

Setting the Record Straight on Energize Eastside's Technical Facts

From: Rich Lauckhart

To: city council and staff

Executive Summary

The most important aspect of any major transmission project is the underlying technical basis for the project. PSE's Energize Eastside project is a major transmission line that will have a tremendous impact on the entire Eastside. The fact that PSE wants to colocate this high voltage transmission line within a narrow corridor with the Olympic high pressure jet fuel pipelines means that the stakes are even higher.

A project like Energize Eastside should unequivocally have clearly demonstrated need, and the supporting documentation for the project, including PSE's load flow study as well as the EIS record, should be technically and reasonably sound.

I have performed an extensive study of both PSE's load flow study and the current EIS record, and my conclusion is that both fall short, the load flow study in particular. The Eastside cities involved are proceeding with a project that does not pass the bar of clearly demonstrated need and which in my professional opinion "violates the laws of the grid". PSE's claims simply do not add up. Furthermore, the current EIS record contains information that is not technically accurate.

This paper includes a detailed discussion of the following two points:

Assertion A: The current EIS record contains technically inaccurate information

Assertion B: Puget Sound Energy has never provided the actual data which would definitively demonstrate the need for Energize Eastside

Assertion A:

The current EIS record contains technically unsound information

Summary

As indicated in a number of places in the EIS record¹, Energize Eastside will provide no increased reliability benefit to the Eastside. When a utility is determining the need for a new transmission line, they perform a load flow study. This is present day industry standard. The load flow study serves as the primary basis for the decision of whether or not a transmission project is needed.

The assumptions used in the load flow study that PSE claims to have run would result in power outages in the entire Puget Sound Region whether or not Energize Eastside is built. A load flow study that is run with proper grid operation assumptions demonstrates there is no need for Energize Eastside to avoid outages on the Eastside. Therefore, under the “no action” alternative, **the EIS should conclude that a decision not to build Energize Eastside will not result in any more blackouts on the Eastside than if Energize Eastside were to be built. Yet this is not what the EIS record states.**

Background

The December 21, 2016 *Phase 2 Draft EIS – Scope of Analysis* includes a discussion of the “No Action” alternative. The following sentence is included in that discussion:

“If no action is taken, load shedding (forced power outages within the Eastside) would likely be needed during the highest demand periods in the near future.”

As pointed out in the rest of this report, there is no legitimate evidence on the record that this statement is true. In fact, the evidence in the record indicates that this statement is false.

Facts

The Eastside has had numerous power outages in the past and will continue to have power outages in the future. These outages are primarily caused by wind blowing trees and limbs into the local overhead 12 KV distribution lines. Energize Eastside will do nothing to decrease these outages in the future.

PSE claims that Energize Eastside will avoid outages on the Eastside under a scenario where:

- 1) Very cold weather (i.e. 23 degrees or lower) occurs on the Eastside during morning or evening peak load hours - an event that normally occurs only once every few years
- 2) At that same time, 1,500 MW is being delivered to Canada. This is a tremendous amount of power. However:
 - a. There is no firm requirement to deliver 1,500 MW to Canada under such an

¹ See (1) Lauckhart-Schiffmann load flow study dated February 28, 2016, (2) August 1, 2016 document referenced in 2a on bottom of page 2 and top of page 3 of this paper, and (3) May 31, 2016 document reference at 2 on page 4 of this paper.

event. [See comments filed to the EIS by Christina Aron-Sycz dated August 1, 2016 which includes a white paper entitled “Evidence that there is no requirement to deliver 1,500 MW to Canada on a Firm Basis-Resulting Conclusion is that Energize Eastside is not needed.”], and

