NewSun ENERGY

August 7, 2020

Via Electronic Filing

Oregon Public Utility Commission
Attention: Filing Center
201 High Street, Suite 100
Post Office Box 1088
Salem, OR 97308-1088

Re: UM 2108– PacifiCorp Interconnection Queue Reform
August 11, 2020 Public Meeting Regular Agenda Item No. RA4

Dear Commissioners:

NewSun Energy respectfully submits the following comments on PacifiCorp's (PAC) interconnection queue reform proposal in advance of the Oregon Public Utility Commission (PUC or Commission) public meeting scheduled for August 11, 2020 in Docket No. UM 2108. NewSun supports the comments submitted by the Lacomb Irrigation District and well as those filed by the Interconnection Customer Coalition.[1] Staff's recommendations would generally improve the process (relative to PacifiCorp's initial proposal), but there are still *major* issues with PAC's proposal.

Most notably, there are still likely to be issues with the way PAC conducts its power flow studies, which undermine the intent of queue reform itself, likely resulting in continued substantively wrong study and cost outcomes, as well as other features which, in addition to being punitive, discouraging to QFs, and lacking clarity on key issues, are likely to quagmire and frustrate the objectives this Commission should have: A stable, reliable, *investable* climate for qualifying facility (QF) and non-QF development in Oregon.

But PAC's proposals, individually and cumulatively, undermine the investments energy project developers made in developing renewable energy projects in this state and the faith those developers place in the interconnection process, laws, and PUC directives, as well as the future development investment climate. The interconnection process is the bedrock upon which investments in electricity generation are made. Without fair and open access to interconnection and transmission facilities and a process that is stable and predictable, new generation from non-utility-owned generators will simply not occur, either because the utility will refuse to offer access to its system or because the non-utility generator will simply lose faith in the system, or both. PAC proposes to completely change the rules retroactively for projects that entered its queue in reliance upon the process in place at the time of their application; thereby substantially undermining the investments made by those projects.

[1] Renewable Energy Coalition, Community Renewable Energy Association, the Northwest & Intermountain Power Producers Coalition, and the Oregon Solar Energy Industries Association.

In addition to broader market impacts of PAC's FERC queue reform, revisions to the state tariff must comply with state and federal statutory standards for QFs, including to "*encourage*" QFs. PAC's proposals will harm, not encourage.

Even if the PUC approves PAC's proposal and even with the revisions recommended by Staff, there will still be issues with PAC's interconnection process. Most notably:

- **PAC's Power Flow Study Assumptions are Flawed** – PAC's proposal does not propose any solution to its flawed power flow study assumptions. This glaring, bed-rock issue is particularly important to resolve before new studies proceed by PAC, given the eminent elimination of queue positions based the transition cluster study results. The cost and viability of all those longstanding queue positions will hinge fundamentally on the underlying study methodology used.

  PAC–inconsistent with industry norms–*excludes* its own load queue, *excludes* Bonneville Power Administration's (BPA's) load queue, and fails to allow its models to flow onto major adjoining systems, such as BPA.[2] The result is unnecessarily triggering major ($200 MM, 10-year scale) upgrades and unviable economics and schedules – incorrectly.[3]

  Evidence for the scale of this problem was shown in the Community Renewable Energy Industry Association's (CREA's) study on PAC's Central Oregon system where a study by ZGlobal Power Engineering & Energy Solutions showed that "up to 2070 MW could be injected into this area of the PAC system based on updating [PAC's] study methodology results to use industry-typical approaches. This level of generation additions can be made with little or no network upgrades."[4] This is in contrast to PAC's conclusions for a specific 2017 project study in the area which triggered over $200,000,000 in network upgrade costs for a 40 MW QF.[5] PAC admits that its imbalance between load and generation is one of the key reasons for its revisions,[6] and despite telling FERC that it was willing to hold a stakeholder process to address the power flow issues, it has thus far refused to do so.

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2 Attachment A *PacifiCorp*, FERC Docket No. ER20-924, Motion to Reject Tariff Filing and For Technical Conference and Settlement Meeting and Protest of the Community Renewable Energy Association at Attachment, ZGlobal PacifiCorp Central Oregon Area Generation Interconnection Feasibility Analysis CREA Report (April 10, 2020).

3 *Id.*

4 *Id.*

5 *Id.* Notably, at that same time, load was increasing in the area with a lack of transmission capacity to serve that load. Mike Rogoway, *Prineville is Running Out of Electricity, Jeopardizing New Manufacturing Jobs*, The Oregonian (Jan. 26, 2017) available at https://www.oregonlive.com/silicon-forest/2017/01/prineville_is_running_out_of_e.html ("The problem is that the BPA and Pacific Power lack the transmission capacity to meet industrial demand in Prineville - and, somehow, data center construction went on without anyone realizing this."). PAC built a transmission line to include in rate-base and serve this load. However, it seems like the better outcome could have been to study how then new generation could serve those loads rather than building and rate-basing a new transmission line, as such this study approach raises red flags and should be investigated.

