGE stated its engineering team determined the location of the withdrawn project required a restudy of Carnes Creek to "ensure the interconnection

requirements are properly allocated.” On July 18, 2019, Carnes Creek acknowledged PGE’s notice and agreed to PGE conducting a new System Impact Study (“SIS”) to restudy the interconnection. PGE acknowledged Carnes Creek’s agreement to proceed the following day on July 19, 2019, and since then the interconnection agreement between Carnes Creek and PGE still stands.

PGE provided Carnes Creek a new SIS on October 25, 2019. The cost estimate given by PGE in the new SIS was \$768,900, of which \$738,900 is for protection and fiber optic communication requirements to prevent generation from Carnes Creek from backfeeding into the substation transformer and onto PGE’s transmission system where such backfeeding could create adverse system impacts. This dramatic increase in cost, which came late in the development process, could be substantially mitigated if the project can be re-sized to mitigate the backfeed condition. Specifically, PGE’s interconnection standard requires such protection and communication requirements when generation from an interconnection customer exceeds the minimum daytime load (“MDL”) of the substation transformer.¹ Therefore, Carnes Creek can avoid these significant interconnection costs if the Project can be sized appropriately such that it will not exceed the MDL of the substation transformer. The remaining \$30,000 of PGE’s cost estimate is for distribution modifications to properly service the Project which are

¹ Portland Gen. Elec. Co., Distribution Interconnection Standards, §§ 2.2.4, 2.2.4.5, 2.2.4.6 (June 17, 2019), *available at* https://www.oasis.oati.com/woa/docs/PGE/PGEdocs/PGE_Distribution_Interconnection_Standards.pdf.

ordinarily required for other Tier 4 generators. The new SIS did not identify any other distribution system requirements necessary for Carnes Creek to interconnect.

As background, PGE and Carnes Creek disagree about the appropriate MDL because PGE initially included the wrong number in its new SIS, and there is a difference of opinion regarding the appropriate technical method for determining the MDL. Carnes Creek is not requesting that the Commission resolve any technical issues or cost estimates, but is providing relevant background information to illustrate why the waiver request should be granted so that Carnes Creek can reduce its capacity to be below the MDL. The new SIS initially cited 1.34 MW as the MDL occurring on May 28, 2019, and PGE showed that a higher queued project (SPQ0028) with a nameplate capacity of 2.2 MW was commissioned into service on October 4, 2019. This means the higher queued project would already cause a backfeeding condition and per PGE’s interconnection standard and the Small Generator Interconnection Rules should have been responsible for the upgrade. After Carnes Creek inquired into this discrepancy, PGE responded stating that the initial MDL number cited in the new SIS was incorrect, that the correct MDL was 2.4 MW on May 5, 2019, and PGE provided a newly revised SIS with the “correct” MDL number.²

Carnes Creek also hired an engineer to assist in an analysis of PGE’s technical method for determining the MDL. PGE provided a screenshot of its power loading software³ that showed MDL loading information for the Waconda substation transformer

² Attachment A at 5 (System Impact Study, SPQ0158, (Oct. 25, 2019)).

³ Attachment B (Waconda BR1 Substation Transformer Daytime Minimum Load 5/5/2019).

from May 5, 2019, the date of the “correct” MDL number. While the screenshot showed a data point of 2.48 MW occurring at 1:27 PM, it also showed that the minimum load on May 5, 2019 was 2.01 MW. This was concerning to Carnes Creek because it showed a lower value than PGE’s stated “correct” value of 2.4 MW, and more importantly less than the nameplate capacity of the higher queued project, SPQ0028.⁴ Despite Carnes Creek’s concerns, PGE has not yet provided assurances acceptable to Carnes Creek that its interconnection cost estimates are appropriate and has stated it would withdraw the Project from the interconnection queue unless Carnes Creek agrees to adopt the new cost estimates by amendment to the current interconnection agreement.⁵

Regardless of the appropriate MDL and the apparent differences of opinion regarding the application of MDL data to determine interconnection upgrades, Carnes Creek believes it can remedy the issue by reducing its nameplate capacity by up to 199 kilowatts to be below PGE’s cited MDL value of 2.4 MW. This solution will allow Carnes Creek to operate below PGE’s stated MDL of 2.4 MW so that no backfeeding would occur and avoid any disputes related to the MDL or other related technical issues. Carnes Creek recently proposed to PGE the solution of keeping the nameplate capacity the same but derating the dispatch power capability of the Project via inverter settings

⁴ These concerns are documented in the email correspondence between Carnes Creek and PGE included as Attachment C, and an endorsed letter from a licensed professional engineer retained by Carnes Creek as Attachment D. Note the endorsed engineering letter contains a minor reference typo in relation to the higher queued project, SPQ0028, referring to it as SPQ0022. The intended reference is to SPQ0028 and the typo does not change the substance or conclusions of the letter.

⁵ Attachment E (Letter from PGE to Carnes Creek dated Apr. 8, 2020).

and relay schemes so that output would not exceed the MDL; however, PGE recently rejected Carnes Creek's proposed solution. Therefore, Carnes Creek now seeks a waiver to formally change its designed nameplate capacity to be below the MDL.

Carnes Creek will face significant barriers and is not likely to ultimately be developed if it is required to re-start the interconnection process as required under OAR 860-082-0025(1)(b) & (c). This is because Carnes Creek's land use permit must be initiated and exercised by September 4, 2020 in order to remain valid.⁶ First, the interconnection study process will likely take longer than just a few months, and is not likely to be completed by September 4, 2020. Second, since Carnes Creek's permit was granted, the land use requirements have changed, and Carnes Creek's land use cannot qualify under the new requirements.⁷ Shortly prior to this filing PGE notified Carnes Creek that it had withdrawn the Project from the queue, even despite the current interconnection agreement still in place.

⁶⁶ Attachment F (Email from Marion County dated Apr. 16, 2020).

⁷ On May 23, 2019 the Oregon Department of Land Conservation and Development adopted permanent rule changes to the State's land use siting rules that pertain to commercial solar facilities under OAR 660-033-0130. The new rules limit the available land for siting and permitting any new solar facilities on and prohibit development of commercial solar facilities on, by some accounts, 86% of the land in Willamette Valley. See Ken Pearson, Oregon's DLCD Finalizes Solar Siting Rules (July 5, 2019) *available at* <https://www.jdsupra.com/legalnews/oregon-s-dlcd-finalizes-solar-siting-78067/>. Additionally, Carnes Creek is sited in Marion County which the Board of Commissioners completely repealed the County's zoning codes for solar to be sited on farmland at its March 21, 2018 public meeting. Attachment G (Marion County BOC Ordinance 1387). If Carnes Creek's land use permit is not exercised by September 4, 2020, the permit will expire and the project will not be able to move forward.

III. GOVERNING AUTHORITY

OAR 860-082-0010 provides that the Commission may waive any part of the Small Generator Interconnection Rules if the petitioner can establish sufficient reason that the waiver is in the public interest and can be granted with “good cause.” Specifically, the rule 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.” Further, in granting a waiver the Commission looks to whether the facts presented represent unusual circumstances or circumstances that were not anticipated at the rule’s creation.⁸

IV. REQUEST FOR WAIVER

Good cause exists to grant Carnes Creek’s request for waiver of OAR 860-082-0025(1)(b) & (c) due to the fact that the CSP rules allow project nameplate capacity reductions up to 199 kilowatts and considers such revisions “minor revisions.” The success of the CSP is in the public interest. Specifically, the Commission expects that the CSP “will offer meaningful choices to customers, and will result in new project development.”⁹

If Carnes Creek were able to reduce its nameplate capacity by up to 199 kilowatts as is allowed by the CSP rules, it would enable the Project to interconnect at a capacity below the PGE’s MDL value of 2.4 MW and therefore avoid paying for costly upgrades

⁸ *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).

⁹ *In re Pub. Util. Comm’n of Or. Cmty. Solar Implementation*, Docket No. UM 1930, Order No. 20-076 at 2 (Mar. 12, 2020).

while still being able to safely and timely interconnect to participate and serve customers enrolled in Oregon's CSP. Without being granted a waiver, Carnes Creek would have to terminate the current interconnection agreement and resubmit its interconnection application at a lower nameplate capacity. However, Carnes Creek's land use permit must be initiated and exercised by September 4, 2020 in order to remain valid,¹⁰ so Carnes Creek now faces near term development timeline issues that make resubmittal of its interconnection application impractical and fraught with significant timing risk and unnecessary permitting risk. A reduction in the Project's nameplate capacity is the only practical and viable option, however this can only be done if waiver of OAR 860-082-0025(1)(b) & (c) is granted so that Carnes Creek and PGE can simply amend the current interconnection agreement for the revised capacity and revise the cost estimates accordingly for the distribution upgrades cited in the new SIS. Additionally, granting the waiver will not harm PGE or its customers because Carnes Creek will be able to interconnect at a nameplate capacity below the level that PGE's interconnection standard requires upgrades for mitigating adverse system impacts related to backfeeding.

Further, the Commission likely did not anticipate the unique circumstances presented by these facts when OAR 860-082-0025(1)(b) & (c) were adopted. The Small Generator Interconnection Rules were adopted in 2009. The CSP program was not enacted until seven years later in 2016, and it was not until the Commission's implementation process that the Commission allowed CSP projects to reduce their

¹⁰ Attachment F.

nameplate capacity by up to 199 kW and considers such changes minor revisions.¹¹

Further, the facts of this case are unique to this initial phase of the CSP where community solar projects started out by processing their interconnections through the Small Generator Interconnection Rules before the Commission had established a CSP-specific interconnection process, and at the same time as major changes in the region's land-use requirements.

As a conditionally pre-certified CSP project, Carnes Creek is proposing what the CSP rules reasonably consider a "minor revision," yet what the Small Generator Interconnection Rules consider a change requiring submittal of a new application. As is shown by Carnes Creek's experience in the interconnection queue, the interconnection process can sometimes be unduly fluid and affords interconnection customers limited ability to identify solutions for unforeseen design issues. A project being able to have a small amount of "wiggle room" to reduce its final nameplate capacity gives projects reasonable leeway to surmount what can be significant obstacles for development. If Carnes Creek is not able to reduce its capacity to be below the MDL, then it will not be able to provide meaningful choices to customers in the CSP. If the Commission grants Carnes Creek's request of this waiver, Carnes Creek requests that it direct PGE to reinstate the Project into the queue.

¹¹ CSP Program Implementation Manual at 67 (approved *In re Pub. Util. Comm'n of Or. Cmty. Solar Implementation*, Docket No. UM 1930, Order No. 19-438 (Dec. 19, 2019).

V. CONCLUSION

For the reasons articulated herein, the Commission should grant Carnes Creek a waiver of OAR 860-082-0025(1)(b) & (c).

Dated this 23rd day of April 2020.

Respectfully submitted,

Sanger Law, PC



Irion A. Sanger
Marie P. Barlow
Sanger Law, PC
1041 SE 58th Place
Portland, OR 97215
Telephone: 503-756-7533
Fax: 503-334-2235
irion@sanger-law.com

Of Attorneys for Carnes Creek Solar, LLC

Attachment A

System Impact Study

SPQ0158

Oct. 25, 2019

Portland General Electric



System Impact Study

Interconnection Request:

Carnes Creek Solar, LLC – 2.50 MWAC

SPQ0158

10/25/2019



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1. Introduction

On January 29, 2018, Portland General Electric (PGE) received a completed Small Generator Interconnection Request for SPQ0158. The Interconnection Request seeks to interconnect a 2.50 MWAC solar facility located in Marion county, Oregon at GPS coordinates 45.075646, -122.927126. The interconnection point will be on PGE's Waconda-13 distribution feeder connected to the Waconda substation.

As set forth in the Oregon Administrative Rules 860-082-015(29), PGE has assigned queue number SPQ0158 to the Interconnection Request.

On June 25, 2018, 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 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: September 9, 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.
- SPQ0158 was modeled at its maximum capability of 2.50 MWAC.
- The Point of Interconnection will be on PGE's Waconda-13 distribution feeder at GPS coordinates 45.075646, -122.927126.
- 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, 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 twenty (20) CPS, SCH125TL-DO/US-600 inverters with reactive power capabilities as shown in the provided Small Generator Interconnection Request.
- This report is based on information available at the time of the study September 9, 2019.

4. System Impact Study Interconnection Requirements

A System Impact Study was performed for SPQ0158. 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

To properly service the generation facility, the installation of a new primary service and metering package will be needed. No other distribution modifications were identified as part of the study.

The Generation Facility will be required to use dynamic VAR support as the maximum primary voltage fluctuation was measured to be 2.4% during light loading conditions and 4.1% during heavy loading conditions. Dynamic VAR Support has been recommended to mitigate voltage flicker issues.

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

Protection Requirements

The daytime minimum load on the Waconda-13 feeder is 1.1 MW which occurred on 5/4/2019. Additionally, the daytime minimum load on the Waconda substation transformer is 2.4 which occurred on 5/5/2019. The Waconda substation transformer is rated at 25 MVA.

With the installation of SPQ0158, the total aggregate generation of 7.14 MW will exceed the daytime minimum load on both the feeder and the Waconda BR1 substation transformer.

Under the conditions outlined above the generation can carry the entire BR1 transformer load and will backflow into the transmission system. This has the potential for the following scenario 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 considerable 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 dual SEL-487E substation transformer relay panels
- Install a set of voltage transformers (VT's) on the 57 kV system
- Transfer trip to the DER via Mirror Bits

Transfer trip requires running a fiber optic line from the Waconda Substation to the point of interconnection which is approximately 2.36 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)	\$30,000.00
Protection Requirements	\$484,900.00



(Equipment Inside the Substation)
 Communications Requirements
 (Fiber)

\$254,000.00
Total \$768,900.00

6. Schedule

PGE estimates it will require approximately 20 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 SPQ0158 is not dependent on higher queued projects completing their interconnection requirements.

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, 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 Waconda-13 feeder.

Queue Position	AC Nameplate Rating	Status	In-Service Date
SPQ0003	2.2 MW	In-Service	12/22/2017
SPQ0028	2.2 MW	In-Service	10/4/2019

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

SYSTEM IMPACT STUDY FOR SPQ0158

Carnes Creek Solar Revision 1B

Prepared by

Cameron Van Leuven (POWER Engineers, Inc.)

Reviewed by

Brad Hennessey (POWER Engineers, Inc.)



EXPIRES: 6-30-21

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SYSTEM IMPACT STUDY (SIS) FOR DISTRIBUTION LINES AND EQUIPMENT

INTERCONNECTION INFORMATION

Customer Information

Queue Position	SPQ0158
Applicant Name	Carnes Creek Solar
System Impact Study Commitment Date	8/31/19
Size of Proposed Facility (MW)	2.50 MW AC
Coordinates or Facility Location	45.075646, -122.927126
Inverter Type(s)	CPS SCH125KTL-DO/US-600
Engineer Performing SIS	Cameron Van Leuven (POWER Engineers, Inc)
Accounting Work Order (AWO)	1000008207

Interconnection Summary

System Impact Study was performed Carnes Creek Solar on the Waconda Substation, feeder Waconda – Waconda 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:

- Add Dynamic VAR support for flicker
- Install one (1) set of 300-amp Solid-Blade cutouts and service metering at DER lateral

The maximum primary voltage fluctuation was measured to be ~2.1% during light loading conditions and ~4.2% during heavy loading conditions. Dynamic VAR Support has been recommended to mitigate voltage flicker issues.

This generator interconnection is expected to backfeed onto the transmission system during periods of light load. The low level of backfeed is not expected to cause or worsen any thermal, voltage, or stability concerns for the transmission system.