- b. The entire Puget Sound Region would experience blackouts caused by insufficient voltage levels if 1,500 MW is delivered to Canada during such a cold weather event. *There simply isn’t enough power currently available that can be moved into the Puget Sound Region to serve all the load in the region (including serving all of PSE’s 1.1 million customers) during peak winter load conditions and to send 1500 MW of power to Canada. Building a new transmission line (Energize Eastside) does not bring more power into the Puget Sound Region.*
- 3) According to PSE’s needs assessment, at the same time as the above (very cold weather, 1,500 MW being sent to Canada) PSE/Quanta’s Load Flow Study assumed that six of PSE’s Puget Sound Area generators would be shut down. This is something that PSE would never do during such a cold event. Here is why:
- a. Energize Eastside is a transmission line. Transmission lines need generation to have power to transmit. Without these six generators running, PSE would not be able to meet its own Total System Load and would be in violation of their duties.
 - b. The entire Puget Sound Region (including the service territory of PSE, Seattle City Light, Snohomish PUD, Tacoma City Light and other small utilities in the region, not just the Eastside) would experience blackouts caused by low system voltage if six Puget Sound Area generators are shut down during such a cold weather event even if 1,500 MW isn’t being sent to Canada.
- 4) Lastly, in addition to 1) cold weather, 2) 1,500 MW being sent to Canada, and 3) six generators being offline, PSE assumes two major 230/115 KV transformers would be out of service. This is a preposterous scenario. *Since all these other things cannot happen at the same time without there being blackouts throughout PSE’s entire service territory caused by too low of voltage. This scenario makes no sense.*

The most important thing for you to know is that the PSE scenario (described above) is a hypothetical scenario that will never occur because system operators would not allow it to happen. If system operators allowed the system to operate in the manner that PSE postulates it used in its load flow study, the Puget Sound region in total would experience blackouts caused by low voltage. The above facts refute PSEs statement that Energize Eastside will increase the reliability of power supply to the Eastside.

Both myself and CENSE.org entered a number of documents into the EIS record that provide evidence that Energize Eastside will not reduce the number of outages on the Eastside. These documents include:

- 1) The Lauckhart-Schiffman Load Flow Study and the report associated with that load flow study. The report is titled “*Load Flow Modeling for Energize Eastside*”. It is dated

February 18, 2016.

- a. While PSE and Stantec have criticized the Lauckhart-Schiffman load flow study, these criticisms have been fully rebutted. [See attachment in email from myself to EnergizeEastsideEIS dated April 29, 2016]
 - b. In the April 29, 2016 document referenced above, I asked PSE, Stantec (the outside consulted PSE hired to perform their load flow study) and the EIS staff to provide documentation to support their attempt to discredit my load flow study. To this date neither PSE, Stantec, nor the EIS staff have produced such documentation. All indications are that such supporting documentation does not exist and that my load flow study is fully credible.
- 2) A document submitted by Christina Aron-Sycz on May 31, 2016 entitled “*Environmental Impacts if Energize Eastside (EE) is not built (i.e. “No Action” on EE)*”. This document provides a thorough analysis of the actions that would be taken if grid system operators attempted to run the system the way that PSE claims as the basis for Energize Eastside (peak demand on a very cold winter day, 1,500 MW being sent to Canada, six local generators offline, and failure of two transformers). My document fully explains that system operators would not allow the system to be run the way PSE postulates it would need to be run in order for Energize Eastside to have reliability value. **That document makes it clear that Energize Eastside provides no measurable reliability benefit to the Eastside and that blackouts will not occur if Energize Eastside is not built.**

Conclusion

The scenario that PSE claims as the basis for Energize Eastside could never happen because it violates the “laws of grid operation”. Therefore PSE has no legitimate claim to build an eighteen mile, 230 kV transmission line through the heart of your communities. PSE claims that this high voltage power line is needed to increase the electrical reliability of the Eastside. These claims are false because the basis used to justify its need is impossible. The Lauckhart-Schiffman Load Flow Study (which uses PSE’s own Base Case data set for heavy winter loading in the winter of 2017-18) demonstrates that Energize Eastside will provide no measurable reliability benefit to the Eastside. **Therefore, the No Action alternative will not result in any blackouts caused by load shedding on the Eastside or elsewhere on the grid and the December 21, 2016 statement by EIS staff is incorrect.**

Assertion B:

Puget Sound Energy has never provided the actual data which would definitively demonstrate the need for Energize Eastside

Summary

Power companies are required by the federal government to be able to provide continuous electricity even in stressed conditions. However, as soon as I read PSE's basis for the need for Energize Eastside (as described below), I realized that something was amiss. PSE is not required by any federal, state or local authority to build their grid to this level of preparedness. Meeting federal criteria is essential. The scenario above can only be described as a "doomsday" scenario. Allowing a power company to build their grid to meet a "doomsday" scenario results in investing hundreds of millions of dollars in a red herring project and needlessly subjecting communities to significant negative environmental impacts.