6 PacifiCorp Reply Comments at 8.

Recommendation: The PUC should and must require PAC to hold such a process and address these concerns prior to November 1, 2020 when it will be kicking off its transition cluster study, to ensure that the cluster study will not produce inaccurate results. These are discrete, high-level primary study input/assumptions issues that can be address directly.

- **Study Delays are Still Likely Due to Withdrawals and Re-Studies** – PAC's proposal promises a set schedule for annual cluster studies and imposes additional restrictions and penalties on interconnection customers with the hope that those additional restrictions will result in fewer withdrawals and re-studies and fewer delays. Yet even though PAC admits that re-studies are "likely" and that it "appreciates the concern that cascading restudies could delay the conclusion of Cluster Studies,"[7] PAC has not engaged in a productive discussion about what alternative processes could look like.

  Consider a cluster study where some interconnection customers conclude that their allocation of network costs makes their project infeasible but other customers can move forward. The ones that determined the project is not feasible withdraw triggering a re-study and resulting in either: 1) lower overall costs because fewer upgrades are triggered and spread over fewer customers; or 2) the same overall costs resulting in increased costs to each customer. Under the first scenario, each project's allocation could increase (or decrease), meaning that more projects could withdraw resulting in further re-studies. Under the second scenario, the increased costs could also result in further withdrawals and more re-studies. Under any scenario, each customer would have to make the decision of whether to stay and post 100% of its network upgrade costs or withdraw and pay withdrawal penalties without knowing what others in the cluster will do. Further, it is not clear whether PacifiCorp's cluster study reports will be sufficiently detailed enough to inform interconnection customers of the thresholds at which various upgrades are required.

  However, a better process could provide customers with more information and more flexibility, especially given the high cost of getting it wrong in the form of posting network upgrade costs or incurring penalties. For example, as suggested in the Comments submitted by Oregon Solar Energy Industries Association (OSEIA) and NewSun on July 17, 2020, PacifiCorp could commit to providing more information in its initial Cluster Study to help inform customer decisions, a more expedited re-study process, or a process that allows for withdrawals to be submitted and re-studies before the requirement to post network upgrades. PacifiCorp's QRP simply does not allow for these types of creative solutions.[8]

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7 *Id.* at 6, 43.

8 And, even though PAC indicated a willingness in workshops to work through alternative solutions, when Jake Stephens of NewSun reached out to PAC to discuss more creative solutions, he was met with a request that communications be sent to PAC's counsel, rather than a constructive proposal (from either PAC employees or counsel) to discuss solutions.

Recommendation: The PUC should require that PAC engage with Stakeholders to develop more workable and creative solutions to avoid continuing issues around withdrawals and re-studies, and thus delay in the interconnection process.

Other issues, generally and as relates development backdrop: Further, in evaluating PAC's proposal, the PUC should consider the overall context and how each aspect of project development progresses and interacts with interconnection study processes. These include obtaining site control, land use permits, interconnection, and power contracting (among others). Each of these processes are generally moving and evolving in parallel and rarely occur in sequential order because they all impact each other. For example, consider a site control related example, re: how siting may reasonably evolve during a project's development: While some initial site control may be acquired, the permitting and diligence process may show limitations on a certain portion of the land such as a wetland, or costs avoidable by changing project footprint. The developer might then renegotiate with the land owner, or a neighbor, a revised overall site to avoid disturbing the wetland.

Similarly, where the interconnection process shows that a certain point of interconnection or configuration is prohibitively expensive, but other more viable options exist, the developer could similarly make changes to its site control to accommodate a more viable interconnection arrangement, or choose to abandon and avoid prohibitive site control expenses; but the developer needs *reliable* interconnection study information to make such decisions *which the interconnection study process is designed to facilitate*. Siting strategy for developments may evolve over time and the interconnection study process is only one part of facility development, and a critical input needed by a developer to make other risk and investment decisions; a final, full-scale and complete unchangeable site (nor utility discretion around that) is not an appropriate requirement to impose on vetting final interconnection costs. (A developer might also downsize its interconnection request—which current rules allow, but the new tariff radically changes, eliminating an important tool.)

In this context, PAC's site control requirements are problematic. PAC proposes to require site control of a sufficient size to support an entire project. Requiring such site control significantly limits a project's ability to site projects on Federal land because it will require the project to go through an extensive review process likely including an environmental impact assessment under the National Environmental Protection Act, a process which can take years and significant sums of money, all before it can get a position in the interconnection queue and an estimate of the projected interconnection costs. Even if the developer works with PAC on the front end to determine that it is a good site with sufficient interconnection capacity, by the time the site control is acquired for Federal lands, that interconnection capacity could be used up by other projects. PAC has not addressed this fundamental dichotomy between how projects are developed (i.e., with multiple fronts moving in parallel), and the requirements in the proposal. The proposal makes it virtually if not entirely impossible to develop on Federal lands.