Distribution Line Related Upgrades (PGE Responsibility)

Description	Estimated Cost
New Primary Service and Metering Package	\$30,000

Total Estimated Distribution Line Cost	\$30,000
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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
SPQ0003	-	Waconda-Waconda 13	BR1	45.130436, -122.897501	2.200	Completed
SPQ0028	-	Waconda-Waconda 13	BR1	45.083472, -122.904527	2.200	Under Construction
SPQ0048	-	Waconda-Waconda 13	BR1	45.062974, -122.939467	2.500	Withdrawn
SPQ0142	-	Waconda-River	BR1	45.096001, -122.949462	3.000	Withdrawn
SPQ0158	Carnes Creek Solar, LLC	Waconda-Waconda 13	BR1	45.075646, -122.927126	2.500	System Impact Study
SPQ0172	-	Waconda-Waconda 13	BR1	45.072629, -122.913603	2.250	System Impact Study

SYSTEM IMPACT STUDY (SIS) FOR DISTRIBUTION LINES AND EQUIPMENT

BASE CASE INFORMATION FOR LIGHT LOADING CONDITIONS

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

Light Loading Information

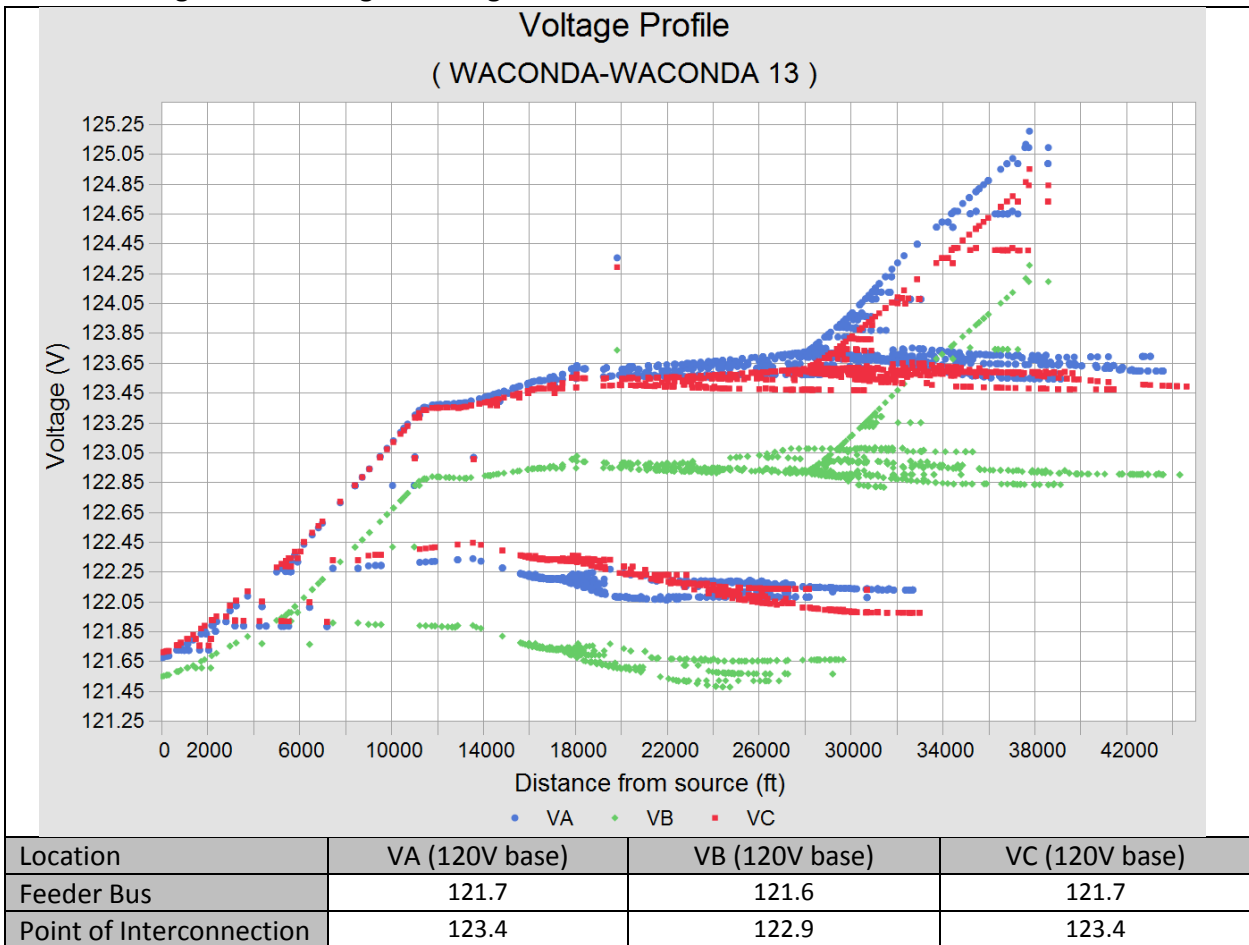
Simulated Date	4/28/2019
Simulated Hour	13:00

Feeder Loading Information

Feeder Name	Transformer Position	Loading (KW)	Loading (KVAR)
Waconda - Customer Feeder	BR2	Redacted	Redacted
Waconda - River	BR1	880	-900
Waconda - Waconda 13 (50% consumption load)	BR1	-1193.4	-446

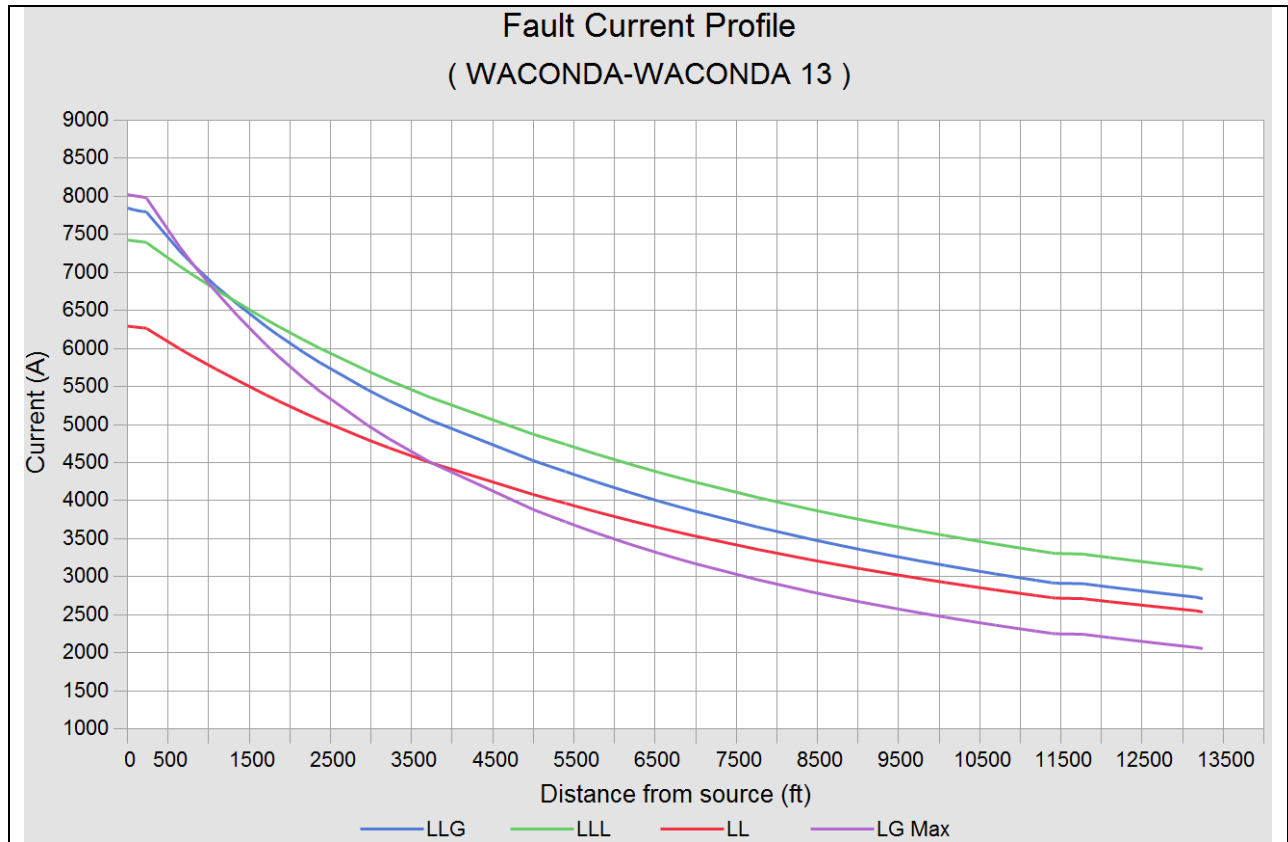
Note: 50% Consumption load is used for the load allocation and analysis below. It is determined from measured minimum load by separating consumption load from solar photovoltaic generation, reducing consumption load by half, and then adding back the solar photovoltaic generation. It is effectively the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

Feeder Voltage Profile for Light Loading Conditions



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_WACONDA R108, BREAKER_A_UNKKV	0	Y	1200	>10000	8023
SW_3153, SW_1200A_UNKKV	228	Y	1200	20000	7985
RCL_3309, RCL_800A	5396	Y	800	12500	4740
SW_8422, SW_600A_UNKKV	11424	Y	600	20000	3307
SW_8423, SW_600A_UNKKV	11763	Y	600	20000	3298

Pertinent Violations

Device Type	General Location	Violation Type	Comments
No violations.			

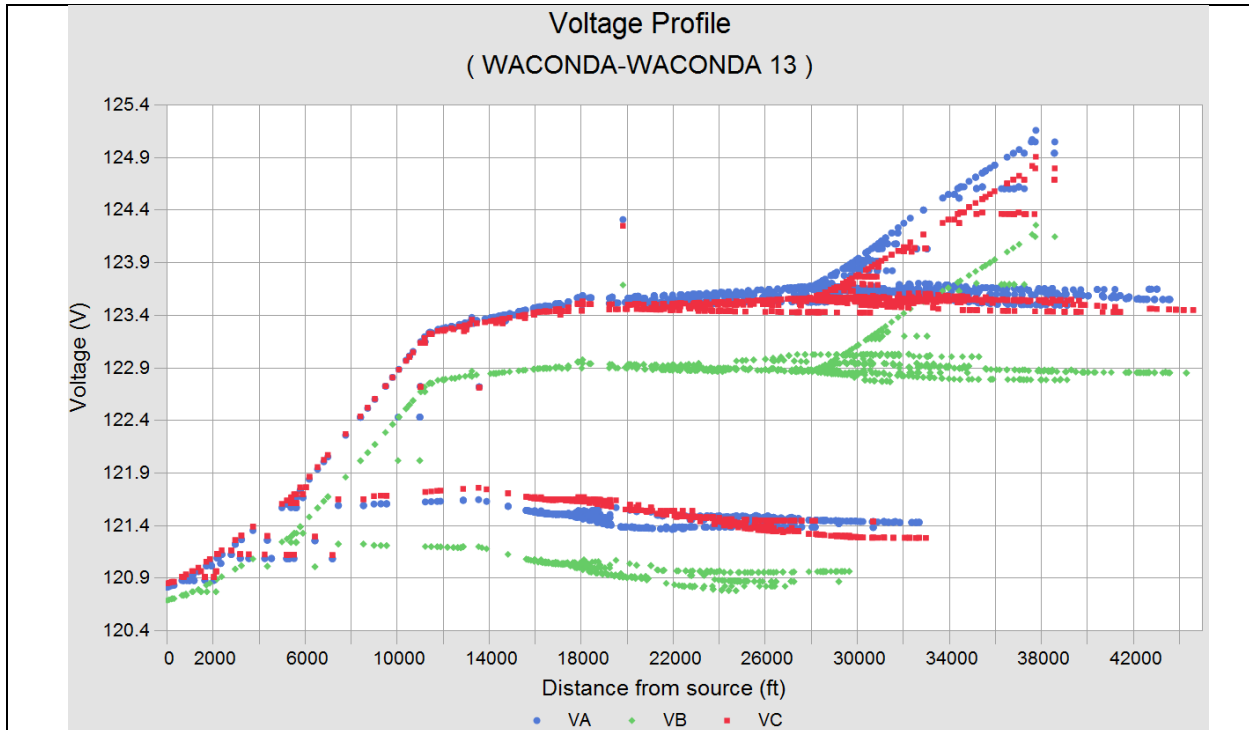
SYSTEM IMPACT STUDY (SIS) FOR DISTRIBUTION LINES AND EQUIPMENT

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

DG Location

DG Location	
Latitude (DD)	Longitude (DD)
45.075646	-122.927126

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	123.3	123.2	0.1	123.2	123.0	0.2	123.4	123.2	0.2
POI	126.0	123.4	2.1	125.5	122.9	2.1	126.0	123.4	2.1

System Backfeed

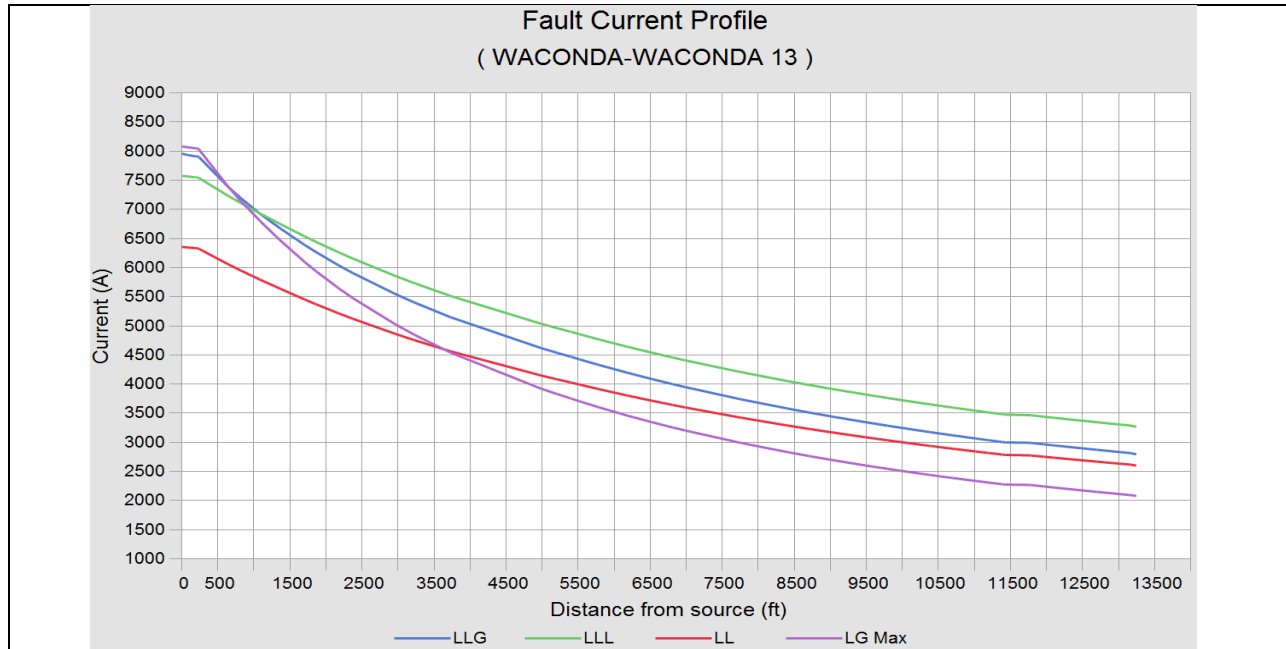
Location	KW	KVAR
Feeder Breaker	-5751	-20
Transformer (57kV terminals)	-4850	-735
Substation Source Location	-4394	-1288

SYSTEM IMPACT STUDY (SIS) FOR DISTRIBUTION LINES AND EQUIPMENT

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

This generator interconnection is expected to backfeed onto the transmission system during periods of light load. The low level of backfeed is not expected to cause or worsen any thermal, voltage, or stability concerns for 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_WACONDA R108, BREAKER_A_UNKKV	0	Y	1200	>10000	8080
SW_3153, SW_1200A_UNKKV	228	Y	1200	20000	8042
RCL_3309, RCL_800A	5396	Y	800	12500	4899
SW_8422, SW_600A_UNKKV	11424	Y	600	20000	3476
SW_8423, SW_600A_UNKKV	11763	Y	600	20000	3468

Pertinent Violations

Device Type	General Location	Violation Type	Comments
No violations.			