Background

Utilities demonstrate the need for transmission lines using a "load flow study." This is a computer simulation of how the complex electrical grid operates under various scenarios. PSE has in-house experts that normally perform these studies.

However, in 2013, PSE took the unusual step of hiring an outside consultant, Quanta, to perform a load flow study to prove the need for Energize Eastside. In my entire career at Puget Power (PSE's predecessor), load flow studies performed to assure our own system was reliable were never outsourced.

PSE/Quanta's basis for the need for Energize Eastside

Quanta concluded that PSE's equipment might overload under a combination of four extraordinary conditions:

- peak usage time on a very cold winter day (23 degrees or lower)
- simultaneous failure of two transformers
- at the same time, a huge amount of electricity is being transmitted to Canada (1500 MW)
- and six local generation plants are shut down, even though they were built for the specific purpose of providing power at peak load times (I oversaw the acquisition and building of these plants).

I decided to dig deeper into Quanta's load flow study to view it from all angles. I have overseen dozens of load flow studies on this exact same grid. To understand how the area's grid operates under this very unlikely scenario, I asked to see Quanta's load flow study. PSE declined multiple requests, each time citing reasons that were essentially baseless.

PSE's refusal to show their only load flow study did not deter me but rather compelled me even more to continue my research.

In December 2015, I performed my own load flow study with another transmission expert, Roger Schiffman. We were able to use the same software and same base case data that PSE's consultant had. **Our results show that the consultant's modified base case scenario violates fundamental limitations of the Northwest power grid and could lead to widespread power outages.** Most importantly, our study concludes that building eighteen miles of 230 kV lines through the heart of the Eastside (Energize Eastside) is not a necessary component to provide power to the Eastside and will not improve reliability in any measureable way. Furthermore, Energize Eastside will do nothing to prevent the most common type of blackouts - trees and limbs causing problems with the distribution system.

This remainder of this paper explains why it is important for a truly independent expert to verify the details of this important study, and how other factors lead to the conclusion that Energize Eastside is not necessary to serve the Eastside's energy needs.

Load flow models and the Pacific Northwest Grid

Transmission planning is accomplished by running load flow models². The terms "load flow study" and "load flow model" are interchangeable. PSE has stated that "The computer model used for system planning is one that is used throughout western North America."³ The system planning computer model needs a very large amount of data on the entire interconnected electrical grid.

PSE's transmission lines are an integral part of the entire electrical grid in the Western Electricity Coordinating Council (WECC) Region. The WECC Region extends from Canada to Mexico and includes the provinces of Alberta and British Columbia, the northern portion of Baja California, Mexico, and all or portions of the 14 states between. In order for utilities to get the needed data to run these load flow models, the WECC collects the needed data from each of the utilities in the region and compiles a database that can be used to study the grid. The Federal Energy Regulatory Commission (FERC) requires that every utility develop Base Cases to show how the system will operate in the future so that third parties can review and modify these Base Cases if they believe modifications should be made. In the WECC region, the WECC creates these Base Cases and files these Base Cases with FERC. PSE files these same Base Cases (the WECC Base Cases) with FERC in order to comply with FERC's requirement that every utility file Base Cases with FERC. I asked for and received the PSE Base Cases and Lauckhart-Schiffman used these Base Cases in their analysis.

² Load Flow analysis and Power Flow analysis are two different ways of referring to the same analytic process. The load flow model itself is a mathematical simulation of all the components of the interconnected electric system that provides flows and other physical conditions on each of the elements of the interconnected transmission grid.