Recommendations:

(1) PAC's site control requirements should be revised to not require such stringent site control requirements at either the initial application or at the Facilities Study stage and provide opportunities to keep a queue position while awaiting site control approvals beyond the customer's control. As such, we suggest the maximum requirement would be

documentation of "site control for land expected by interconnection customer to provide approximately [25%] of that needed for facility footprint."

(2) Downsizing rights—after cluster study and facilities study results—commensurate with prior tariff rights—must be required by the OPUC. Elimination of these rights substantively worsens the interconnection study process, and unnecessarily removes a basic, critical, valuable tool.

Finally, in comments submitted July 17 jointly with OSEIA, NewSun suggested numerous additional revisions to the PAC queue reform which, if adopted would greatly improve the process. NewSun continues to recommend those changes summarized in the table attached to those comments.

In conclusion, NewSun would like to reassert that interconnection customers will be harmed by PAC's proposal. QFs will be discouraged.

The changes are significant and consequential with impacts to the substantial investments interconnection customers make in Oregon and in reliance on the stability of the processes within which they must operate. They create specific and overall outcomes that PAC has not proven to be superior to the current tariff.

As stated previously, there simply has not been sufficient time to address these issues and work through constructive and workable solutions. We look forward to continuing the discussion on these important topics—and working together to craft, to the maximum extent possible, as quickly as reasonably possible, solutions to the issues raised.

We request additional process, workshops, and negotiations to satisfactorily resolve these issues—prior to PAC's performance of the initial transition cluster study (the start date of which is arbitrary and, relative to consequences of OATT reform to Oregon market and QFs, must be pushed back if needed, to ensure an outcome conducive to Oregon energy investment and compliant with applicable statutory standards.

Respectfully Submitted,

NewSun Energy LLC

s/ Marie P. Barlow

Marie P. Barlow
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Attachment A

Version 5.0

PacifiCorp Central Oregon Area

Generation Interconnection

Feasibility Analysis

CREA REPORT

v.April 10, 2020

Contents

Version 5.0

Introduction

Executive Summary

Community Renewable Energy Association (CREA) members and others have submitted multiple interconnection requests to PacifiCorp ("PAC") for generation additions in Central Oregon, on or near the PAC YYYYY (115 KV) & ZZZZZ (230 KV) substation facilities where PAC takes power service from Bonneville Power Administration's ("BPA") YYYYY substation (500/230/115) where BPA interconnects to the triple-500 KV AC-Intertie powerlines (aka the California-Oregon Intertie, or "COI"). CREA also requested evaluation of the total amount of power which might be injectable by additional generation on the PAC 115 KV and PAC's new 230 KV system in the area.

In short: Up to 2070 MW of additional generation could be added to PACs system by PAC utilizing industry-typical power flow modeling methods, not excluding loads in the area and preventing their model from studying power flow onto the consider adjoining transmission systems (which also serve their load). Further, these 2070 MW are based on existing facility ratings, meaning that few if any network upgrades are needed to support this level of generation additions.

This additional 2 GW+ is in stark contrast to prior Pacificorp interconnection studies, such as Qxxx, which triggered over $200,000,000 in network upgrades for a 40 MW QF seeking interconnection as studied in 2017, as PAC stated its "next closest load-surplus area is in the Yakima, Washington area" and required a 200-mile multi-state power-line built to interconnect that Qxxx. Those results would reasonably be expected to be different based on study variations considered here, including the load queue then, power flows onto BPA, as well as the additional [1000 MW] of loads since 2017.

PAC Sub-System Overview: PAC's service area territory in the central OR area is a small, geographically compact, and isolated sub-system area of PAC transmission ownership, serving the Bend/Redmond/XXXXX PAC service territory pocket, which load is primarily serviced by BPA, given PAC's lack of connectivity to other systems and minimal other generation in the area. PAC has also recently constructed new 230 KV facilities, being built to, per PAC's public presentations, provide additional load service and reliability for the increased data center load being constructed in the XXXXX area, with the supporting two 230 KV circuits (looping just the XXXXX area) and the now-operational 2019 Ochoco 230 KV substation (at a total cost of $55-60 MM).

Several contemplated new generation projects are in the PAC GI Queue for the cental OR are on its 34.5, 115, and (new) 230 KV system, totaling 1638 MW, some under state-, some under FERC-, jurisdictional GIRs. These projects can sell power as QFs, to serve existing 434 MW served by PacifiCorp via the BPA 230/500 kV YYYYY Substation, as well as the 1000 MW of Load Requests in the PAC unpublished load queue (which PAC excludes from its current GI study assumptions), along with BPA's 495 MW of queued load in the area (also excluded from PAC studies). The subsequent report provides an assessment of the local transmission system and its capacity to support the interconnection of additional generation and load under various scenarios, in particular if PAC adopted normal industry approaches and studied power flow to adjoining systems and all existing and planned loads.