SYSTEM IMPACT STUDY (SIS) FOR DISTRIBUTION LINES AND EQUIPMENT

BASE CASE INFORMATION FOR HEAVY LOADING CONDITIONS

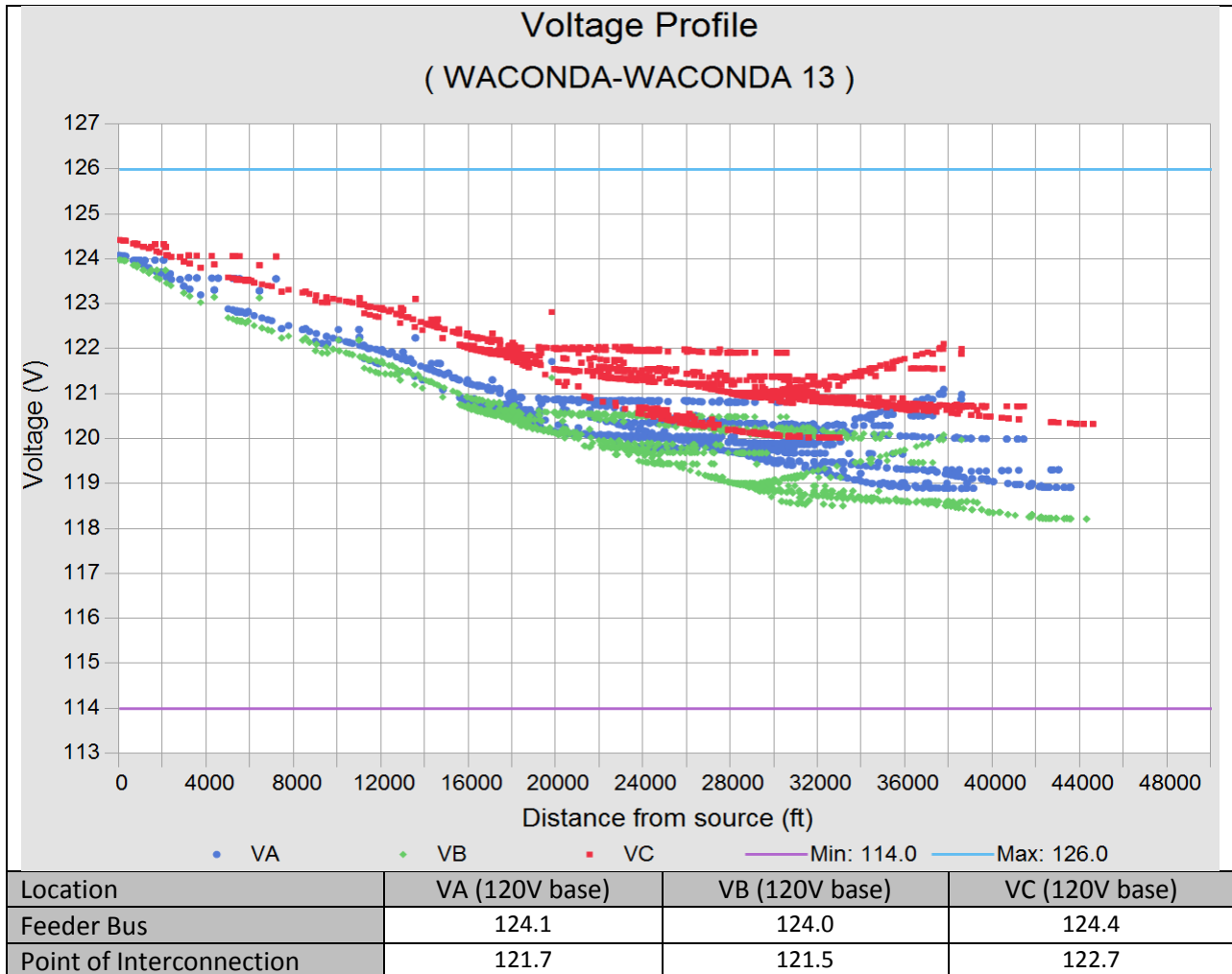
Heavy Loading Information

Simulated Date	8/14/2018
Simulated Hour	16:00

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

Feeder Name	Transformer Position	Loading (KW)	Loading (KVAR)
Waconda-Customer Feeder	BR2	Redacted	Redacted
Waconda-River	BR1	4301	1538
Waconda-Waconda 13	BR1	6689	1742

Feeder Voltage Profile for Heavy Loading Conditions



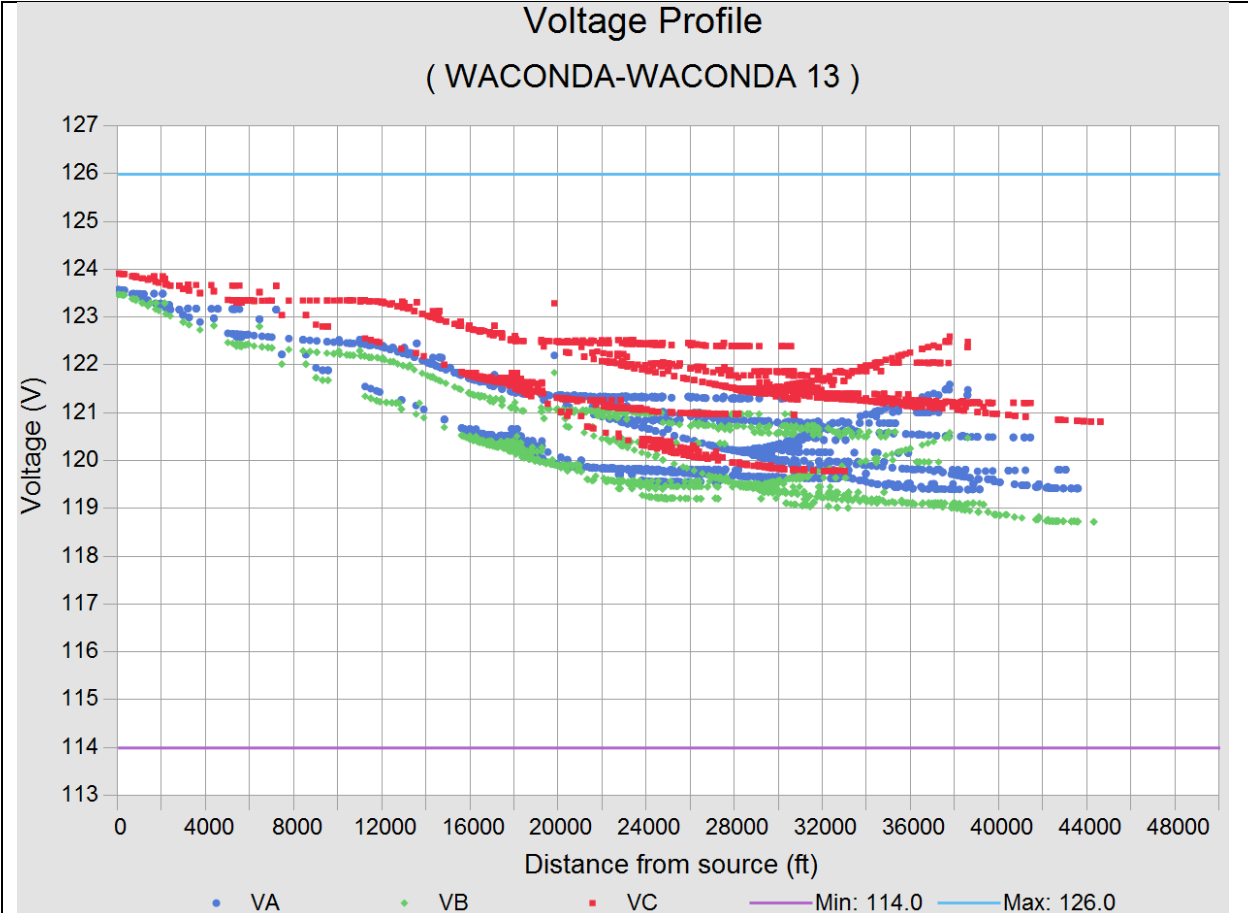
Pertinent Violations

Device Type	General Location	Violation Type	Comments
No violations.			

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	127.2	125.5	1.4	127.1	125.4	1.4	127.6	125.9	1.4
POI	126.2	121.1	4.2	125.9	120.8	4.2	127.1	122.1	4.1

System Backfeed

Location	KW	KVAR
Feeder Breaker	1943	1520
Transformer (115 or 57kV terminals)	6275	-2356
Substation Source Location	14134	1009

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

SYSTEM IMPROVEMENTS – LIGHT LOADING

System Improvement Summary

The improvements needed pertaining to this interconnection:

- Add Dynamic VAR support for flicker
- Install one (1) 300-amp Solid-Blade cutouts and service metering at DER lateral

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

No voltage profile impacts due to system improvements required.

Location	VA (120V base)	VB (120V base)	VC (120V base)
Feeder Bus			
Point of Interconnection			

SYSTEM IMPACT STUDY (SIS) FOR DISTRIBUTION LINES AND EQUIPMENT

Fault Current Profile

No fault current profile impacts due to system improvements required.

Device Type or ID	Distance From Substation (ft)	Bidirectional? (Y/N)	Continuous Rating (Amps)	Momentary Symmetrical, Asymmetrical Interrupting Rating (Amps)	Max Fault Current (Amps)

Note: List devices between proposed point of interconnection and the feeder breaker. Include feeder regulator(s), feeder breaker, fuses, reclosers, switches, sectionalizers, and line regulators

Pertinent Violations

Device Type	General Location	Violation Type	Comments

Note: None of these violations should supersede base case 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)

No voltage profile impacts due to system improvements required.

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									
POI									

Note: POI = Point of Interconnection.

System Backfeed

Location	KW	KVAR
Feeder Breaker		
Transformer (115 or 57kV terminals)		
Substation Source Location		

SYSTEM IMPACT STUDY (SIS) FOR DISTRIBUTION LINES AND EQUIPMENT

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

No fault current profile impacts due to system improvements required.

Device Type or ID	Distance From Substation (ft)	Bidirectional? (Y/N)	Continuous Rating (Amps)	Momentary Symmetrical, Asymmetrical Interrupting Rating (Amps)	Max Fault Current (Amps)

Pertinent Violations

Device Type	General Location	Violation Type	Comments

Note: None of these violations should supersede base case violations.

SYSTEM IMPACT STUDY (SIS) FOR DISTRIBUTION LINES AND EQUIPMENT

SYSTEM IMPROVEMENTS – HEAVY LOADING

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

No voltage profile impacts due to system improvements required.

Location	VA (120V base)	VB (120V base)	VC (120V base)
Feeder Bus			
Point of Interconnection			

Pertinent Violations

Device Type	General Location	Violation Type	Comments

Note: None of these violations should supersede base case 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)

No voltage profile impacts due to system improvements required.

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									
POI									

Note: POI = Point of Interconnection.

System Backfeed

Location	KW	KVAR
Feeder Breaker		
Transformer (115 or 57kV terminals)		
Substation Source Location		

SYSTEM IMPACT STUDY (SIS) FOR DISTRIBUTION LINES AND EQUIPMENT

Pertinent Violations

Device Type	General Location	Violation Type	Comments

Note: None of these violations should supersede base case 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				70
03401			100			
03405			140			
03406			50		3000	
39135			70			4200
03402			1A3C	100	V4L	6000
39130		2A2D				
03403		1A3C				
39131		2A2D				
03408		1A3C				
39132		2A2D				
03410		1A3C				
39133		2A2D				
03411		1A3C	280			
39134		2A2D				
—		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

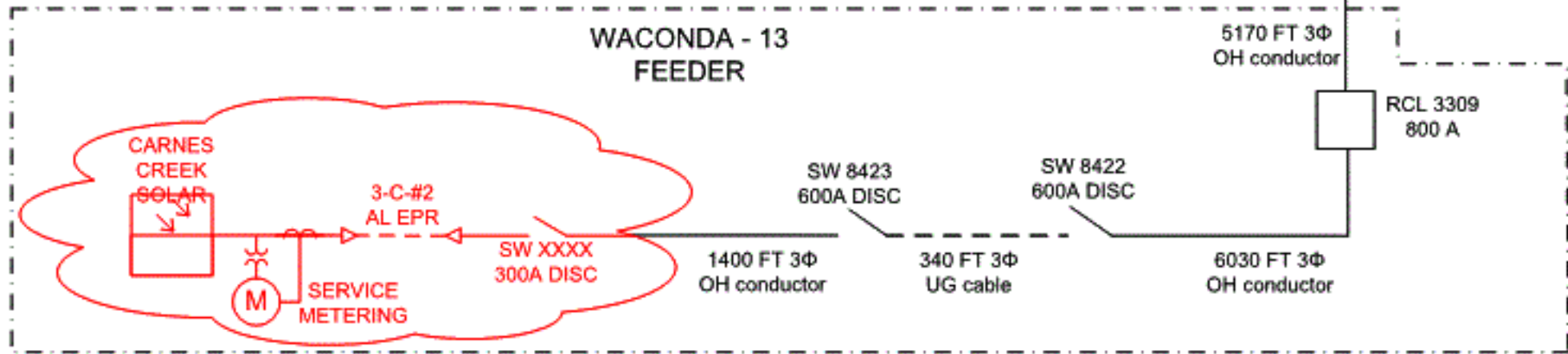
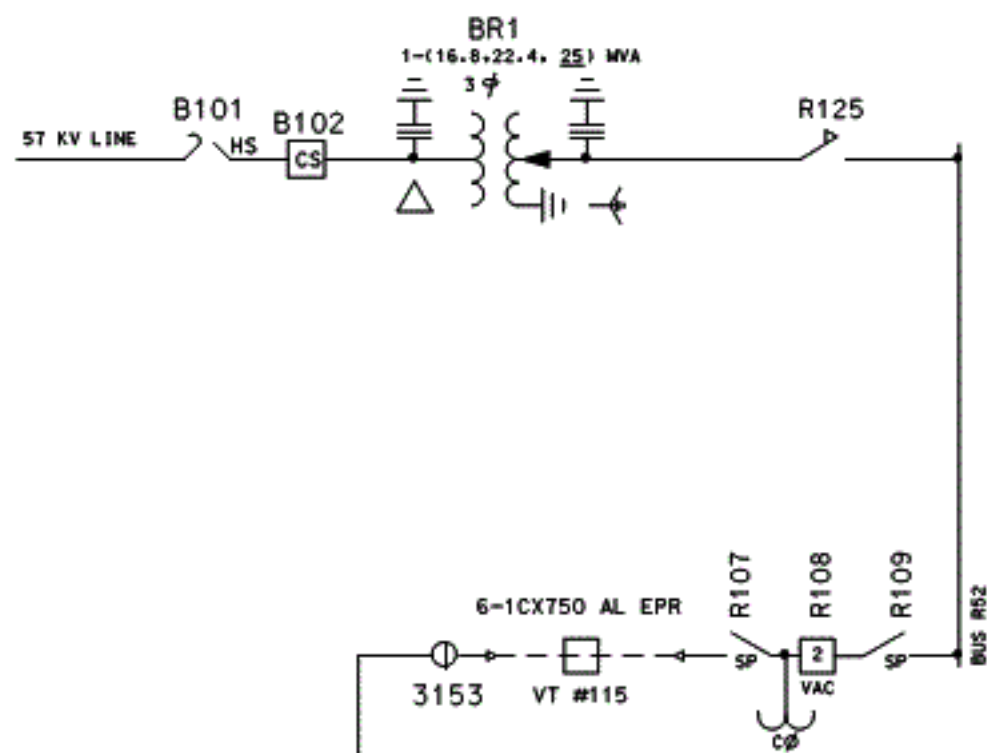
IEEE Voltage Range/Clearing Times Table

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.