³ http://www.energizeeastsideeis.org/uploads/4/7/3/1/47314045/phase_1_draft_eis_scoping_report.pdf at page 15.

PSE's Needs Assessment

The Eastside Needs Assessment report prepared by PSE and Quanta was based on a load flow study which looked at the reliability of the transmission grid on the Eastside under heavy loading conditions in the winter of 2017-18. The load flow study was conducted by Quanta, a consulting firm headquartered in North Carolina.

CEII learance granted to me by the Federal Government

In July of 2015 I applied for and was granted CEII [Critical Energy Infrastructure Information] clearance from FERC. After that I asked FERC to allow Roger Schiffman and Don Marsh to be included in my CEII clearance. FERC approved my requests. CEII clearance gives us the authority to access and review the Load Flow Base Case data files that PSE files with FERC.

We submitted our CEII clearance letters to PSE and asked for access to the Quanta load flow study.

PSE refused to share Quanta's Load Flow study with both myself and Don Marsh which would have allowed us to perform an even deeper review of the need for the Energize Eastside project. PSE's refusal cited that we may use the data to find weaknesses in the grid which will allow us to perform terrorist outages on the grid. However, FERC's CEII clearance letter stated that neither Don Marsh nor myself are considered terrorists and FERC has also stated that we have a legitimate need to see the load flow data.

FERC has gone so far as to provide both myself and Don Marsh a number of sets of load flow data that include data on PSE's system and every other system in the WECC.

In the Macquarie/PSE/Quanta load flow study performed in the Eastside Needs Assessment, PSE/Quanta took the WECC Base Case and made modifications to it. We know this because when we ran our own study, everything checked out. Yet PSE claims their load flow study resulted in significant outages. This could only happen if PSE had Quanta make alterations to the Base Case data files that they filed with FERC.

PSE's claim that it will not provide its load flow study (and therefore its modifications to the WECC Base Case) because of terrorism concerns is patently baseless. FERC has already provided the information that I or Don Marsh would need to perform terrorist activities if we were so inclined, which we are obviously not. Furthermore, Don Marsh and I have signed agreements with FERC that we will not use the information granted for nefarious purposes.

As indicated below, I believe that the real reason that PSE has chosen not to provide its load flow study is that there is a high likelihood that PSE has artificially and inappropriately made modifications to the Base Case that are outside of the realm of acceptable behavior by a utility.

Critical problems with assumptions in the Quanta load flow study

PSE already had a Base Case filed with FERC for heavy loading conditions in the winter of 2017-18. But rather than using the parameters in that base case, Quanta made major adjustments to it. According to the Eastside Needs Assessment report, Quanta made at least two changes to the Base Case that are highly problematic:

- Quanta shut down 1,340 MW of generation located in the Puget Sound area (six generation plants) when, in the Base Case filed with FERC, all of these generators were running.
- Quanta increased the flow of power to Canada from 500 MW to 1,500 MW.

Then, in order to comply with reliability criteria that says the system should be able to survive the failure of up to two elements on the grid (N-2 or N-1-1), Quanta eliminated one 230/115 KV transformer at its Sammamish Transmission station and eliminated one 230/115 KV transformer at its Talbot Hill Transmission Station.

Further problems with the Quanta study

There are a number of other problems with the Quanta load flow studies as follows:

- Lack of accounting for needed power generation
 - Quanta said nothing about how PSE would source its total system generation need of 6,500 MW⁴ in heavy winter conditions in 2018 if it shut down nearly 1,400 MW of PSE generation resources (the six generation plants) in the Puget Sound region. PSE's Integrated Resource Plan (IRP) indicated that PSE does not have enough firm supply lined up to cover its 2018 needs even if all of the PSE resources in the Puget Sound Area were operating. The IRP indicates a PSE shortfall of 2,000 MW in 2018 even if all of its resources are operating. If another 1,340 MW is not operating during the peak (the six generation plants that Quanta assumes are offline), then that shortfall grows to a whopping 3,340 MW. A shortfall that is more than 50% of its total need. The Eastside Needs Assessment makes no mention of how Quanta thinks PSE would meet its peak generation need under this extreme shortage condition.
- Illegitimate changes to Canadian power flows
 - Quanta said nothing in the Eastside Needs Assessment about why it decided to increase the flows to Canada to 1,500 MW. In later statements, PSE has indicated that a 1,500 MW flow to Canada is required by the Columbia River Treaty. But that is patently false.
 - The Treaty was signed in the 1960's. The delivery of power to Canada as a result of this treaty were, according to the terms of the treaty, supposed

⁴ Includes required Planning Margin and Operating Margin

to be accomplished by Bonneville Power Administration building a new transmission line in eastern Washington north to the Canadian border near Oliver, BC, east of the Cascades. Also according to the treaty, BC Hydro was then supposed to build from their system in British Columbia to meet the new BPA line. Under that plan, there would be no impact on transmission in Western Washington and PSE ratepayers would not be financially responsible to fulfill the Columbia River Treaty, which, it being an international treaty, is the financial duty of the federal government (of which BPA is an entity). But for the first thirty years of the Columbia River Treaty, Canada chose not to receive the power but instead sold it on the firm power market to US entities.

- Then, in the 1990's as those thirty year sales agreements to US entities were about to expire, both parties (BPA and Canada) decided to see if they could continue to operate without building the twin transmission lines to Oliver (as originally intended in the treaty). To determine if this was possible, BPA ran load flow studies to determine if any issues would arise on the grid if the joint lines to Oliver were never built. BPA's Record of Decision (ROD) that resulted from those studies made a comparison of the "Oliver plan" with a plan that did not include building Transmission to Oliver. That ROD stated the following⁵:
 - In order for at least partial treaty deliveries to be made at Oliver (in accordance with the original treaty), the US would need to build "One new single-circuit 500 -kilovolt (kV) line from Grand Coulee or Chief Joseph Substations to the United States/Canada border near Oliver by 2003" and Canada would need to build "Border-to-Oliver: One new single-circuit 500-kV line and substation by 2003".
 - Alternatively, in order for full delivery of Canada's share of treaty power to be delivered to Blaine and Selkirk,
 - o "one cross-Cascades 500-kV transmission line would be accelerated 6 or 7 years under an Eastside generation scenario" and,
 - o "a second cross-Cascades line might also be accelerated."
- After completion of the ROD and an evaluation of these findings, the original treaty with Canada was modified to remove the US requirement to build to Oliver. Canada was allowed to continue to sell its share of treaty power in the United States on a short term basis. Canada retained the right to request that its share of treaty power be delivered to Canada on any hour at the Blaine and Selkirk points of delivery; however, if the

⁵ United States Entity US Department Of Energy, Bonneville Power Administration US Army Corps of Engineers, North Pacific Division Delivery of the Canadian Entitlement Final Environmental Impact Statement Record of Decision <https://www.bpa.gov/news/pubs/RecordsofDecision/rod-19961108-Delivery-of-the-Canadian-Entitlement-Final-Environmental-Impact-Statement.pdf> at page 8.

grid could not accommodate full delivery on any hour (e.g. because the new Cross Cascades lines had not been built), then it would not be delivered to Canada.⁶

- These new cross cascades line have not been built nor is there any written plan to do so in the future.
- Furthermore, Canada (through BC Hydro, Canada's power utility) has stated that it does not include its share of treaty power in the Load/Resource Balance in its IRP because the British Columbia Utilities Commission (BCUC) does not consider it a suitable source of dependable capacity.⁷ This means that Canada's internal power planning structure does not formally depend on any transfers of power from the US to Canada.

There is other evidence that there is no requirement to deliver 1,500 MW to Canada. See Attachment 1, which document was filed in the EIS comment period.