The following table summarizes the results of the analysis. Two key observation can be made from these results. First is the significant difference between Case 1 and Case 2. Limiting the generation additions such that power does not back flow to the BPA system, as we understand PAC's study guidelines suggest, significantly limits the new generation that can be accommodated on the PAC system downstream of the BPA 500 kV system. This type of situation is most often, for example in the CAISO, NVE, or APS areas, be addressed via an Affected Systems assessment. For example, in the CAISO study process when results indicate an impact to a neighboring system, the CAISO will notify the impacted neighbor and work collaboratively with the interconnection customer to assess any additional system impacts, on the neighboring system, that may require mitigation. This is very common practice given the integrated transmission system of the WECC.

Second, without acknowledgment and inclusion of proposed load, such as larger data centers, PAC study results will continue to result in significant restrictions on the amount of generation that can be added. This is a critical coordination issue that PAC could address by including "sensitivities" for load additions in their system impact study process. For example, the queued load addition of 170 MW at YYYYY 230 kV, if included along with 170 MW of generation at that location would have essentially a "net zero" impact on the interconnected transmission system.

	Reference Scenario PAC study approach No Flows->Adjoining No Load Considered	**Scenario 1 – Allow Flow to BPA/Adjoining**	**Scenario 2 Adjoining Systems + BPA Load**	**Scenario 3 Adjoining + BPA Load + PAC load*** **
115 KV System	0	408	413	[+1000]
230 KV	0	580-1020	600-1070	[+1000]
		408 - 1020	413 - 1070	+1000

* Assumes entire gen queue comes online, even though PAC show some of those triggering upgrades. These MW would also then become viable if still in queue.

** BPA also studied and provide that 600 MW could be interconnected at the same BPA 230 KV substation PAC takes service at after prior Pacificorp studies, which this study assumes will be online as well.

*** Depends on voltage where load is connected, but roughly 1:1 ratio for 1000 MW for load queue. PAC has indicated in scoping meetings that their load queue is full to within 5 MW of the [1143] MW BPA studied import capacity to serve load,which is all based on BPA.

In summary, up to 2070_MW could be injected into this area of the PAC system based on updating their study methodology results to use industry-typical approaches. This level of generation additions can be made with little or no network upgrades.

Analysis

The transmission system serving this Central Oregon study area originates from the BPA YYYYY 500/230/115 KV substation, taking 115 KV service (via PAC' 115 KV YYYYY sub) and 230 KV service (via PAC's new ZZZZZ 230 KV sub), from the BPA-operated AC Intertie (COI), and also includes a 230 kV

connection to BPA at the BPA's Redmond 230/115 kV substation, and at BPA's 230/115 Pilot Butte substation.

The subsequent analysis of this system included two loading limitation conditions under two different "load scenarios" (with and without [BPA load queue]), then each Load Scenario, under two cases, with and without allowing for power flows from PAC system onto adjoining systems (eg BPA's system), to examine the impact of PAC's modeling restrictions upon total injectable generation on the local system.

- Scenario 1 – All Gen Queue w/ GIAs Comes Online, but No BPA Load Modeled: The first scenario considered all existing and queued generation that was shown to have an executed Interconnection Agreement and existing demand as reflected in PacifiCorp 2020 Summer Basecase.
- Scenario 2 – All Gen Queue w/ GIAs, Plus 495 MW BPA Load Queue The second scenario built off the first but included the addition of proposed load interconnections reflected in the BPA interconnection queue.

Each of the two loading limitations Scenarios then included two cases: *Case 1*, where generation additions were limited when energy was found to flow back onto the BPA 500 kV system and *Case 2*, when generation additions resulted in a normal or emergency limit violation regardless of flowback into BPA.

Scenario 1 results (no BPA Load): Under Scenario 1, applying the case 1 flow limitation, it was found that no new generation can be added to the 115 kV or 230 kV system, without the simultaneous addition of more demand otherwise power flow back into BPA was exacerbated.

115 KV System, Case 2: Under case 2 for 115 KV GIRs, with allowing energy to flow back onto the BPA system, it was found that a total maximum of:

- **408 MW** can be added, under normal loading conditions.
- **259 MW** can be added, to protect against N-1 contingency overloading
- **RAS**: Review of prior PacifiCorp System Impact Studies found reference to the use of Remedial Action Scheme (RAS) which provide for tripping generation offline in the event of a critical outage. Consequently, it is reasonable to assume a higher capacity (i.e. 408 MW) for generation additions to the 115 kV assuming a RAS is utilized.

230 KV system: Similarly, under Case 2, it was found that the 230 KV system can accommodate a maximum of:

- **1,020 MW** under normal conditions, and
- **580 MW** under N-1 contingency conditions.

Again, based on prior mitigations from PacifiCorp studies, use of a RAS will enable the higher level of generation to be added.

Scenario 2 results (w/ BPA Load)*:* Under Scenario 2, where proposed *demand* shown in the BPA interconnection queue is included more generation could be accommodated.

115 KV System, under Case 1 (no power overflows to BPA), a total of:

- **363 MW** can be added under normal conditions; and
- **388 MW** under emergency (N-1) conditions to the 115 kV system.