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REV	REVISIONS	DATE	DRN	DSGN	CXD	APPD	REFERENCE DRAWINGS
0A	ISSUED FOR REVIEW	2019/08/19	ZDS	ZDS	CAV	JRM	

DSGN	ZDS	2019/08/19
DRN	ZDS	2019/08/19
CXD	CAV	2019/08/19
SCALE:	NTS	



PORTLAND GENERAL ELECTRIC
SYSTEM IMPACT STUDY
SPQ015B
CARNES CREEK SOLAR ONELINE
WACONDA-13 FEEDER

JOB NUMBER	159814	REV	0A
DRAWING NUMBER	CARNES CREEK 1		

Attachment B

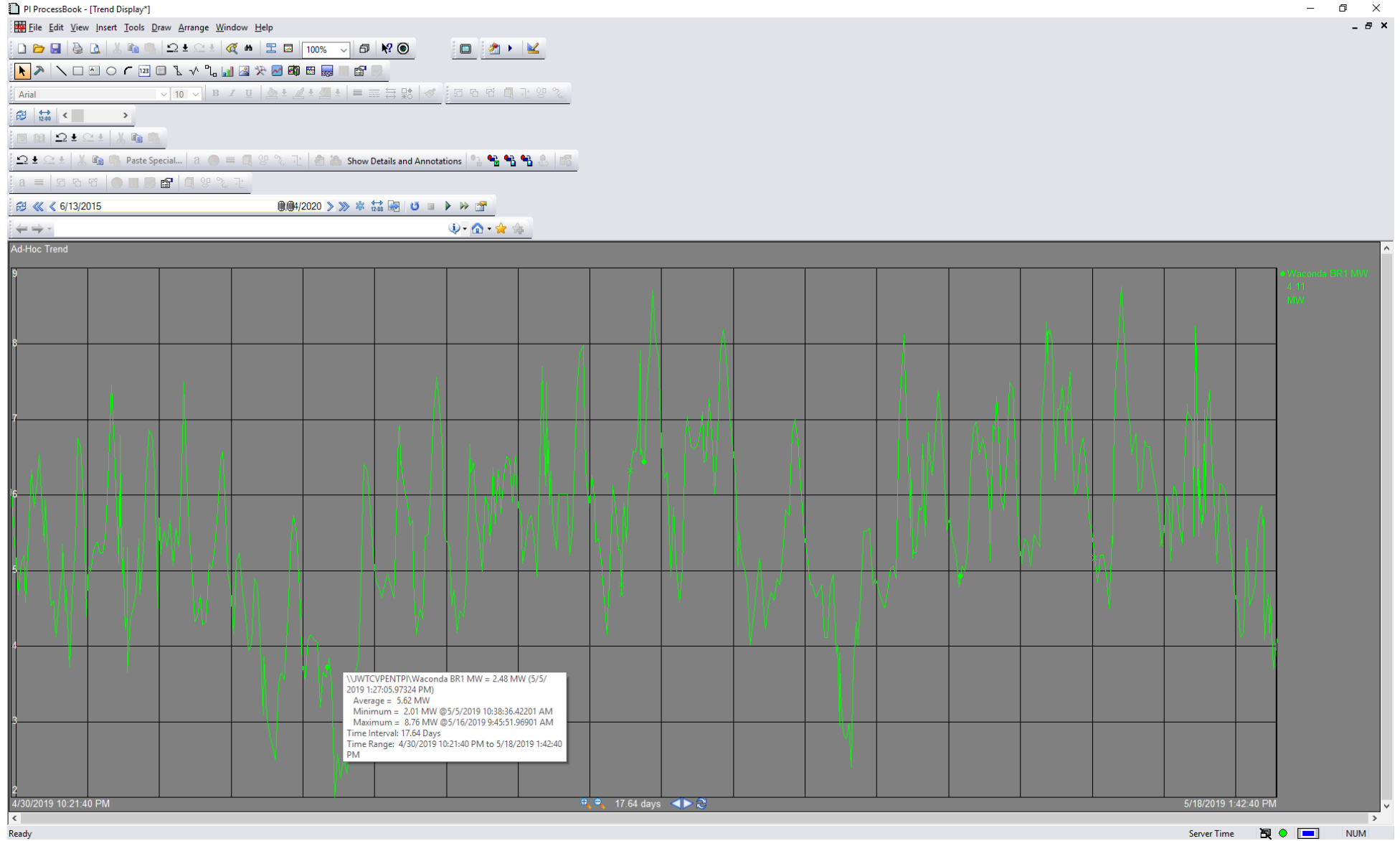
Waconda BR1 Substation Transformer

Daytime Minimum Load

5/5/2019 & 10/19/2019

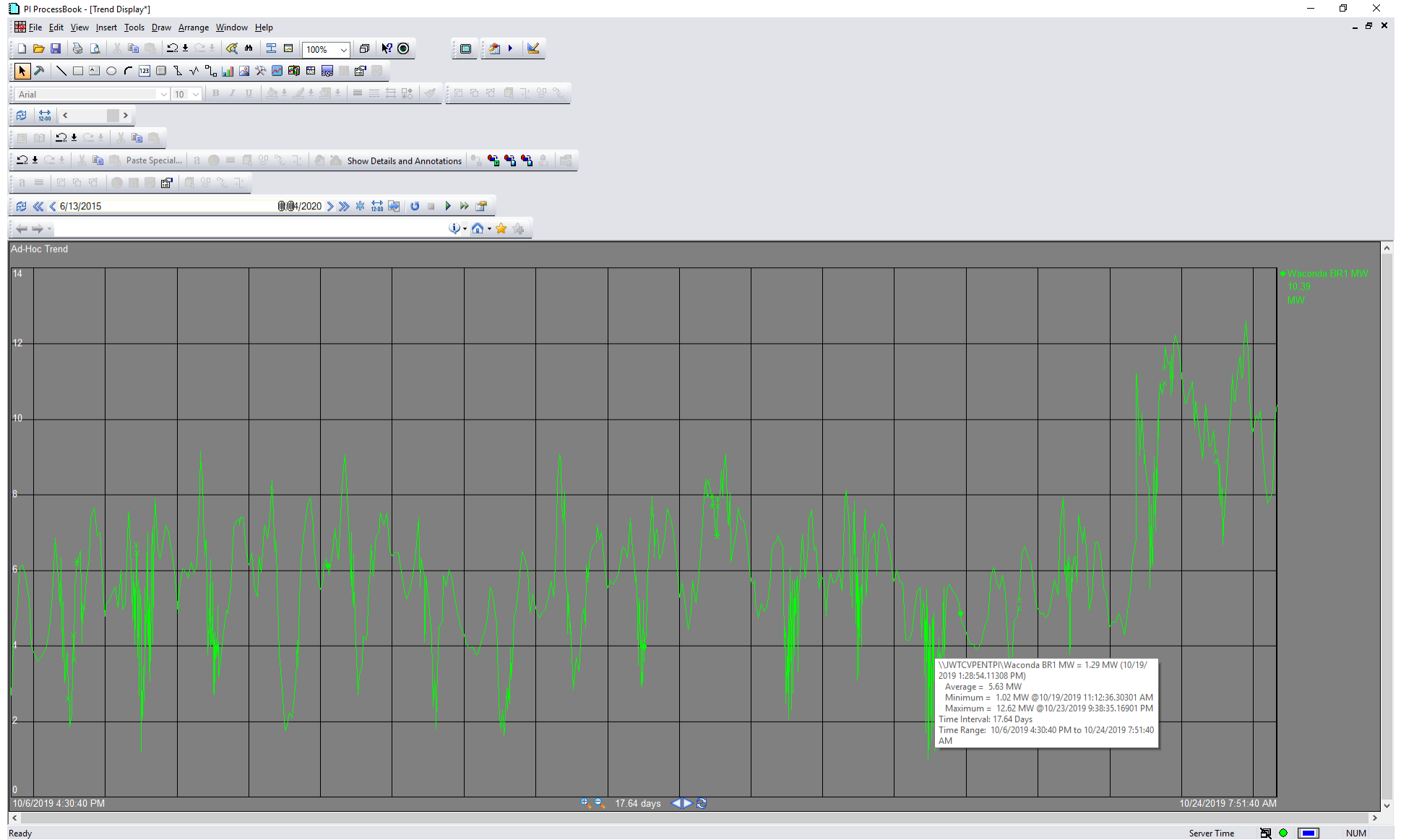
Waconda BR1 Substation Transformer

Daytime Minimum Load 5/5/2019 2.48 MW



Waconda BR1 Substation Transformer

Daytime Minimum Load 10/19/2019 1.29 MW



Attachment C

**Email Correspondence between PGE and Carnes Creek
Oct. 25, 2019 to Apr. 23, 2020**



Jonathan Nelson <jonathan@coniferenergypartners.com>

Your System Impact Study Report for SPQ0158 is complete**Small Power Production** <Small.PowerProduction@pgn.com>

Thu, Apr 23, 2020 at 11:06 AM

To: Jonathan Nelson <jonathan@coniferenergypartners.com>

Cc: Jonathan Denman <jd@nimbuspowerengineers.com>, Small Power Production <Small.PowerProduction@pgn.com>

Jonathan,

PGE has reviewed your e-mail dated April 16, 2020. PGE cannot accept your request to downsize the nameplate capacity of the Carnes Creek project by 199kW. The change in nameplate would require a new application as outline in OAR 860-082-0025(1)(c). PGE is not agreeable to requesting a waiver from the Commission on this matter.

As a result of changes to the project queue, the requirements to interconnect the above-referenced project have changed and the costs associated with that interconnection have increased. These changes are reflected in a System Impact Study dated October 25, 2019 and a Facilities Study dated February 14, 2020. PGE has provided Carnes Creek with a detailed estimate of the time required to procure, construct and install the required interconnection facilities and system upgrades. PGE has sought Carnes Creek Solar LLC's agreement to pay for the required interconnection facilities and system upgrades identified in the Facilities Study. Per OAR 860-082-0035(5), PGE cannot begin work on the system upgrades without written agreement that Carnes Creek accepts the good faith, non-binding cost estimate provided by PGE. Because Carnes Creek has not accepted this estimate, the project is deemed withdrawn and is being removed from the project queue. PGE will issue you a check within the next thirty (30) days refunding the initial payment issued by Carnes Creek. I have placed a letter in the mail indicating the same.

If you have any questions, please contact me at Small.PowerProduction@pgn.com or call 503-464-8300.

Regards,

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

From: Small Power Production**Sent:** Friday, April 17, 2020 3:32 PM**To:** 'Jonathan Nelson' <jonathan@coniferenergypartners.com>**Cc:** Jonathan Denman <jd@nimbuspowerengineers.com>; Small Power Production <Small.PowerProduction@pgn.com>**Subject:** RE: Your System Impact Study Report for SPQ0158 is complete

Jonathan,

PGE is in receipt of your e-mail dated April 16, 2020 regarding Carnes Creek. PGE rejects the amendment proposed by Carnes Creek that is attached to that e-mail. PGE is reviewing the questions you posed in your April 16, 2020 e-mail, and will get back to you early next week with a response.

Regards,

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

From: Jonathan Nelson <jonathan@coniferenergypartners.com>**Sent:** Thursday, April 16, 2020 5:12 PM**To:** Small Power Production <Small.PowerProduction@pgn.com>**Cc:** Jonathan Denman <jd@nimbuspowerengineers.com>**Subject:** Re: Your System Impact Study Report for SPQ0158 is complete*****Please take care when opening links, attachments or responding to this email as it originated outside of PGE.*****

Jason,

Thank you for your reply. Attached is an amendment for the standing interconnection agreement that includes provisions requiring the facility to have its power output capability derated to less than 2.48 megawatts while still maintaining the as-built nameplate capacity of 2.5 megawatts. The number of inverters and nameplate capacity of Carnes Creek Solar would remain the same as what was originally submitted in the interconnection application, but peak power output would be set below the MDL.

This approach of keeping the as-built nameplate capacity as 2.5 MW but derating the power capability to less than the MDL would mitigate the 3V0 protection requirements and allow Carnes Creek Solar and PGE to proceed with the attached amendment without requiring a waiver for nameplate capacity change. According to my engineer Jon Denman (cc'd), the derate approach is common utility practice for inverter-based facilities, as well as FERC-licensed generators.

Please let me know by COB tomorrow if this approach is acceptable. Otherwise I will begin preparing a waiver request as noted in my April 14 email.

Thank you,

-- Jonathan Nelson

Conifer Energy Partners LLC

303-709-9600

On Thu, Apr 16, 2020 at 1:41 PM Small Power Production <Small.PowerProduction@pgn.com> wrote:

Jonathan,

PGE is in receipt of your email and is evaluating your request.

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

From: Jonathan Nelson <jonathan@coniferenergypartners.com>

Sent: Tuesday, April 14, 2020 12:01 PM

To: Small Power Production <Small.PowerProduction@pgn.com>

Cc: Janette Sandberg <Janette.Sandberg@pgn.com>; Michael Slevcove <Michael.Slevcove@pgn.com>; brad.hennessey@powereng.com

Subject: Re: Your System Impact Study Report for SPQ0158 is complete

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

Hello,

I am in receipt of PGE's letter from April 8, 2020 stating that Carnes Creek must either agree to PGE's current amendment by April 15, 2020, otherwise PGE will withdraw Carnes Creek from the interconnection queue.

PGE's proposed method for proceeding with the interconnection of Carnes Creek Solar is not contemplated in either the standing interconnection agreement executed by PGE on May 6, 2019, or the Small Generator Interconnection Rules. Therefore PGE does not have the right to proceed as it has suggested in the event I do not execute the amendment you have provided. To review the circumstances at hand:

1. There is a current standing mutually executed interconnection agreement between Carnes Creek and PGE.
2. PGE is proposing to amend the current interconnection agreement to amend the cost estimate and if I do not agree to the amendment by April 15, 2020 then PGE states it will withdraw Carnes Creek from the queue.
3. PGE has yet to provide a facility study with PGE's current cost estimate.
4. Nothing in the interconnection agreement or small gen rules allows PGE to withdraw Carnes Creek from the interconnection queue with an executed interconnection agreement in place.
5. PGE has proposed Carnes Creek to accept costs that are \$738,900 above the endorsed estimate from Brad Hennessey without providing affirmation from an LPE that the additional costs are necessary, reasonable, and do not address pre-existing conditions.
6. PGE has not provided proper notice per the terms in the standing interconnection agreement regarding its intent to withdraw Carnes Creek from the queue if I do not agree to the amendment.

Notwithstanding the above and the issues my engineer and I have previously raised regarding the validity of PGE's methods, I would like to request PGE allow Carnes Creek Solar to downsize its capacity by up to 199 kW so that the project will be below PGE's cited MDL of 2.48 MW thereby mitigating backfeeding and 3V0 requirements.

Carnes Creek Solar has been submitted and recommended for pre-certification in Oregon's Community Solar Program (CSP). The Program Implementation Manual for the CSP approved by Commission Order 19-438 allows downward revisions of the nameplate capacity up to 199 kW and considers such changes minor revisions. Therefore, I would like to request PGE agree to Carnes Creek Solar reducing its nameplate capacity by up to 199 kW as is allowed per the CSP rules so that the project can come to fruition. If PGE is unwilling to accept this approach then Carnes Creek Solar will face irreparable harm as PGE's current interconnection figures are uneconomic and the project's land use permit is set to expire September 5, 2020. If PGE is uncertain about whether the proposed capacity revision is possible under the interconnection rules in OAR 860-082, the revision could be accommodated via requesting the Commission for waiver as noted in OAR 860-082-0010.

I ask that PGE consider this approach in good-faith and provide a response by April 15, 2020.

-- Jonathan Nelson

Conifer Energy Partners LLC

303-709-9600

On Fri, Apr 3, 2020 at 4:19 PM Small Power Production <Small.PowerProduction@pgn.com> wrote:

Jonathan,

PGE is in receipt of your April 2, 2020 e-mail regarding Carnes Creek. The PGE team has reviewed the correspondence provided by you and Mr. Denman. While PGE has explained its findings and processes in other e-mails, below is a brief response to certain items that you and Mr. Denman have raised.

A. Transfer Trip and 3V0 sensing

- *Description:* 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. PGE typically takes the first approach during substation rebuilds; PGE typically takes the second approach when 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.

- *Implementation:* In order to rapidly detect the overvoltage condition, remove the transformer as a source, and trip the DER, the following is required:
 - 3 phase VT on the high side of the substation transformer
 - Circuit Switcher or Breaker on the high side of the substation transformer (Not required for Carnes Creek)
 - SEL-487E relays to detect 3V0 (59N)
 - Transfer trip to the DER via Mirror Bits
- The 3V0 settings are not based on loading and loading does not impact the speed of the relay. Relay settings are based on system requirements.