PSE's/Quanta's study defies the "laws of the grid"

Loads in the Puget Sound region (including PSE's loads) are served by generation located in the Puget Sound region as well as generation located east of the Cascades which are transmitted to the Puget Sound region on the eleven transmission lines that cross the Cascades. There is a limit on the amount of power that these eleven lines can carry west across the Cascades from eastern Washington to the Puget Sound area. There are mathematical limits to the number of megawatts of power that can be moving on these lines - the "laws of the grid", if you will. The load in the Puget Sound region is greatest in a cold winter scenario. The PSE Base Case load flow for heavy winter conditions in 2017-18 showed very high loading on the eleven cross-Cascades transmission lines, even with all the Puget Sound generation running and with only 500 MW flowing to Canada. In our load flow study, Lauckhart & Schiffman attempted to increase the flow to Canada in this Base Case from 500 MW to 1,500 MW. The computer model found an unacceptable problem on these eleven cross cascades lines. Then, Lauckhart & Schiffman left the flow to Canada at the 500 MW level reflected in PSE's Base Case, but then shut down the 1,340 MW of Puget Sound Area generation that Quanta mentions in the Eastside Needs Assessment. Again the computer model found an

⁶ COLUMBIA RIVER TREATY ENTITY AGREEMENT on ASPECTS OF THE DELIVERY OF THE CANADIAN ENTITLEMENT
For APRIL 1, 1998 THROUGH SEPTEMBER 15, 2024 BETWEEN THE CANADIAN ENTITY AND THE UNITED STATES ENTITY DATED MARCH 29, 1999 at paragraphs 8 & 9.
http://www.bcuc.com/Documents/Proceedings/2006/DOC_10966_B1-131_Columbia%20River%20Treaty%20Agree.pdf

⁷ See BC Hydro November 2013 IRP, Chapter 2 at page 2-20.
<http://www.bchydro.com/content/dam/BCHydro/customer-portal/documents/corporate/regulatory-planning-documents/integrated-resource-plans/current-plan/0002-nov-2013-irp-chap-2.pdf>

unacceptable problem on these eleven cross-Cascades lines. You can see how the computer model gets extremely problematic if both assumptions are changed at the same time. Under either of these scenarios, it is important to note that all of PSE's service territory would experience blackouts caused by low voltage, not just the Eastside. Despite numerous requests for explanation by myself and Don Marsh, PSE/Quanta have never said how they addressed these problem in their load flow analysis. The Bellevue city council claims they have requested an explanation of this from PSE, but I know of no response to this request or whether it was in fact actually requested.

PSE's stated "electrical criteria" used in their Eastside Needs Assessment

PSE has not provided the load flow study that Quanta ran that attempts to justify Energize Eastside. The Lauckhart-Schiffman load flow study report raises serious questions about how Quanta conducted its load flow study to prove the need for Energize Eastside. To try to understand why PSE's/Quanta's load flow study deviates from the WECC Base Case, one can look to the eleven "electrical criteria" listed in the Eastside Needs Assessment that PSE claims as their basis for this project. To the layperson, the electrical criteria laid out by PSE cites seem reasonable. However, to my experienced eye, these electrical criteria reveal that PSE/Quanta made unacceptable modifications to its study. Specifically, I believe that they failed to adhere to industry standards and are attempting to override the "laws of the grid". See Attachment 2.

By contrast, the Lauckhart-Schiffman load flow study does adhere to the "laws of the grid" and follows industry standards for studying the reliability of power service to the Eastside. The Lauckhart-Schiffman study demonstrates that Energize Eastside is not only not needed, it also shows evidence that the PSE/Quanta studies used to justified Energize Eastside defy the "laws of the grid".

PSE refuses to discuss these matters with me

I have made numerous attempts to reach out to PSE to discuss all of these matters in person or at least by phone. However, PSE has repeatedly stated that they are not available or not interested.

Despite contrary statements by PSE to the city staff, I harbor no ill will against PSE. It may be hard to believe in this day and age that an individual would devote as much time and energy as I have to studying this project without some kind of ulterior motive. I am a naturally intellectually curious individual and had I seen evidence at the outset that Energize Eastside was simply another important piece in the framework of the Eastside's grid, I would have moved on. However, my deep knowledge of Pacific Northwest transmission planning and my own conscience compel me to make the public, and especially the decision makers, aware of just how flawed this project is.