Under Case 2 (BPA overflow allowed),

- **413 MW** and **259 MW** respectively for normal and emergency limits can be added to the 115 kV system.

230 KV system:

Case 1 (no overflow to BPA)

- **330 MW** can be added under both normal and emergency conditions.
- **(same)** for the N-0 and N-1 results, due to the critical outage being one of the two parallel ZZZZZ-YYYYY 230 kV lines.

Case 2 (BPA overflows allow),

- **1,070 MW** normal operations, and
- **600 MW** for emergency limits.

Summarizing:

The imposition of a flowback limit (case 1) significantly limits the amount of new generation that can be added to the XXXXX area. Assuming the deployment of a RAS to protect against N-1 conditions and applying limitations based on actual system capacity (case 2) this assessment finds that 408 MW can be added to the 115 kV system or 1,020 MW to the 230 kV system under existing 2020 load assumptions (scenario 1).

Assuming the addition of load, incremental 120 MW at YYYYY 115 kV, 170 MW at YYYYY 230 kv, and 205 MW at La Pine, the total area load is approximately 840 MW (scenario 2). Under this scenario, and again assuming the use of a RAS, it was found that 413 MW of new generation can be added to the 115 kv system, or 1,070 MW to the 230 kV system.

Generation additions above these amounts are likely to trigger network upgrades. Generation that is co-located with load, within the PacifiCorp transmission area, can be added in amounts above those above but must be done in coordination with the addition of load so that increased line loading is effectively eliminated.

Project Area

Figure 1 – Central Oregon Area and Location of PacifiCorp Substations and Load Centers

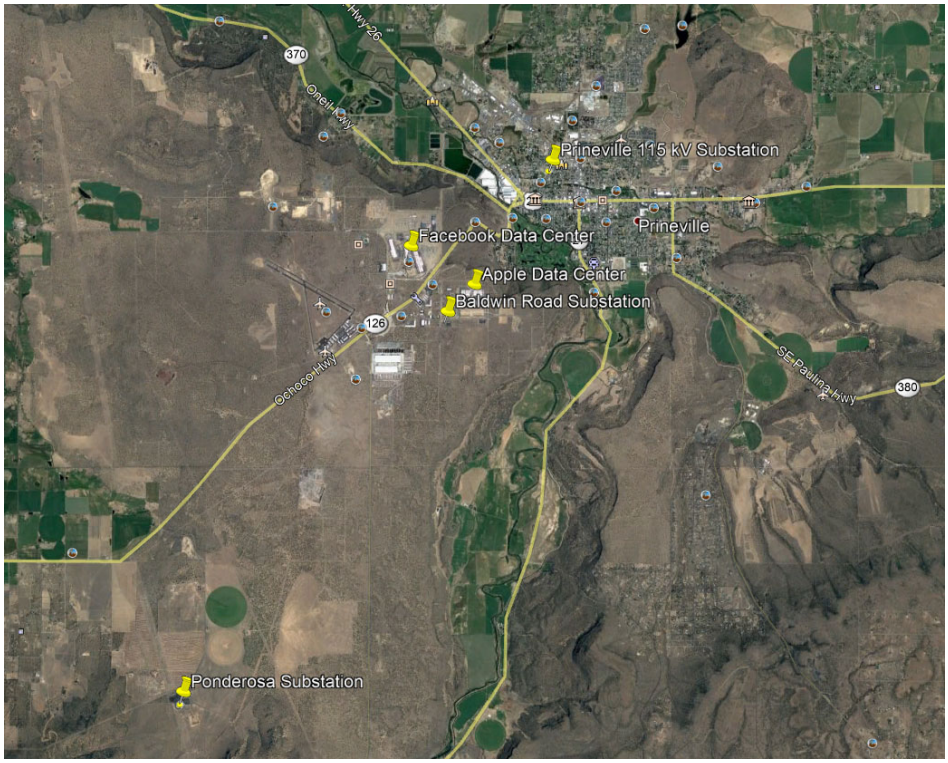

Figure 1A – Central Oregon Area (zoomed out) and Location of PacifiCorp Substations

Assumptions

PSLF Base Case

The WECC base case was provided by PacifiCorp to its interconnection customer. It is a heavy summer 2020 case in PTI PSS/E format. The basecase model was converted to a GE-PSLF compatible model for this analysis. The project site is in zone 474, under area 40. General Electric PSLF version 21.0_02 was used for this analysis. The following provides a high-level summary of the zone and area information for the model.

Basecase Summary Data for Study Area			
		Pnet (MW)	Qnet (MVAR)
Zone	474	1469	302
Area 40	Northwest		
	Bus #	Bus Name	MW
Swing Bus	40269	COULEE22	603
Pnet Schedule			4553

Table 1 – Basecase Zone and Area Summary Data

One Line Model

The figure below is a simplified diagram of the 115 kv and 230 kV transmission fed from the YYYYY 500 kV and serving the XXXXXXXXX 115 kV area. Detailed power flow single line flow diagrams are provided in Appendices.