B. Daytime Minimum Load. As PGE has previously indicated to you, with respect to determining the Daytime Minimum Load, PGE does not look at single instances. PGE looks at loading trends using hourly averages and considers weather and outages/switching on the system to determine the minimum load. This is consistent with prudent utility practices.

C. Work performed by Power Engineers. The analysis that Power Engineers prepares for PGE and that is used by PGE to help prepare a portion of the system impact study does not include the protection impacts on the substation or transmission system – it only relates to the distribution system. PGE's in-house engineers perform the portion of the studies associated with substation and transmission system. Per OAR 860-082-0035(4), PGE has identified the adverse system impacts both to PGE's distribution and transmission system caused by the Carnes Creek application. Carnes Creek is responsible for the cost of all system upgrades to PGE's transmission and distribution system necessitated by the interconnection.

PGE rejects Carnes Creek's Amendment provided with Carnes Creek's April 2, 2020 e-mail reflecting a revised price to the entire system upgrade cost of \$30,000 – it is baseless. Because of a change in the queue, the estimated costs to interconnect Carnes Creek have increased, as reflected in the system impact study and facilities study. The attached amendment to the Interconnection Agreement for the Carnes Creek project reflects the findings from the system impact and facilities studies and is PGE's good faith, non-binding cost estimate for the system upgrades associated with the Carnes Creek interconnection. Per OAR 860-082-0035(5), PGE cannot begin work on the system upgrades without written agreement that Carnes Creek accepts the estimate. Carnes Creek's failure to return a signed Amendment may result in the withdrawal of the project from the queue.

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

From: Jonathan Nelson <jonathan@coniferenergypartners.com>
Sent: Thursday, April 2, 2020 11:29 AM
To: Small Power Production <Small.PowerProduction@pgn.com>
Cc: Janette Sandberg <Janette.Sandberg@pgn.com>; Michael Slevcove <Michael.Slevcove@pgn.com>; brad.hennessey@powereng.com
Subject: Re: Your System Impact Study Report for SPQ0158 is complete

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

Jason,

I do not accept the amendment PGE has provided, or PGE's statements that it has provided good faith estimates of the reasonable costs as required by the rules. PGE's method and statements regarding the MDL and 3V0 requirements as they relate to Carnes Creek lack appropriate technical justification as described in the attached letter from my engineer.

Therefore, as I have already made clear, I require that the interconnection for Carnes Creek Solar proceed under the interconnection agreement executed by PGE on May 6, 2019. I have attached an amendment to properly account for 3V0 issues being pre-existing conditions associated with the addition of SPQ0028, not Carnes Creek Solar. If PGE does not accept then I will seek an opinion from the Oregon State Board of Engineers and Land Surveyors on this specific matter and reserve the right to other potential remedies. I am aware of PGE's position that Oregon's laws and rules for engineering do not apply to PGE's work related to non-utility interconnections, however PGE's position is based on its own presumption which has not been affirmed as valid by OSBEELS. OSBEELS has however affirmed that information furnished by PGE to interconnection customers does constitute the practice of electrical engineering.

I encourage PGE to respond by April 3 stating its agreement to proceed with the attached amendment that properly accounts for the 3V0 issues being pre-existing conditions not due to Carnes Creek, otherwise I will proceed as indicated above.

-- Jonathan Nelson

Conifer Energy Partners LLC

303-709-9600

On Mon, Mar 16, 2020 at 10:19 PM Small Power Production <Small.PowerProduction@pgn.com> wrote:

Jonathan,

Below please see PGE's response to your March 6, 2020 e-mail. Your statements are quoted in bold, italicized text and followed by PGE's response in plain text.

As I requested yesterday, please send me a screenshot showing the loading for the Waconda BR1 substation transformer on 5/28/2019. Also please provide the names of the engineers that provided the daytime minimum load (DML) for both the original and revised system impact reports.

PGE does not believe that either of these requests for information are relevant in order for Carnes Creek to determine whether to move forward with its interconnection.

The DML values PGE used in its System Impact Study and Facilities Study for Carnes Creek show that the two installations of SPQ0003 and SPQ0028 have failed to exceed the DML on the transformer. PGE has concluded that Carnes Creek Solar's generation will exceed the DML resulting in the need for the requirements set forth in the studies.

Additionally, I read back through the email you sent yesterday and there is an important piece of information that PGE has ignored. You state that when PGE studied SPQ0028 in 2017 the DML was high enough to not require 3V0 protection and transfer trip for SPQ0028. However, the time of when PGE studied SPQ0028 was studied is irrelevant.

The DML from 2017 is not relevant to the Carnes Creek study – PGE relies on the DML at the time a given study is performed. In building assumptions regarding an interconnection, PGE looks at load data at the time of a given study because DML is constantly changing particularly from year to year and is heavily impacted by weather and generation. Note that PGE does not continue to monitor the DML after a study has been completed nor does PGE typically change study assumptions after the studies have been completed unless a change in the queue warrants a restudy.

Rather, as is shown by the DML data you provided me on 2/14 for 5/5/2019, just five months prior to the in-service date of SPQ0028 the DML was less than the anticipated output from SPQ0028. The data you provided me shows that the minimum load on 5/5/2019 was 2.01MW at 10:38 AM, not 2.4 MW as you have previously asserted. Therefore, the 3V0 protection PGE is requiring for Carnes Creek Solar was necessary prior to SPQ0028 coming online and PGE should have issued a change order for that project prior to approving its final interconnection. As is shown by the information you have provided me, PGE's system is already exposed to the adverse condition during light loading periods prior to any contribution from Carnes Creek. Or, the condition itself is not a legitimate adverse condition worth protecting against.

With respect to your comment regarding the daytime minimum load on 5/5/2019 at 10:38AM – PGE does not look at daytime minimum load on a minute-by-minute basis; it is looked at on an hourly average.

The 3V0 protection is a transformer protection scheme. Currently, PGE is not experiencing back feed on this feeder, so this is not a problem that currently exists. However, PGE has determined that when Carnes Creek interconnects, a back feed issue will exist.

Additionally, I do not accept PGE's statement that the POWER Engineers report does not address potential impacts associated with 3V0. Also, due to PGE providing me arbitrarily cherry-picked DML data to justify upgrades, I also do not accept the manner in which PGE's engineers prescribe additional requirements beyond what is identified in the system impact study from Power Engineers. The endorsed report from POWER Engineers includes a light loading analysis taking into account the aggregate loading across the Waconda BR1 transformer and concluded that any potential backfeed from the project is "not expected to cause or worsen any thermal, voltage, or stability concerns for the transmission system". Based on information from PGE, a 3V0 condition and associated impacts occur at the transmission level. The endorsed statement from Mr. Hennessey confirms that Carnes Creek Solar does not cause or worsen any potential impacts requiring 3V0 protection.

PGE contracts with POWER to analyze impacts to the distribution system. The scope of work performed by POWER does not include consideration of impacts to PGE's substation or the transmission system. Impacts to PGE's substation are considered by PGE's protection engineer. Impacts to PGE's transmission system and to other utilities' systems are considered by PGE's transmission planning engineer.

The 3V0 is a transformer protection scheme; as such, it is not a requirement that would be identified by POWER.

Based on the endorsed report from Mr. Hennessey and the daytime minimum load of 2.01MW at 10:38:36 AM on 5/5/2019, there are no transmission impacts or need for 3V0 protection due to the addition of Carnes Creek Solar. If any need for 3V0 protection exists at all, it is due to SPQ0028. As the applicant, Carnes Creek Solar is not required to pay for any upgrades associated with any pre-existing conditions. Therefore, I will not accept any responsibility for any upgrades associated with 3V0 protection since the associated alleged impacts are caused by SPQ0028, not by the addition of Carnes Creek Solar.

PGE contracts with POWER to analyze impacts to the distribution system. The scope of work performed by POWER does not include consideration of impacts to PGE's substation or the transmission system. Impacts to PGE's substation are considered by PGE's protection engineer. Impacts to PGE's transmission system and to other utilities' systems are considered by PGE's transmission planning engineer.

The 3V0 is a transformer protection scheme; as such, it is not a requirement that would be identified by POWER.

As a result, I require that the interconnection for Carnes Creek Solar proceed as described in the interconnection agreement executed by PGE on May 6, 2019. I will only accept amendments to Attachment A of the agreement that appropriately account for potential 3V0 issues being pre-existing conditions associated with the addition of SPQ0028, not Carnes Creek Solar.

PGE entered into an Interconnection Agreement with Carnes Creek dated May 6, 2019. That Interconnection Agreement contained a good faith estimate of the costs associated with the interconnection of small generator facilities. Under the Interconnection Agreement, Carnes Creek agreed to be responsible for the cost of the facilities, equipment, modifications and upgrades associated with the interconnection of the small generator facilities as required in OAR 860-082-0035. OAR 860-082-0035 is clear that the Applicant must pay the costs of any system upgrades; the utility is in no way responsible for financing or fronting the cost of the construction of a small generator facility.

The good faith estimates in the Interconnection Agreements are just that – good faith estimates. Construction costs can change or vary for a large variety of reasons, most notably as a result of higher queued projects dropping out.

Attached is an amendment to the Interconnection Agreements Carnes Creek project. This amendment must be signed prior to any further construction work being performed on the Carnes Creek projects. PGE will not continue to work on the interconnection upgrades without written assurance that Carnes Creek will pay for the system upgrades. Per OAR 860-082-0035(5), this Amendment reflect PGE's good faith, non-binding cost estimate and PGE needs the applicant to agree to pay the cost prior to performing work on the system upgrades. The cost estimates reflect construction commencing at the start of April 2020. PGE disclaims any responsibility or liability for delays in the interconnection of this project resulting from Carnes Creek's unwillingness to agree to pay for the cost of the system upgrades.

During the study process for this project PGE has provided me inaccurate information and attempted to cover up errors by cherry-picking data to deliberately mislead and require me to pay for unreasonable and illegitimate upgrades. This is unacceptable and will not be tolerated.

Carnes Creek has no legitimate reason for refusing to move forward with the interconnection process. PGE has provided complete interconnection studies and a reasonable cost estimate. PGE is not preventing Carnes Creek from making informed business decisions. PGE encourages Carnes Creek to proceed with the interconnection process and to execute the enclosed amendment by April 6, 2020.

Regards,

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

From: Jonathan Nelson <jonathan@coniferenergypartners.com>
Sent: Friday, March 6, 2020 12:47 PM
To: Small Power Production <Small.PowerProduction@pgn.com>
Subject: Re: Your System Impact Study Report for SPQ0158 is complete

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

Jason,

As I requested yesterday, please send me a screenshot showing the loading for the Waconda BR1 substation transformer on 5/28/2019. Also please provide the names of the engineers that provided the daytime minimum load (DML) for both the original and revised system impact reports.

Additionally, I read back through the email you sent yesterday and there is an important piece of information that PGE has ignored.

You state that when PGE studied SPQ0028 in 2017 the DML was high enough to not require 3V0 protection and transfer trip for SPQ0028. However, the time of when PGE studied SPQ0028 was studied is irrelevant.

Rather, as is shown by the DML data you provided me on 2/14 for 5/5/2019, just five months prior to the in-service date of SPQ0028 the DML was less than the anticipated output from SPQ0028. The data you provided me shows that the minimum load on 5/5/2019 was 2.01MW at 10:38 AM, not 2.4 MW as you have previously asserted. Therefore, the 3V0 protection PGE is requiring for Carnes Creek Solar was necessary prior to SPQ0028 coming online and PGE should have issued a change order for that project prior to approving its final interconnection. As is shown by the information you have provided me, PGE's system is already exposed to the adverse condition during light loading periods prior to any contribution from Carnes Creek. Or, the condition itself is not a legitimate adverse condition worth protecting against.

Additionally, I do not accept PGE's statement that the POWER Engineers report does not address potential impacts associated with 3V0. Also, due to PGE providing me arbitrarily cherry-picked DML data to justify upgrades, I also do not accept the manner in which PGE's engineers prescribe additional requirements beyond what is identified in the system impact study from Power Engineers. The endorsed report from POWER Engineers includes a light loading analysis taking into account the aggregate loading across the Waconda BR1 transformer and concluded that any potential backfeed from the project is "not expected to cause or worsen any thermal, voltage, or stability concerns for the transmission system". Based on information from PGE, a 3V0 condition and associated impacts occur at the transmission level. The endorsed statement from Mr. Hennessey confirms that Carnes Creek Solar does not cause or worsen any potential impacts requiring 3V0 protection.

Based on the endorsed report from Mr. Hennessey and the daytime minimum load of 2.01MW at 10:38:36 AM on 5/5/2019, there are no transmission impacts or need for 3V0 protection due to the addition of Carnes Creek Solar. If any need for 3V0 protection exists at all, it is due to SPQ0028. As the applicant, Carnes Creek Solar is not required to pay for any upgrades associated with any pre-existing conditions. Therefore, I will not accept any responsibility for any upgrades associated with 3V0 protection since the associated alleged impacts are caused by SPQ0028, not by the addition of Carnes Creek Solar.

As a result, I require that the interconnection for Carnes Creek Solar proceed as described in the interconnection agreement executed by PGE on May 6, 2019. I will only accept amendments to Attachment A of the agreement that appropriately account for potential 3V0 issues being pre-existing conditions associated with the addition of SPQ0028, not Carnes Creek Solar.

During the study process for this project PGE has provided me inaccurate information and attempted to cover up errors by cherry-picking data to deliberately mislead and require me to pay for unreasonable and illegitimate upgrades. This is unacceptable and will not be tolerated.

-- Jonathan Nelson

Conifer Energy Partners LLC

303-709-9600

On Thu, Mar 5, 2020 at 2:07 PM Jonathan Nelson <jonathan@coniferenergypartners.com> wrote:

Jason,

Like the screenshot of the loading information you sent me on 2/14, please send me a screenshot showing the loading for the Waconda BR1 substation transformer on 5/28/2019. Please send this information as soon as possible without delay.

-- Jonathan Nelson

Conifer Energy Partners LLC

303-709-9600

On Thu, Mar 5, 2020 at 11:46 AM Small Power Production <Small.PowerProduction@pgn.com> wrote:

Jonathan,

Below please see PGE's response to your February 14, 2020 e-mail. Your statements are quoted in bold, italicized text and followed by PGE's response in plain text.

The variation of your daytime minimum load numbers in the screenshot you provide and the figures in past interconnection study reports show that the metric does not provide a standardized or objective method to determine which project in the interconnection queue should be responsible for triggering upgrades to mitigate backfeeding. If at any point the substation demand loading is again characteristic of the loading at the time of 1.79 MW on 5/13/2018 referenced in the study for SPQ0048, then by PGE's logic there could be a backfeeding contingency however PGE would not have the necessary equipment to mitigate such faults because it was not installed as part of SPQ0028 interconnection. Or does PGE already have the necessary equipment to mitigate against such faults?

As previously mentioned, the daytime minimum load is constantly changing particularly from year to year and is heavily impacted by weather and generation. We look at the past 12 months of daytime minimum load information to determine if a project requires certain upgrades. The project that triggers the requirement is the one that is responsible for the cost of any upgrade.

At the time PGE studied SPQ0028 (which included the generation of SPQ0003), the loading was such that only a hot-line blocking protection scheme (line side 13kV voltage transformer) was necessary for the SPQ0028 interconnection. Hot-line blocking is required when the generation exceeds 90% of the daytime minimum load. SPQ0028 does not have transfer trip as that is only required when the project exceeds the daytime minimum load of the substation transformer. SPQ0048 was the first project to exceed the daytime minimum load and was assigned substation upgrades and transfer trip as a result thereof. SPQ0048 executed an Interconnection Agreement which included transfer trip, 57kV voltage transformers, transformer relay upgrades but elected to terminate its Interconnection Agreement and is now out of the queue.