Conclusion

PSE has not provided the load flow study that it claims demonstrates the need for Energize Eastside. The Lauckhart-Schiffman load flow study, which is based on the heavy winter 2017-18 Base Case that PSE submitted to FERC, demonstrates that Energize Eastside is not only not needed but defies the “laws of the grid”. PSE has openly criticized the Lauckhart-Schiffman load flow study for running all the Puget Sound area generation and for not sending 1,500 MW to Canada. But as described in this paper, the Lauckhart-Schiffman assumptions on these matters are more defensible than the assumptions that Quanta used in its load flow analysis. In fact, it is highly unclear how Quanta was able to resolve the cross-Cascades power flow problems that would arise under their assumptions. It simply does not add up, and I compel you to not accept this project at its face value. Your communities are depending on you. I am more than willing to provide you with assistance, at no cost, to help study this further.

Attachment 1

White Paper

Evidence that there is no requirement to deliver 1,500 MW to Canada on a Firm Basis.... Resulting Conclusion is that EE is not needed

PSE attempts to justify the Energize Eastside line by stating that PSE is required to deliver 1,500 MW to Canada on a very cold winter day during the peak load hour at the same time that 1,400 MW of local generation is not running and two major transformers on the Eastside fail.

That there is no Firm Requirement to deliver 1,500 MW to Canada (e.g. under these extreme conditions) is evident from a number of standpoints as follows:

- 1) Any Firm Requirement to deliver 1,500 MW to Canada would be evidenced by the existence of a contract that shows such a requirement. No one has produced a contract that includes such a requirement. The EIS record includes a request that either PSE, or Stantec, or the Bellevue EIS staff produce such a contract. No such contract has been produced. We believe there is no such contract.
- 2) FERC has stated *“The record before us shows that the Energize Eastside Project is located completely within Puget Sound’s service territory, ... and that neither Puget Sound, nor any other eligible party, requested to have the project selected in the regional transmission plan for purposes of cost allocation; therefore, the project is not subject to the Order No. 1000 regional approval process.”* For these stated reasons, FERC does not consider the EE line to be a FERC jurisdictional line. Instead FERC calls it a line for local need. **From this FERC finding it is clear that 1,500 MW to Canada (a Regional flow matter) should not be reflected in the study of the need for EE because PSE never requested the EE line be selected in a regional transmission plan.**
- 3) There have been unsupported claims that the Columbia River Treaty requires PSE (or BPA or some unknown entity) to deliver 1,500 MW to Canada. However that is not true as evidenced by:
 - a. The treaty deliveries to Canada were by its terms supposed to be accomplished by BPA building a new transmission line in Eastern Washington north to the Canada border near Oliver, BC, east of the Cascades. BC Hydro was supposed to build from their system in British Columbia to meet the new BPA line. Under that plan, there would be no impact on transmission in Western Washington and PSE ratepayers would have paid nothing to cause the Columbia River Treaty benefits to be moved to Canada. But for the first thirty years of the Columbia River Treaty, Canada’s share of Treaty power was sold “Firm” for 30 years to US entities. In 1998 when those sales to US entities expired, the Treaty was amended to eliminate the requirement to build transmission to Oliver in exchange for giving Canada the right to sell its share of Treaty power in the future to US entities on a

short term basis.