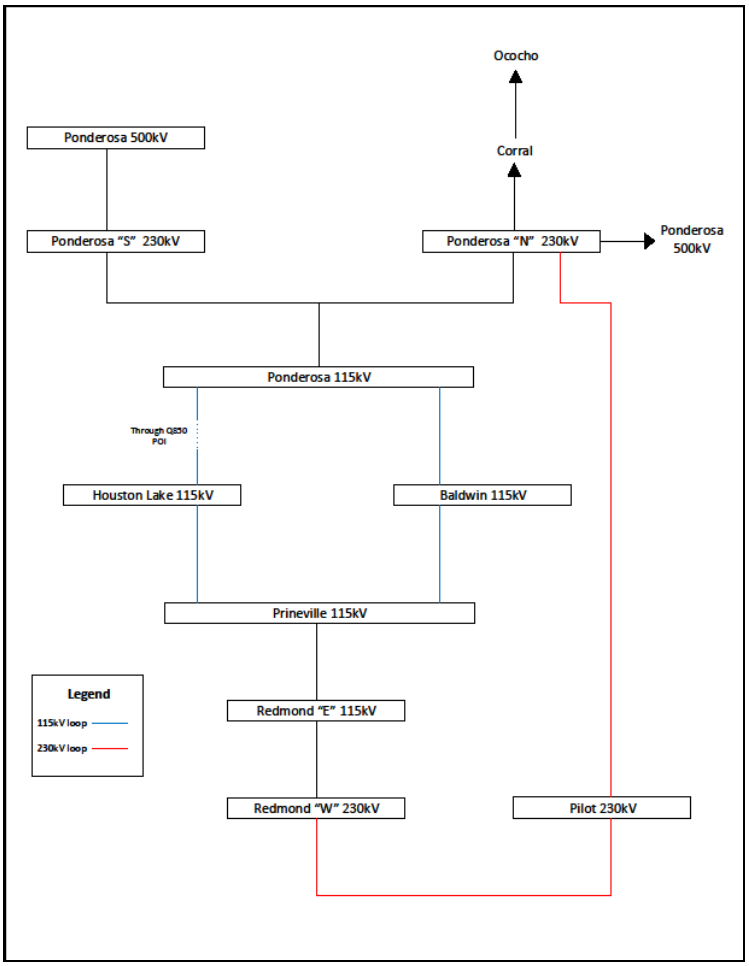

Figure 2 – Simplified Single Line Diagram of XXXXX Area Transmission

Generation Interconnection Queue

The following table provides the detailed PacifiCorp interconnection queue postings for prospective projects within the study area. These generators can be seen on the single line diagram, named J1 through J8.

REDACTED - 8 GI QUEUE POSITIONS FOR [1560 MW] OF SOLAR

Table 2 – Prospective PAC Generation Interconnection Queue Positions

Executed IA, Not in Service

In addition to the Prospective proposed generation, the following generation has been confirmed to be in the model or have been added. For this analysis, only projects with executed interconnection agreements have been assumed to be online and producing energy.

REDACTED SEVEN QUEUE POSITIONS FOR [322 MW] OF SOLAR

Table 3 – PacifiCorp Interconnection Queue Generation added to the study model

Load Interconnection Requests

Requests for new load interconnections within and near the study area are published in the BPA interconnection request queue. The following table shows the load interconnection requests in the BPA queue relevant to the study area.

Request Numbe	Request Date	Project Name	Requestor	Point Of Interconnection	Status	Connection Type	Requested In-Service Date	Agreed To: (Blank=TBD)	Max Outputs Summer	Winter
L0448	6/26/2018 17:00	Briones	PacifiCorp	PAC system downstream from BPA YYYYY Substation	STUDY	LL	6/01/2021	6/01/2021	120	120
L0422	11/09/2017 17:00	Project Vitesse 2	PacifiCorp	YYYYY 230kV Substataion	STUDY	LL	1/01/2020	1/01/2022		
L0415	5/30/2017 16:00	Project Vitesse	PacifiCorp	BPA's YYYYYY Substation	STUDY	LL	12/01/2019	12/31/2019	60	60
L0393	12/17/2015 10:00	Finley Butte Substation	Midstate Electric Cooperative, Inc.	LaPine 115kV Bus	STUDY	LL	10/01/2018	8/01/2021		
L0326	3/07/2011 14:46	YYYYY Substation	PAC	BPA YYYYY Substation	ENERGIZED	LL	10/01/2013	4/23/2013		
L0296	4/18/2008 11:00	Sunriver	Midstate Electric Cooperative, Inc.	BPA LaPine-Pilot Butte 230kV Line	STUDY COMPLETED	LL	9/01/2012	12/13/2020		
L0260	1/18/2007 16:49	Midstate LaPine Addition	Midstate Electric Cooperative, Inc.	LaPine Substation	ENERGIZED	LL	12/01/2008		163	163

Table 4 – BPA Load Interconnection Queue for Locations within Study Area

Note: The BPA queue listed one 300 MW load interconnection at YYYYY, submitted by PacifiCorp in 2018 which is shown as “Withdrawn”.