The most recent daytime minimum load values PGE provided you show that the two installations of SPQ0003 and SPQ0028 have failed to exceed the daytime minimum load on the transformer. Carnes Creek Solar's generation will exceed the daytime minimum load. The provided daytime minimum load information is the most relevant as both projects are online and generating. The DTML from 2017 is not relevant as there were no projects completed on the Waconda-13 feeder at that time.

Currently the substation does not have the equipment necessary to enable the 3VO protection scheme necessary when the generation exceeds the load. The substation requirements assigned to Carnes Creek Solar would enable the 3VO protection scheme.

If SPQ0028 does not have transfer trip now, then either PGE's system is already exposed adverse condition without even considering Carnes Creek, or the condition itself is fictional and not real. Therefore, I again request that you send me the DML data so that I can see it for myself. Please send data for 2017 up to November 30, 2017.

As previously stated, SPQ0028 does not have transfer trip as transfer trip is only required when the project exceeds the daytime minimum load of the substation transformer. At the time PGE reviewed SPQ0028 the amount of generation did not exceed the daytime minimum load. The daytime minimum load from 2017 is not relevant for the interconnection of Carnes Creek Solar.

Furthermore, I will not accept any upgrade requirements for the transmission-side of the substation transformer due to the endorsed statements from Brad Hennessey in the system impact study that state the project will not cause any adverse system impacts for the transmission system. I am only required to pay for reasonable costs, and PGE has not provided me with any evidence that proves the costs are objectively reasonable.

PGE contracts with POWER to analyze impacts to the distribution system. POWER produces a document entitled *System Impact Study for Distribution Lines and Equipment*. That document is attached to the SIS as Attachment A (previously designated Appendix A in older system impact studies). POWER's analysis is reviewed by, and may be revised by, PGE's distribution planning engineer and distribution operations engineer. PGE's engineers then use POWER's analysis as an aid to their own analysis. PGE's distribution engineers identify, detail, and evaluate any adverse system impacts to PGE's distribution system in a section of the SIS entitled *Distribution System Modifications*.

The scope of work performed by POWER does not include consideration of impacts to PGE's substation or the transmission system. Impacts to PGE's substation are considered by PGE's protection engineer. If PGE's protection engineer determines that an interconnection will adversely impact the substation then he or she will identify, detail, and evaluate such adverse system impacts in a section of the SIS entitled *Protection Requirements*. Impacts to PGE's transmission system and to other utilities' systems are considered by PGE's transmission planning engineer. If PGE's transmission planning engineer determines that an interconnection will adversely impact the transmission system or another utility's system, then he or she will identify, detail, and evaluate such adverse system impacts in a section of the SIS entitled *Transmission System Modifications*. As there were no transmission impacts due to Carnes Creek Solar, there are no Transmission System Modifications sections within the system impact studies provided to Carnes Creek Solar.

PGE has provided you with a good faith, non-binding cost estimate per the requirements of the Division 82 Rules.

Finally, I am making the conditional request that in the event you do not provide an endorsed facility study, that I would like to have my own third-party contractor perform a new system impact study, and hire my own contractor to perform any associated grid upgrades as is already the practice of PGE throughout its system.

As PGE has noted to you in other correspondence, there is no requirement in statute, rule, Commission order, or the study agreements that requires PGE's engineers to stamp or sign the interconnection studies. None of the Oregon jurisdiction utilities (PGE, PacifiCorp, or Idaho Power) require their engineers to stamp or sign Oregon small

generator interconnection studies because there is no requirement in statute, rule, order, or agreement to do so.

PGE does not agree to allow Carnes Creek Solar to conduct interconnection studies pursuant to OAR 860-082-0060(9). That regulation states that the "public utility and applicant may agree in writing to allow the applicant to hire a third-party consultant to complete a feasibility study, system impact study, or facilities study, subject to public utility oversight and approval." OAR 860-082-0060(9) does not impose any obligation on the utility to agree to allow the applicant to complete studies. Under OAR 860-082-0060(9) the utility has the discretion to say no and to complete all required interconnection studies itself. Additionally, PGE does not agree to allow Carnes Creek Solar to hire a third-party consultant to construct the interconnection facilities and system upgrades required on PGE's system. OAR 860-082-0060(8)(f) does not grant Carnes Creek Solar the right to construct interconnection facilities or system upgrades over PGE's objection. PGE has the right to refuse to agree and to construct the interconnection facilities and system upgrades itself.

I will be sending the Interconnection Agreement for Carnes Creek to you on March 16, 2020.

Regards,

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

From: Jonathan Nelson <jonathan@coniferenergypartners.com>
Sent: Friday, February 14, 2020 2:11 PM
To: Small Power Production <Small.PowerProduction@pgn.com>
Subject: Re: Your System Impact Study Report for SPQ0158 is complete

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

Jason,

The variation of your daytime minimum load numbers in the screenshot you provide and the figures in past interconnection study reports show that the metric does not provide a standardized or objective method to determine which project in the interconnection queue should be responsible for triggering upgrades to mitigate backfeeding. If at any point the substation demand loading is again characteristic of the loading at the time of 1.79 MW on 5/13/2018 referenced in the study for SPQ0048, then by PGE's logic there could be a backfeeding contingency however PGE would not have the necessary equipment to mitigate such contingency because it was not installed as part of SPQ0028 interconnection. Or does PGE already have the necessary equipment to mitigate against such faults?

If SPQ0028 does not have transfer trip now, then either PGE's system is already exposed adverse condition without even considering Carnes Creek, or the condition itself is fictional and not real. Therefore, I again request that you send me the DML data so that I can see it for myself. Please send data for 2017 up to November 30, 2017.

Furthermore, I will not accept any upgrade requirements for the transmission-side of the substation transformer due to the endorsed statements from Brad Hennessey in the system impact study that state the project will not cause any adverse system impacts for the transmission system. I am only required to pay for reasonable costs, and PGE has not provided me with any evidence that proves the costs are objectively reasonable.

Finally, I am making the conditional request that in the event you do not provide an endorsed facility study, that I would like to have my own third-party contractor perform a new system impact study, and hire my own contractor to perform any associated grid upgrades as is already the practice of PGE throughout its system.

-- Jonathan Nelson

Conifer Energy Partners LLC
303-709-9600

On Fri, Feb 14, 2020 at 1:20 PM Small Power Production <Small.PowerProduction@pgn.com> wrote:

Jonathan,

As previously mentioned, the daytime minimum load is constantly changing particularly from year to year and is heavily impacted by the weather and generation. Attached are a couple of screen shots from our software system showing the daytime minimum load for the date provided in the SIS for Carnes Creek. I also included more recent loading information from October which show multiple days in which the load dips below 2 MW's. The loading information from October is with SPQ0028 online and generating. SPQ0028 went in-service on October 4, 2019.

PGE will be providing a Facility Study Report later today.

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

From: Jonathan Nelson <jonathan@coniferenergypartners.com>
Sent: Thursday, February 6, 2020 2:21 PM
To: Small Power Production <Small.PowerProduction@pgn.com>
Subject: Re: Your System Impact Study Report for SPQ0158 is complete

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

Jason,

Do you have any update here? It's been more than two months from your last email.

So far you have provided inconsistent information and admitted that prior information PGE had provided was wrong, and changed key information in the study on a whim to favor PGE's intended outcome for this interconnection. So again I ask that PGE provides me with an explanation of the different daytime minimum load data, the dataset so I can validate your numbers, and an endorsed statement from PGE's engineer that the transmission level upgrades are necessary.

-- Jonathan Nelson

Conifer Energy Partners LLC

303-709-9600

On Thu, Dec 5, 2019 at 10:13 AM Small Power Production <Small.PowerProduction@pgn.com> wrote:

Jonathan,

We are working to see if we can fulfill your request regarding the daytime minimum load information.

As we have previously stated Power Engineering does not evaluate the substation portion of the study process. That work is completed by our internal engineering team.

Regards,

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

From: Jonathan Nelson <jonathan@coniferenergypartners.com>

Sent: Wednesday, December 4, 2019 10:36 AM

To: Small Power Production <Small.PowerProduction@pgn.com>

Subject: Re: Your System Impact Study Report for SPQ0158 is complete

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

Jason,

Will you be providing me with the information I have requested for Carnes Creek?

-- Jonathan Nelson

Conifer Energy Partners LLC

303-709-9600

On Wed, Nov 27, 2019 at 3:39 PM Jonathan Nelson <jonathan@coniferenergypartners.com> wrote:

Jason,

I ask that you please provide me with a response to my questions. The explanation I have been given so far regarding the different daytime minimum load values remains unclear. Furthermore, the associated transmission level upgrades that PGE claims are necessary are refuted by endorsed statements from your own third-party professional engineer.

As the applicant, I am only required to pay the reasonable costs for system upgrades and PGE has the implicit obligation to provide me with information that shows the costs are reasonable. So far, however, I have been supplied with information that is contradictory, as well as inaccurate per your own admission. This is unacceptable and I will not be doing anything with the facility study agreement for Carnes Creek until PGE provides me with an explanation of the different daytime minimum load data, the dataset so I can validate your numbers, and an endorsed statement from PGE's engineer that the transmission level upgrades are necessary. If PGE is unwilling to do this then I will take necessary action to preserve my queue position and get fair treatment.

-- Jonathan Nelson

Conifer Energy Partners LLC

303-709-9600

On Wed, Nov 20, 2019 at 2:46 PM Jonathan Nelson <jonathan@coniferenergypartners.com> wrote:

Jason,

Can you please provide a response to my question on the different daytime minimum load numbers and provide the dataset you are using?

-Jonathan

On Mon, Nov 18, 2019 at 9:55 PM Jonathan Nelson <jonathan@coniferenergypartners.com> wrote:

Jason,

Can you please respond to my message from last Tuesday about the different daytime minimum load numbers between the first SIS for Carnes and the SIS for SPQ0048? Also please send me the dataset you are using.

-- Jonathan Nelson

Conifer Energy Partners LLC

303-709-9600

On Tue, Nov 12, 2019 at 9:09 AM Jonathan Nelson <jonathan@coniferenergypartners.com> wrote:

Jason,

In the original system impact study for Carnes Creek provided to me on 9/7/2018, PGE stated the daytime minimum load on the Waconda BR1 substation transformer was 3.13 MW occurring on 7/01/2018. However in the system impact study for SPQ0048 dated 6/6/2018, PGE stated the daytime minimum load for the Waconda BR1 substation transformer was 1.79 MW occurring on 5/13/2018.

If you use the most recent 12 months' data to determine the daytime min load, why then did PGE state two different values within the same 12 month window for the two above referenced reports?

Can you please provide me with the dataset you are using to determine daytime minimum load so that I can verify your numbers?

-- Jonathan Nelson

Conifer Energy Partners LLC

303-709-9600

On Tue, Nov 12, 2019 at 8:24 AM Small Power Production <Small.PowerProduction@pgn.com> wrote:

Jonathan,

The daytime minimum load will change over time as generation is added to the system and loadings change based on weather. When PGE reviews the daytime minimum loading we review the most recent 12 months.

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

From: Jonathan Nelson <jonathan@coniferenergypartners.com>
Sent: Monday, November 11, 2019 3:41 PM
To: Small Power Production <Small.PowerProduction@pgn.com>
Subject: Re: Your System Impact Study Report for SPQ0158 is complete

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

Jason,

So then were all of the previous studies PGE provided for other developer's projects also incorrect? The table below shows the daytime minimum load for projects connecting to the Waconda substation. This data was sourced from published studies posted on PGE's Oasis website.

Project	Size	Feasibility Study		System Impact Study					
		Feeder	Study Date	Load Date	DTM Load	Study Date	Load Date	DTM Load	
SPQ0003	2.20	Waconda 13			No study available		No study available		
SPQ0028	2.20	Waconda 13	3/19/2017		Not provided in studies		Not provided in studies		
SPQ0048	2.50	Waconda 13	8/18/2017		Not provided in studies	9/20/2018	5/6/2018	1.79	
SPQ0142	3.00	Waconda-River			No study available	7/5/2018	5/13/2018	1.79	
SPQ0158	2.50	Waconda 13	5/25/2018		5/13/2018	1.79	9/7/2018	7/1/2018	3.13
SPQ0172	2.25	Waconda 13	8/16/2018		5/13/2018	1.19	10/25/2019	5/13/2018	1.79
SPQ0194	2.16	Waconda-River			No study available		No study available		
SPQ0223	1.98	Waconda-River			No study available		No study available		

-- Jonathan Nelson

Conifer Energy Partners LLC
303-709-9600

On Mon, Nov 11, 2019 at 10:40 AM Small Power Production <Small.PowerProduction@pgn.com> wrote:

Jonathan,

The daytime minimum load included in the report was incorrect. The daytime minimum load for Waconda-13 is 1.1 MW for the feeder and 2.4 MW for the substation transformer. SPQ0028 falls short of causing power to flow back onto the transmission system and therefore is not responsible for the substation upgrades outlined in the Carnes Creek Solar SIS report. I have attached a revised SIS which contains the correct daytime minimum load.

PGE would like to apologize for the confusion. However, the interconnection requires outlined in the report are accurate.

As previously stated, the Power Engineers report only addresses the distribution system review/requirements. The additional requirements are not in the scope of Power Engineers work. Power Engineers performed a complete analysis for the work they were asked to do. PGE has no reason to believe their work is incomplete or false. All analysis and requirements provided in Power Engineers report was reviewed by PGE Engineers.

The protection requirements section was completed and the requirements determined to be necessary by PGE Engineers.

Regards,

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

From: Jonathan Nelson <jonathan@coniferenergypartners.com>
Sent: Tuesday, November 5, 2019 2:19 PM
To: Small Power Production <Small.PowerProduction@pgn.com>
Subject: Re: Your System Impact Study Report for SPQ0158 is complete

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

Hello,

I had a question regarding the applicability of the protection requirements prescribed in the report.

If the daytime minimum load on the transformer was 1.34MW on 5/28/2019, why isn't SPQ0028 taking care of the new relays, VTs, and transfer trip? The report shows that SPQ0028 is still under construction and has an output of 2.2MW which is greater than the transformer daytime minimum load and would therefore create the stated overvoltage condition from backflow prior to Carnes Creek.

Why hasn't the protection scheme already been implemented by SPQ0028?

Furthermore, the endorsed study results from Brad Hennessey at Power Engineers says the following on page 3:

"This generator interconnection is expected to backfeed onto the transmission system during periods of light load. The low level of backfeed is not expected to cause or worsen any thermal, voltage, or stability concerns for the transmission system."

The Power Engineers study then only prescribes a new service and metering package at a cost of \$30,000. On what basis is PGE requiring the overvoltage protection requirements given the endorsed statement above from Mr. Hennessey?

Please provide a response as soon as possible so that I can decide whether to proceed with the facility study.

-Jonathan Nelson

On Fri, Oct 25, 2019 at 3:56 PM PowerClerk Notifications <DoNotReply@powerclerk.com> wrote:

Dear Jonathan,

The completed System Impact Study Report for the above referenced project is attached to this email.

The Facility Study Agreement for the above referenced project will be emailed via DocuSign.

The agreement provides information on what will be included in the study, a study timeline and the estimated costs.

You must sign and return the Study Agreement and pay the deposit within **15** business days. If the Facility Study Agreement and deposit are not received within this timeframe, the application will automatically be withdrawn.

If you have any questions about the System Impact Study Agreement, you can reply directly to Small.PowerProduction@pgn.com or call 503-464-8300.

Thank you,

PGE's Transmission and Distribution Interconnection Services Team

--

-- Jonathan Nelson

Conifer Energy Partners LLC

303-709-9600

--

-- Jonathan Nelson

Conifer Energy Partners LLC

303-709-9600

Attachment D

**Letter from Nimbus Power Engineers, LLC to Carnes Creek
Dated March 24, 2020**



March 24th, 2020
15702 S Redland Rd.
Oregon City, OR 97045
nimbuspowerengineers.com

Dear Jonathan Nelson,

I have reviewed the email correspondence between you and PGE from October 25, 2019 and March 16, 2020 regarding the interconnection of your Carnes Creek Solar project (Carnes Creek) and PGE's use of minimum daytime load (MDL) data to determine relay protection requirements for mitigating 3V0 neutral shift ground faults. The various MDL values, the data provided in the PI data screenshots, and the reference to using hourly averages to determine protective relay requirements suggests conflicting rationale relating to 3V0 requisite for Carnes Creek's interconnection.