Additionally, PacifiCorp has indicated there may be as much as 1,100 MW of additional load interconnections that are not in the current queue (discussed as roughly [1,000 MW] above and elsewhere. A sensitivity shall be performed to assess the incremental generation that could be interconnected should some or all this load materialize. Generally, we’d expect a 1:1 ratio of absorption of this given the data center type loads assumed involved, compact area, and presence of load on 115 and 230 KV systems, which perhaps some variations depending on exact load and interconnection areas.

Existing/Queued Load and Generation

The following table provides a summary of the generation and loads reflected in the PacifiCorp model referenced above along with generation and loads identified in the *respective queues for both PacifiCorp and BPA.*

Bus Name and ID	Bus Voltage		Existing	Proposed Load	Description of any Proposed POI (Project Name)	Total Load		Existing	Proposed	Project	Total Gen
BALDWIN 44524	115 kV		24 MW			24 MW		22 MW 55 MW	59 MW 40 MW 80 MW	Client (J3) Client (J4) Client (J5)	256 MW
ZZZZZZ 44568	230 kV					None			600 MW	Client (J1)	600 MW
FRIEND_115 44565	115 kV		77 MW			77 MW					None
HOUSTNLK 44848	115 kV		77 MW			77 MW			59 MW	Client (J8)	59 MW
LAPINE 40633	115 kV		42 MW	42 MW ASSUMED 163 MW (TOTAL: 205 MW)	LaPine 115 kV (Finley Butte Substation) Midstate Electric Cooperative, Inc. (Midstate LaPine Addition)	247 MW					None
OCHOCO 44567	230 kV					None			600 MW	Client (J2)	600 MW
PILOTBT1 45441	69 kV	Load	14 MW 33 MW			47 MW	Generation	10 MW 10 MW 10 MW			30 MW
YYYYYY 40838/40836	230 kV			60 MW ASSUMED 60 MW 50 MW ASSUMED	YYYYYY 230 kV Substation (Project Vitesse 2) BPA's YYYYY Substation (Project Vitesse) BPA's YYYYY Substation (Ponderosa Substation)	170 MW					None
YYYYYY 45247	115 kV			120 MW	PAC system downstream from BPA Ponderosa (Briones)	120 MW		56 MW 35 MW	40 MW 80 MW	Client (J6) Client (J7)	211 MW
POWLBUPL 45253	115 kV		3 MW			3 MW					
XXXXXX 45255	115 kV		19 MW 20 MW			39 MW					None
Q850 POI 901 (BETWEEN PONDROSA-HOUSTNLK)	115 kV					None		61 MW			61 MW
RDMND_E 40873	115 kV		40 MW			40 MW					None
RDMND_W 40874	115 kV		31 MW			31 MW					None
RDMNDPPL 45263	115 kV		13 MW 14 MW			27 MW		1 MW			1 MW
REDMOND 41250	69 kV		18 MW			18 MW					None
YEW AV T 44958	115 kV		9 MW			9 MW					None

Table 5 – Load and Generation Summary for Busses Within Study Area

From table 5, there are two key load values of interest that directly influence the amount of generation that can be interconnected. The first is the total load within the 115 kV loop and the second is the load served from the 230 kV loop.

115 kV Loop including YYYYYY 115 kV				
Bus Name and ID	**Bus Voltage**	Existing (MW)	Proposed (MW)	Total (MW)
YYYYYY 45247	115 kV	0	120	120
BALDWIN 44524	115 kV	24	0	24
XXXXXX 45255	115 kV	39		39
HOUSTNLK 44848	115 kV	77	0	77
POWLBUPL 45253	115 kV	3		3
RDMND_E 40873	115 kV	40		40
RDMND_W 40874	115 kV	31		31
RDMNDPPL 45263	115 kV	27		27
REDMOND 41250	115 kV	18		18
YEW AV T 44958	115 kV	9		9
	Totals	**268**	**120**	**388**

Table 6 – XXXXX 115 kV Loop Load Summary – PAC LOAD

230 kV Loop including YYYYYY 230 kV and Lapine Area Load				
Bus Name and ID	**Bus Voltage**	Existing (MW)	Proposed (MW)	Total (MW)
YYYYYY 40838/40836	230 kV	0	170	170
QQQQQQ 44567	230 kV	0	0	0
ZZZZZZZ 44568	230 kV	0	0	0
FRIEND_115 44565	115 kV *	77	0	77
	Totals	**77**	**170**	**247**
* Friend 115 kV served from Ochoco				

Table 7 – YYYYY PPPPPPP 230 kV Loop Load Summary

Analysis Approach

The objective of the analysis is to determine the maximum allowable injection to the 115 kv loop between YYYYY and XXXXX substation such that under normal and N-1 conditions no equipment or facilities exceed the applicable line ratings. Generation projects listed above, as having an executed IA, will be assumed to be operational and be dispatched at full output.

Step 1: Assessment of 115 kv Line loading with existing and queued generation. Load as modeled in PacifiCorp Case.

Projects submitted by [PROSPECTIVE] (i.e. J3, 4, 5, 6, 7 and 8) will be dispatched at full load and modeled at the location indicated in the queue and one line model above. To the extend these projects to not cause overloads, additional MW's will be injected so that a maximum allowable value is determined for the 115 kV loop.

Step 2: Assessment of 230 kv Line loading with existing and queued generation. Load as modeled in PacifiCorp Case.

The two large projects submitted (J1 and J2) both at 600 MW will be modeled at the QQQQQ 230 kV bus as shown in the one line model above. The output for these projects will be adjusted to determine the maximum allowable project size to avoid overloads under N-0 and N-1 conditions. This step of the analysis will include the maximum dispatch determined in Step 1.

Step 3: Reassessment of Steps 1 and Steps 2 with addition of queued load

In this step, load additions proposed in the BPA queue for interconnection near or withing the XXXXX area will be added to the basecase. With these additions, the assessments done in Step 1 and 2 shall be re-run to determine the maximum allowable generation.

Sensitivity:

Additionally, sensitivity data related to load increases not reflected in the BPA or PacifiCorp queue, up to an additional 1,100 MW shall be performed. This sensitivity shall identify the incremental generation associated with incremental load increases.

Results

	Scenario 1	**Scenario 2**
115 kV Loop (YYYYY - Baldwin - XXXXX - Houston Lake) Incremental Generation Assumed to be at Baldwin Substation	Existing Generation and Load plus Queued Generation with IA	Scenario 1 plus Queued Load (120 MW on POND 115 kV, 170 MW on POND 230 kV, 205 MW on LAPINE 115kV)
Maximum Incremental Generation on 115 kV Loop (N-0)		

Case 1: No flow back onto BPA system across 500/230 kV transformers	System will already backflow into BPA without adding any generation.	5 MW in addition to J3-J8 (358+5=363MW)
Case 2: No normal overloads on BPA system or PacifiCorp System	50 MW in addition to J3-J8 (358+50=408 MW)	55 MW in addition to J3-J8 (358+55=413 MW)
Maximum Incremental Generation on 115 kV Loop (N-1): YYYY-BALDWIN 115kV goes out		
Case 1: No flow back onto BPA system across 500/230 kV transformers	System will already backflow into BPA without adding any generation.	30 MW in addition to J3-J8 (358+30=388 MW)
Case 2: No normal overloads on BPA system or PacifiCorp System	Can only keep J5, J6, J7, J8 (259 MW)	Can only keep J5, J6, J7, J8 (259 MW)
Maximum Incremental Generation at Ochoco 230 kV and ZZZZZ 230 kV (N-0)		
Case 1: No flow back onto BPA system across 500/230 kV transformers	System will already backflow into BPA without adding any generation.	330 MW from J1 OR J2
Case 2: No normal overloads on BPA system or PacifiCorp System	420 MW from J1 and 600 MW from J2 (1020 MW)	470 MW from J1 and 600 MW from J2 (1070 MW)
Maximum Incremental Generation at QQQQQ 230 kV and ZZZZZ 230 kV (N-1) (Either line ZZZZZ-YYYYYY 230kV goes out)		
Case 1: No flow back onto BPA system across 500/230 kV transformers	System will already backflow into BPA without adding any generation.	330 MW from either J1 OR J2
Case 2: No normal overloads on BPA system or PacifiCorp System	580 MW from either J1 or J2	600 MW from either J1 OR J2

Table 8 – Analysis Results

PAC Load Queue Sensitivity

As shown in the table above, including just BPA load addition requests of 495 MW, it was found that 1070 MW of new generation can be accommodated without triggering significant network upgrades to either PCA or BPA systems. This level of generation additions, 1070 MW, represents the generation that can be added assuming only existing PAC load of 434 MW as modeled in their 2020 base case.

PAC has indicated that there is on the order of 1,000 MW of new load requests in their “non-public” load interconnection queue. Local demand within the PAC system of central Oregon is a critical and significant driver with respect to the ability to add additional generation within the same transmission

area. For example, consider a proposed addition of a 200 MW data center to the 230 kV system, a proposed demand that would not be included by PAC in their system impact studies because it has not been interconnected as of the study date. Such a demand, if included in the study process, would allow the interconnection of 200 MW of new generation in the same electrical vicinity, for example connected to the same substation as the proposed demand, with a "net zero" impact to the transmission system.

Including a few basic premises: 1) relative proximity of load and generation, 2) inclusion of coordinated operating procedures and protection schemes, and inclusion of requested demand interconnections, such as the 1000 MW, the PAC system can support the interconnection of significantly higher levels of generation.

SUMMARY: In fact, under the study assumptions above, if an additional 1,000 MW of demand was added the PAC system could accommodate the addition of roughly 2,070 MW with minimum system impacts.

Appendix A – Power Flow Plots

[REDACTED]