From previous work on similar interconnections on PGE's system, PGE primarily uses the MDL in interconnection studies to determine if a given project will contribute to backfeeding into the substation during light loading periods. It is my understanding that PGE typically has a substation designed with the ground reference occurring from the transmission system. It is possible to have the transmission system trip offline during a single line to ground fault located at the substation. The transmission system tripping free would cause the substation to lose its ground reference, which would then cause the ground reference to shift to the grounded phase. The voltage drop from line to ground then becomes line to line, or root (3) larger in magnitude. The substations are required to be sized for this shift in a fault event, but PGE is concerned the continuation of the elevated voltage incident may occur when a solar site is back-feeding into their system. PGE proposes the addition of an over-voltage summing relay called 3V0 that is used to detect these ground reference shifts, along with transfer trip to turn Carnes Creek offline when the relay detects a ground reference shift. Projects with expected generation that is in excess of the MDL at the substation transformer may require this additional protective relaying. The requirement is imposed on the first project in the queue with output that exceeds the MDL, i.e. the first project that contributes incremental generation sufficient to push the MDL negative (backfeeding).

The System Impact Study (SIS) for Carnes Creek dated October 25, 2019 on page five states that the MDL on the Waconda substation transformer is 1.34 MW, occurring on May 28, 2019. On November 5, 2019 you inquired with PGE why a project under construction with a nameplate capacity of 2.2 MW (queue number SPQ0028) was not responsible for the requirements to prevent backfeeding since its nameplate capacity was greater than the MDL stated in the October 25, 2019 SIS for Carnes Creek. PGE responded on November 11, 2019 with Mr. Jason Zappe stating that the MDL value originally stated in the SIS for the Waconda substation transformer was incorrect and the correct value was 2.4 MW occurring on May 5, 2019. PGE provided a revised report that contained the new MDL value of 2.4 MW. By PGE's logic and standards, an MDL of 2.4 MW would indicate there would be potential backfeeding into the substation transformer when Carnes Creek is at full output along with other generators connected to the substation. This would make Carnes Creek responsible for the 3V0 relaying requirement since the addition of its output would exceed the MDL of 2.4 MW.

In reply to PGE, you requested on November 12, 2019 that PGE provide you with the MDL dataset they were using in reference to the SIS for Carnes Creek so that you could validate PGE's statements regarding the original number PGE claims was provided in error, as well as the new revised number. On February 14, 2020, PGE responded stating that SPQ0028 was officially in service on October 4, 2019 and PGE provided a screenshot from its PI data software showing loading information prior to the in-service date of SPQ0028 from May 5, 2019, the date of the MDL number in the revised SIS. Mr. Zappe's highlighted data point in the PI screenshot showed the Waconda BR1 transformer was loaded at 2.48 MW at 1:27:05 PM on May 5, 2019. On the other hand, the PI screenshot also shows the minimum/maximum loading; it shows minimum loading of 2.01 MW at 10:38:36 AM. This value occurred approximately five months prior to the commissioning of SPQ0022 and is less than that project's nameplate capacity of 2.2 MW. This shows that SPQ0022 can cause a possible backfeeding condition and 3V0 event, even without Carnes Creek interconnected. Therefore, based on PGE's statements and standards, the preceding facility that is now operational should have provided the 3V0 upgrade as part of its interconnection requirements. The potential for ground reference shifts PGE desires to protect against now exist (due to SPQ0028) without even considering Carnes Creek.

In response to your questioning, Mr. Zappe also provided MDL data from October 19, 2019 with SPQ0028 in operation showing loading of 1.29 MW at 1:28:54 PM. This number shows that SPQ0028 does not backfeed in the month of October; that does not mean that it will not backfeed during the month of May.

You addressed PGE's approach in emails to Mr. Zappe on February 14, 2020, and March 6, 2020. In Mr. Zappe's most recent response from March 16, 2020 he states that PGE does not look at MDL values on an instantaneous basis, but rather on an hourly average basis. Mr. Zappe's answer is technically deficient for the following reason.

The 3V0 relay will most likely follow a protection scheme that is similar in nature and found in PGE's interconnection standard. These are the under and over-voltage relays (type 59/27). These relays have pickup times of 10 cycles or 0.16 seconds according to PGE's standards. Furthermore, the typical substation design has a surge arrester or lightning gap designed to discharge during high voltage conditions, in some designs current flow through these devices is detected resulting in relay action. These devices typically having an operational duration capability of nothing more than a few minutes at most, and definitely does not have an hourly duration capability. Therefore, the suggestion by Mr. Zappe that PGE looks at MDL data on an hourly average basis to assess protection risks associated with ground reference shifts from back-feeding and prescribe relay function requirements does not correspond to any technical reasoning and is unfounded; the statement does not equate to the operational duration capabilities of the equipment PGE desires to protect. This relay needs to operate at a speed fast enough to protect substation equipment and therefore the MDL needs to be based upon an instantaneous value and not average values. Additionally, relay settings based on hourly average assumptions are infeasible to be implemented in relay design and programming.

Although even if the data did support PGE's assignment of the 3V0 requirement to Carnes Creek based on PGE's standards, whether or not the requirement is necessary remains an open question due to an endorsed statement by Mr. Bradley James Hennessey of POWER Engineers on pages 11 and 16 of the SIS that suggests even with backfeed during light loading periods that it "is not expected to cause or worsen any thermal, voltage, or stability concerns for the transmission system." The 3V0 condition occurs on the high side of the substation transformer at the terminals of the 57 kV transmission system. Mr. Hennessey's endorsed statement suggests Carnes Creek would not cause any new 3V0 contingencies requiring protection. Despite this, PGE has made its own opinion in the SIS and suggested there is a need for the 3V0 relay. The document endorsed by POWER Engineers is an engineered document. PGE's alternative conclusions make any engineered recommendations by POWER Engineers nugatory and should be represented in like by PGE's own engineer. PGE may choose to design their own projects with or against engineered methods, but in this instance Carnes Creek is PGE's engineering customer for the interconnection studies and is required to pay for the interconnection upgrades. Therefore, the work involved with this site ought to be conducted in accordance with engineering laws meant to safeguard the public wellbeing.

You addressed the conflict between Mr. Hennessey's statement and PGE's opinion on November 5, 2019. Mr. Zappe's replied on November 11, 2019 stating that transmission level analysis and requirements are not part of POWER Engineers' scope of work. This continues to raise the question that I have had with certain aspects of these interconnection studies, like 3V0 relaying. Where is the line drawn for responsibility when interconnecting a distributed energy resource like Carnes Creek? On one hand, PGE thinks the cause for possible overvoltage conditions on the transmission level system is due to distribution level facilities like Carnes Creek. On the other hand, PGE limits the scope of its consulted studies to exclude transmission level impacts. This does not make sense. Mr. Hennessey is right to assess the transmission level impacts considering this is required by the Small Generator Interconnection Rules and of concern to PGE.

Another inconsistency between POWER Engineers' study and PGE's own assessment is the estimated interconnection cost for Carnes Creek. Mr. Hennessey estimated the cost to interconnect Carnes Creek at \$30,000. PGE, however, estimates the interconnection costs to be \$768,900. The huge difference is of multiple orders of magnitude and raises serious questions of validity which PGE has not objectively supported to you. It is my estimation that PGE's estimate includes labor and material that is well outside the scope of the SIS.

Regards,
Jonathan M Denman PE
Owner/ Principal Engineer



Jonathan Denman Oregon Seal

2020.04.01 10:37:11-08'00

Attachment E

Letter from PGE to Carnes Creek

Dated Apr. 8, 2020



Portland General Electric
121 SW Salmon Street · Portland, Ore. 97204

April 8, 2020

Carnes Creek Solar, LLC
C/O Conifer Energy Partners, LLC
Attn: Jonathan Nelson
4207 SE Woodstock Blvd, #326
Portland, OR 97206

Re: *SPQ0158 (Carnes Creek) – Interconnection Agreement*

Dear Jonathan,

Per our e-mail correspondence, because of a change in the queue, the estimated costs to interconnect Carnes Creek have increased, as reflected in the system impact study and facilities study. The attached amendment to the Interconnection Agreement for the Carnes Creek project reflects the findings from the system impact and facilities studies and is PGE's good faith, non-binding cost estimate for the system upgrades associated with the Carnes Creek interconnection. Per OAR 860-082-0035(5), PGE cannot begin work on the system upgrades without written agreement that Carnes Creek accepts the estimate.

Please sign and return the attached amendment to PGE on or before April 15, 2020. Carnes Creek's failure to return a signed Amendment by the aforementioned date will result in the withdrawal of the project from the queue.

If you have any questions, please contact me at Small.PowerProduction@pgn.com or call 503-464-8300.

Regards,

A handwritten signature in blue ink, appearing to read "J. Zappe", is written over a light blue circular stamp.

Jason Zappe
Interconnection Specialist
Portland General Electric

FIRST AMENDMENT
TO INTERCONNECTION AGREEMENT FOR SMALL GENERATOR FACILITY /
CARNES CREEK SOLAR, LLC

This First Amendment (“Amendment”) to the Interconnection Agreement for Small Generator Facility dated May 6, 2019 (“Agreement”) by and between Portland General Electric Company (“PGE”) and Carnes Creek Solar, LLC (“Applicant”) is effective as of April 15, 2020.

WHEREAS, the Parties agree to revise Attachment A to the Agreement (Description and Costs of Minor Modifications, Interconnection Facilities, System Upgrades, and Adverse System Impacts) and Attachment B to the Agreement (Scope of Work/Milestones).

NOW, THEREFORE, for and in consideration of the mutual promises of the Parties as set forth herein, and other valuable consideration, the receipt and sufficiency of which is hereby acknowledged, the Parties agree as follows:

Attachment A and Attachment D of the Agreement are deleted in their entirety and replaced with Attachment A(v2) and Attachment D(v2), attached hereto and incorporated herein.

In the event there is a conflict between this Amendment and the Agreement, this Amendment shall prevail. All other provisions of the Agreement remain in full force and effect. No amendment to the terms and conditions of this Amendment shall be valid and binding on the parties unless made in writing and signed by an authorized representative of each of the parties. This Amendment is subject to the terms and conditions set forth in the Agreement. Disputes regarding interpretation of this Amendment will be resolved pursuant to the dispute resolution process set forth in the Agreement.

Carnes Creek Solar, LLC

Portland General Electric Company

Signature: _____
Printed
Name: _____
Title: _____
Date: _____

Signature: _____
Printed
Name: _____
Title: _____
Date: _____

Attachment A (v2)

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

The Facility Study identified the following Interconnection Requirements.

- To properly service the generation facility, the installation of a new primary service and metering package will be needed.
- The generation facility will be required to use dynamic VAR support.
- Installation of dual SEL-487E substation transformer relay panels.
- Installation of a set of voltage transformers (VT's) on the 57 kV system.
- Transfer trip to the DER via Mirror Bits over a fiber optic cable.

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.

In the Waconda substation PGE will engineer, install and maintain the replacement of the substation transformer relay panels. PGE will also install the 57 kV voltage transformers.

A transfer trip protection scheme will be engineered, installed and maintained by PGE. A fiber optic cable will run from the Waconda Substation to the point of interconnection along the existing distribution route which is approximately 2.36 miles. PGE's preferred method for transfer trip is SEL Mirror Bits Protocol.

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 and PT's. The CT's and PT'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 patch panels can reside. The Interconnection Customer owned relay

can also be placed inside the communications cabinet. The Interconnection Customer will be responsible for purchasing, installing and programming the relay for transfer trip. Prior to testing, a copy of the relay settings 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.

Distribution Modifications	\$30,000.00
Protection Requirements	\$484,900.00
Communications Requirements	\$254,000.00
Total	\$768,900.00

Attachment D (v2)

Scope of Work/Milestones

In-Service Date: September 6, 2021

Critical milestones and responsibility as agreed to by the Parties:

	Milestone/Date	Responsible Party
(1)	<u>Executed Interconnection Agreement / 4-15-2020</u>	<u>Carnes Creek Solar</u>
(2)	<u>\$10,000 of Estimated Cost / 4-29-2019</u>	<u>Carnes Creek Solar</u>
(3)	<u>Certificate of Insurance / 4-29-2020</u>	<u>Carnes Creek Solar</u>
(4)	<u>Scaled Site Plan Drawings / 5-8-2020</u>	<u>Carnes Creek Solar</u>
(5)	<u>Engineering Design Starts / 6-8-220</u>	<u>PGE</u>
(6)	<u>\$252,967 of Estimated Cost / 7-10-2020</u>	<u>Carnes Creek Solar</u>
(7)	<u>*Engineering Design Complete / 1-29-2021</u>	<u>PGE</u>
(8)	<u>\$252,967 of Estimated Cost / 2-26-2021</u>	<u>Carnes Creek Solar</u>
(9)	<u>PGE Construction Scheduled / 2-26-2021</u>	<u>PGE</u>
(10)	<u>\$252,966 of Estimated Cost / 6-25-2021</u>	<u>Carnes Creek Solar</u>
(11)	<u>Switchgear Installed and Inspection / 7-23-2021</u>	<u>Carnes Creek Solar</u>
(12)	<u>Interconnection Facilities Complete / 8-6-2021</u>	<u>PGE</u>
(13)	<u>Testing and Commissioning / 8-20-2021</u>	<u>Carnes Creek Solar</u>
(14)	<u>In-Service Date / 9-6-2021</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 F

Email from Marion County to Carnes Creek

Dated Apr. 16, 2020



Jonathan Nelson <jonathan@coniferenergypartners.com>

Permit timeline for CU-18-023, Carnes Creek Solar

Gilman Fennimore <GFENNIMORE@co.marion.or.us>
To: Jonathan Nelson <jonathan@coniferenergypartners.com>

Thu, Apr 16, 2020 at 7:22 AM

Jonathan,

The use must be implemented by September 4, 2020.

Joe Fennimore
Planning Director
Marion County

>>> Jonathan Nelson <jonathan@coniferenergypartners.com> 4/14/2020 10:42 AM >>>
Hi there Mr. Fennimore,

I am the developer of the solar project referenced in the application and approval for CU-18-023 on Jerry Ruiz's property in Marion County.

https://www.co.marion.or.us/BOC/Documents/PW_Planning_082918_RechODDecision.CU18-023.Ruiz.pdf

The effective date of the approval is listed as September 5, 2018. I wanted to clarify the time allowed to initiate the use until the CUP expires. Can you please respond confirming how much time remains on the CUP before it expires if the use is not initiated?

Thank you and kind regards,

-- Jonathan Nelson
Conifer Energy Partners LLC
303-709-9600

WARNING: This email originated outside of Marion County.
DO NOT CLICK links or attachments unless you trust the sender and know the content is safe.

Click [here](#) to learn more or Click [here](#) to report as spam.

Attachment G

Marion County BOC Ordinance 1387

**BEFORE THE BOARD OF COMMISSIONERS
FOR MARION COUNTY, OREGON**

In the Matter of an Ordinance Amending Marion)
County Code, Title 17 (Rural -Zone Code))
Provisions and Declaring an Emergency)

AN ADMINISTRATIVE ORDINANCE

ORDINANCE NO. 1387

THE MARION COUNTY BOARD OF COMMISSIONERS HEREBY ORDAINS AS
FOLLOWS:

SECTION I. Purpose

This ordinance is enacted pursuant to the authority granted to general law counties in the State of Oregon by ORS Chapters 197 and 215 to implement the County Comprehensive Plan by amending the Marion County Code provisions related to rural zoning.

SECTION II. Authorization

The Marion County Board of Commissioners initiated legislative amendments to the Marion County Rural Zone Code, and referred the matter to the Marion County Planning Commission for a recommendation, by Resolution 17R-31, dated December 27, 2017. On January 31, 2018, the Marion County Board of Commissioners replaced Resolution 17R-31 by adopting Resolution 18R-1, which did not refer the matter to the Marion County Planning Commission. The Marion County Board of Commissioners held a public hearing on March 14, 2018, for which proper notice and advertisement were given. All persons present during the public hearing were given the opportunity to speak or present written statements. The hearing was closed and the Board considered the Planning Division file, all arguments of the parties and is otherwise fully advised in the premises.

SECTION III. Evidence and Conclusion

Under Oregon state law and administrative rules, the county can choose whether or not to allow photovoltaic solar arrays to be placed in farm zones. If a county chooses to allow these uses, Oregon Revised Statutes require them to be subject to obtaining a conditional use permit and Oregon Administrative Rules contain minimum standards that must be satisfied. Counties can adopt more restrictive standards and criteria. Marion County considered adopting more restrictive standards and decided to repeal the use entirely from the EFU (Exclusive Farm Use) and SA (Special Agriculture) zones.

The amendments of the Marion County Rural Zone Code made hereunder are based on consideration and analysis of the operation of present zoning regulations and provisions of ORS Chapters 197 and 215 and the State Land Use Goals and related Oregon Administrative Rules. Due consideration was given to testimony in the hearing. The Board finds that the revision to the Rural Zone Code is in compliance with State Land Use Goals, the applicable policies in the Marion County Comprehensive Plan, and with ORS 197 and ORS 215.

SECTION IV. Amendments

Title 17 MCC (Marion County Rural Zone Code) is amended as set forth in Exhibit A, attached hereto and incorporated herein.

SECTION V. Severability and Savings Clause

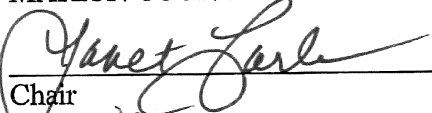
Should any section, subsection, paragraph, sentence, clause or phrase of this ordinance, or any policy, provision, finding, statement, conclusion, or designation to a particular land use or area of land, or any other portion, segment or element of this ordinance or of the amendments adopted hereunder, be declared invalid for any reason, that declaration shall not affect the validity of any provision of this ordinance or of any other Marion County Code provisions amended herein.


SECTION VI. Effective Date

This ordinance being necessary to protect the public health, safety and welfare, an emergency is declared to exist and this ordinance shall become effective upon its passage.

SIGNED and FINALIZED this 21 day of March 2018,
2018, at Salem, Oregon.

MARION COUNTY BOARD OF COMMISSIONERS


Chair


Recording Secretary

JUDICIAL NOTICE

Oregon Revised Statutes, Chapter 197.830, provides that land use decisions may be reviewed by the Land Use Board of Appeals by filing a notice of intent to appeal within 21 days from the date this Ordinance becomes final.

EXHIBIT A

DELETIONS IN STRIKEOUT

Chapter 17.120

SPECIFIC CONDITIONAL USES

Sections:

Article I. Specific Conditional Uses

- 17.120.010 Mobile home parks.
- 17.120.020 Duplex on a corner lot.
- 17.120.030 Boat, camper, and trailer storage area or lot.
- 17.120.040 Temporary use of mobile home or recreational vehicle during certain hardship conditions.
- 17.120.050 Custom cabinet shop and sales firm.
- 17.120.075 Conditional home occupations.
- 17.120.080 Wireless communications facilities.
- 17.120.090 Agri-tourism events and activities.
- 17.120.100 Wind power generation facilities.
- ~~17.120.110 Photovoltaic solar power generating facilities.~~
- 17.120.120 Medical marijuana businesses.

~~17.120.110 Photovoltaic solar power generating facilities.~~

~~Photovoltaic solar power generating facilities shall be subject to the following criteria and definitions:~~

~~A. Definitions:~~

- ~~1. "Arable land" means land in a tract that is predominately cultivated or, if not currently cultivated, predominantly comprised of arable soils.~~
- ~~2. "Arable soils" means soils that are suitable for cultivation as determined by the governing body or its designate based on substantial evidence in the record of a local land use application, but "arable soils" does not include high value farmland soils described in ORS 195.300(10) unless otherwise stated.~~
- ~~3. "Nonarable land" means land in a tract that is predominately not cultivated and predominately composed of nonarable soils.~~
- ~~4. "Nonarable soils" means soils that are not suitable for cultivation. Soils with an NRCS agricultural capability classes V through VIII and no history of irrigation shall be considered nonarable land in all cases. The governing body or its designate may determine other soils, including soils with a past history of irrigation, to be nonarable based on substantial evidence in the record of a local land use application.~~
- ~~5. "Photovoltaic solar power generation facility" includes, but is not limited to, an assembly of equipment that converts sunlight into electricity and then stores, transfers, or both, that electricity. This includes photovoltaic modules, mounting and solar tracking equipment, foundations, inverters, wiring, storage devices and other components. Photovoltaic solar power generation facility also includes electrical cable collection systems connecting the photovoltaic solar power generation facility to a transmission line, all necessary grid integration equipment, new or expanded private roads constructed to serve the photovoltaic solar power generation facility, office, operation and maintenance buildings, staging areas and all other necessary appurtenances. For purposes of applying the acreage standards of this section, a photovoltaic solar power generation facility includes all existing and proposed facilities on a single tract, as well as any existing and proposed facilities determined to be under common ownership on lands with fewer than 1,320 feet of separation from the tract on which the new facility is proposed to be sited. Projects connected to the same parent company or individuals shall be considered to be in common ownership, regardless of the~~

operating business structure. A photovoltaic solar power generation facility does not include a net metering project consistent with ORS 757.300 and OAR Chapter 860, Division 039 or a feed-in tariff project established consistent with ORS 757.365 and OAR Chapter 860, Division 084.

B. For high value farmland soils described at ORS 195.300(10), the following must be satisfied:

1. A photovoltaic solar power generation facility shall not preclude more than 12 acres from use as a commercial agricultural enterprise unless an exception is taken pursuant to ORS 197.732 and OAR Chapter 660, Division 004;

2. The proposed photovoltaic solar power facility will not create unnecessary negative impacts on agricultural operations conducted on any portion of the subject property not occupied by project components. Negative impacts could include, but are not limited to, the unnecessary construction of roads dividing a field or multiple fields in such a way that creates small or isolated pieces of property that are more difficult to farm, and placing photovoltaic solar power generation facility project components on lands in a manner that could disrupt common and accepted farming practices;

3. The presence of a photovoltaic solar power generation facility will not result in unnecessary soil erosion or loss that could limit agricultural productivity on the subject property. This provision may be satisfied by the submittal and county approval of a soil and erosion control plan prepared by an adequately qualified individual, showing how unnecessary soil erosion will be avoided or remedied and how topsoil will be stripped, stockpiled and clearly marked. The approved plan shall be attached to the decision as a condition of approval;

4. Construction or maintenance activities will not result in unnecessary soil compaction that reduces the productivity of soil for crop production. This provision may be satisfied by the submittal and county approval of a plan prepared by an adequately qualified individual, showing how unnecessary soil compaction will be avoided or remedied in a timely manner through deep soil decompaction or other appropriate practices. The approved plan shall be attached to the decision as a condition of approval;

5. Construction or maintenance activities will not result in the unabated introduction or spread of noxious weeds and other undesirable weeds species. This provision may be satisfied by the submittal and county approval of a weed control plan prepared by an adequately qualified individual that includes a long-term maintenance agreement. The approved plan shall be attached to the decision as a condition of approval;

6. The project is not located on high value farmland soil unless it can be demonstrated that:

a. Non-high value farmland soils are not available on the subject tract; or

b. Siting the project on non-high value farmland soils present on the subject tract would significantly reduce the project's ability to operate successfully; or

c. The proposed site is better suited to allow continuation of an existing commercial farm or ranching operation on the subject tract than other possible sites also located on the subject tract, including those comprised on non-high value farmland soils;

7. A study area consisting of lands zoned for exclusive farm use located within one mile measured from the center of the proposed project shall be established and:

a. If fewer than 48 acres of photovoltaic solar power generation facilities have been constructed or received land use approvals and obtained building permits within the study area, no further action is necessary;

b. When at least 48 acres of photovoltaic solar power generation facilities have been constructed or received land use approvals and obtained building permits, either as a single project or multiple facilities within the study area, the local government or its designate must find that the photovoltaic solar power generation facility will not materially alter the stability of the overall land use pattern of the area. The stability of the overall land use pattern of the area will be materially altered if the overall

effect of existing and potential photovoltaic solar power generation facilities will make it more difficult for the existing farms and ranches in the area to continue operation due to diminished opportunities to expand, purchase or lease farmland or acquire water rights, or will reduce the number of tracts or acreage in farm use in a manner that will destabilize the overall character of the study area.

C. For arable lands the following must be satisfied:

1. A photovoltaic solar power generation facility shall not preclude more than 20 acres from use as a commercial agricultural enterprise unless an exception is taken pursuant to ORS 197.732 and OAR Chapter 660, Division 004;

2. The proposed photovoltaic solar power facility will not create unnecessary negative impacts on agricultural operations conducted on any portion of the subject property not occupied by project components. Negative impacts could include, but are not limited to, the unnecessary construction of roads dividing a field or multiple fields in such a way that creates small or isolated pieces of property that are more difficult to farm, and placing photovoltaic solar power generation facility project components on lands in a manner that could disrupt common and accepted farming practices;

3. The presence of a photovoltaic solar power generation facility will not result in unnecessary soil erosion or loss that could limit agricultural productivity on the subject property. This provision may be satisfied by the submittal and county approval of a soil and erosion control plan prepared by an adequately qualified individual, showing how unnecessary soil erosion will be avoided or remedied and how topsoil will be stripped, stockpiled and clearly marked. The approved plan shall be attached to the decision as a condition of approval;

4. Construction or maintenance activities will not result in unnecessary soil compaction that reduces the productivity of soil for crop production. This provision may be satisfied by the submittal and county approval of a plan prepared by an adequately qualified individual, showing how unnecessary soil compaction will be avoided or remedied in a timely manner through deep soil decompaction or other appropriate practices. The approved plan shall be attached to the decision as a condition of approval;

5. Construction or maintenance activities will not result in the unabated introduction or spread of noxious weeds and other undesirable weeds species. This provision may be satisfied by the submittal and county approval of a weed control plan prepared by an adequately qualified individual that includes a long term maintenance agreement. The approved plan shall be attached to the decision as a condition of approval;

6. The project is not located on high value farmland or arable soils unless it can be demonstrated that:

a. Nonarable soils are not available on the subject tract; or

b. Siting the project on nonarable soils present on the subject tract would significantly reduce the project's ability to operate successfully; or

c. The proposed site is better suited to allow continuation of an existing commercial farm or ranching operation on the subject tract than other possible sites also located on the subject tract, including those comprised of nonarable soils;

7. A study area consisting of lands zoned for exclusive farm use located within one mile measured from the center of the proposed project shall be established and:

a. If fewer than 80 acres of photovoltaic solar power generation facilities have been constructed or received land use approvals and obtained building permits within the study area, no further action is necessary;

b. When at least 80 acres of photovoltaic solar power generation facilities have been constructed or received land use approvals and obtained building permits, either as a single project or multiple facilities within the study area, the local government or its designate must find that the photovoltaic solar power generation facility will not materially alter the stability of the overall land use pattern of

the area. The stability of the overall land use pattern of the area will be materially altered if the overall effect of existing and potential photovoltaic solar power generation facilities will make it more difficult for the existing farms and ranches in the area to continue operation due to diminished opportunities to expand, purchase or lease farmland or acquire water rights, or will reduce the number of tracts or acreage in farm use in a manner that will destabilize the overall character of the study area.

D. For nonarable lands the following must be satisfied:

1. A photovoltaic solar power generation facility shall not preclude more than 100 acres from use as a commercial agricultural enterprise unless an exception is taken pursuant to ORS 197.732 and OAR Chapter 660, Division 004;
2. No more than 12 acres of the project will be sited on high value farmland soils described in ORS 195.300(10);
3. No more than 20 acres of the project will be sited on arable soils unless an exception is taken pursuant to ORS 197.732 and OAR Chapter 660, Division 004;
4. Construction or maintenance activities will not result in the unabated introduction or spread of noxious weeds and other undesirable weeds species. This provision may be satisfied by the submittal and county approval of a weed control plan prepared by an adequately qualified individual that includes a long term maintenance agreement. The approved plan shall be attached to the decision as a condition of approval;
5. The project is not located on high value farmland or arable soils unless it can be demonstrated that:
 - a. Siting the project on nonarable soils present on the subject tract would significantly reduce the project's ability to operate successfully; or
 - b. The proposed site is better suited to allow continuation of an existing commercial farm or ranching operation on the subject tract than other possible sites also located on the subject tract, including those comprised of nonarable soils;
6. If a photovoltaic solar power generation facility is proposed to be developed on lands that contain a Goal 5 resource protected under the county's comprehensive plan, and the plan does not address conflicts between energy facility development and the resource, the applicant and the county, together with any state or federal agency responsible for protecting the resource or habitat supporting the resource, will cooperatively develop a specific resource management plan to mitigate potential development conflicts. If there is no program present to protect the listed Goal 5 resource(s) present in the local comprehensive plan or implementing ordinances and the applicant and the appropriate resource management agency(ies) cannot successfully agree on a cooperative resource management plan, the county is responsible for determining appropriate mitigation measures; and
7. If a photovoltaic solar power generation facility is proposed, prior to January 1, 2022, to be located on land where the potential exists for adverse effects to state or federal special status species (threatened, endangered, candidate, or sensitive), or to wildlife species of concern identified and mapped by the Oregon Department of Fish and Wildlife (including big game winter range and migration corridors, golden eagle and prairie falcon nest sites, and pigeon springs), the applicant shall conduct a site specific assessment of the subject property in consultation with all appropriate state, federal, and tribal wildlife management agencies. A professional biologist shall conduct the site specific assessment by using methodologies accepted by the appropriate wildlife management agency and shall determine whether adverse effects to special status species or wildlife species of concern are anticipated. Based on results of the biologist's report, the site shall be designed to avoid adverse effects to state or federal special status species or to wildlife species of concern described above. If the applicant's site specific assessment shows that adverse effects cannot be avoided, the applicant and the appropriate wildlife management agency will cooperatively develop an agreement for project specific mitigation to offset the potential adverse effects of the facility. Where the applicant and resource management agency cannot agree on what mitigation will be carried out, the county is responsible for determining appropriate mitigation, if any, required for the facility.

~~E. A condition of any approval for a photovoltaic solar power generation facility shall require the project owner to sign and record in the deed records of Marion County a document binding the project owner and project owner's successor in interest, prohibiting them from pursuing a claim for federal relief or cause of action alleging injury from farming or forest practices defined in ORS 30.930(2) and (4).~~

~~F. Nothing in this section shall prevent a county from requiring a bond or other security from a developer or otherwise imposing on a developer the responsibility for retiring the photovoltaic solar power generation facility.~~

Chapter 17.136 EFU (EXCLUSIVE FARM USE) ZONE

17.136.050 Conditional uses.

The following uses may be permitted in an EFU zone subject to obtaining a conditional use permit and satisfying the criteria in MCC 17.136.060(A), and any additional criteria, requirements, and standards specified for the use:

F. The following utility uses:

1. Commercial utility facilities for the purpose of generating power, other than wind power generation or photovoltaic solar power generation, for public sale, subject to MCC 17.136.060(F).
2. Wind power generation facilities subject to MCC 17.120.100.
3. ~~Photovoltaic solar power generating facilities subject to MCC 17.120.110.~~
4. Transmission towers over 200 feet in height.

Chapter 17.137 SA (SPECIAL AGRICULTURE) ZONE

17.137.050 Conditional uses.

The following uses may be permitted in an SA zone subject to obtaining a conditional use permit and satisfying the criteria in MCC 17.137.060(A) and any additional criteria, requirements, and standards specified in this section:

F. The following utility uses:

1. Commercial utility facilities for the purpose of generating power, other than wind power generation or photovoltaic solar power generation, for public sale, subject to MCC 17.137.060(E).
2. Wind power generation facilities subject to MCC 17.120.100.
3. ~~Photovoltaic solar power generating facilities subject to MCC 17.120.110.~~
4. Transmission towers over 200 feet in height.