- b. The 1998 amendment to the treaty stated that if Canada later decided it wanted its share of Treaty Power to be delivered “Firm” to Canada, then Canada needed to ask BPA to study to determine what work would need to be done on the transmission grid to make that happen. After that study, if Canada was willing to pay money for those transmission improvements, then the Treaty power would be delivered “Firm” to Canada. **Canada has never made such a request to have its share of Treaty power delivered to Canada on a Firm Basis as evidenced by BPAs response to a Public Record Act request to search the BPA Transmission Request Queue to locate any such request from Canada. BPA stated that it did not find any such request.**
 - c. BPA has known since at least 1998 (when the treaty was amended) that it would not be able to deliver Canada’s share of downstream benefits to Canada under all weather and contingency conditions. In 2009, Puget Sound Area Study Group members developed a draft report entitled “Assessment of Puget Sound Area/Northern Intertie Curtailment Risk.” That study describes certain system operating plans that could reduce the Curtailment Risk in the south-to-north direction on the tie to Canada.
- 4) On May 13, 2015 Mike Brennan was asked to have Peter Mackin of USE please provide the Firm Transmission Service that would be relevant for his load flow studies. In other words, please provide a copy of any and all contracts that Peter is aware of under which BPA has contracted to provide Firm Transmission Service in the northerly direction over this line. It has been over a year since this request was made and no response has been provided. We believe no response was provided because no such contract exists.
 - 5) Gary Swofford, 38 year Puget employee who recently retired as Chief Operating Officer of PSE VP of PSE, spoke to the Bellevue City Council on December 14, 2015 and stated that “nothing could be further from the truth” than a claim that Energize Eastside is being built to deliver 1,500 MW to Canada. He claims the need for Energize Eastside is simply an eastside load matter. However, apparently unknown to Mr. Swofford, neither the USE load flow study nor the Lauckhart-Schiffman study shows a need for Energize Eastside if 1,500 MW does not need to be delivered to Canada. PSE has never produced a load flow study that says otherwise.
 - 6) PSE claims that NERC/FERC reliability criteria require 1,500 MW to be delivered to Canada. The EIS record includes a request that either PSE, or Stantec, or the Bellevue EIS point to specific language in NERC/FERC reliability criteria that describes such a requirement. PSE generally refers to NERC/FERC Reliability Criteria TPL-001. But TPL-001 is a 20 page document and no one has pointed to specific language in TPL-001 that describes such a requirement. There is a reference in TPL-001 to Firm Commitments, but **no one has shown a contract under which a Firm Commitment to deliver 1,500 MW to Canada exists.**
 - 7) Any Firm Contract to deliver 1,500 MW to Canada would be subject to FERC jurisdiction. Any requirement under NERC/FERC Reliability Criteria would also be subject to FERC jurisdiction. If PSE believes that a denial of their permit to build EE would violate a Firm Contract to deliver 1,500 MW to Canada or would violate a NERC/FERC Reliability Criteria, then PSE should have requested that FERC make such a finding in CENSE’s Complaint at FERC. FERC made no such finding in their Order on CENSE’s complaint. In fact, to the contrary, FERC stated it had no

jurisdiction over the EE line.

- 8) The Western Electricity Coordinating Council (WECC) prepares the Base power flow cases for use by western North America power companies such as PSE to help them study the grid and its reliability. WECC prepared Base Case load flow studies for the heavy winter loading conditions for the winter of 2018. WECC ran all of the Puget Sound gas fired generation and transferred 500 MW of power to Canada in that case. The reason WECC did not transfer more power to Canada in its Base Case is that problems occur on the grid if that happens. WECC did not state that the case was not compliant with FERC reliability criteria because WECC did not see a Firm Commitment to deliver 1,500 MW to Canada.
- 9) The Lauckhart-Schiffman load flow study effort attempted to modify the WECC heavy winter load base case for the year 2018 by increasing the flow to Canada. When they attempted to do this, the load flow study could not find a solution to satisfactorily meet reliability criteria. This was true whether or not the Energize Eastside line was included in the load flow data set being used. Simply put, the loading on the eleven transmission lines crossing the Cascades from the Columbia River to Western Washington could not handle the loading that would be necessary to delivery 1,500 MW to Canada, whether or not the Energize Eastside line is built. And this is true even with all the Puget Sound Area gas fired generation is operating. Clearly it would take a major new transmission line crossing the Cascades (or a new line to Oliver from eastern Washington) for 1,500 MW to be delivered to Canada on a Firm Basis.
- 10) CENSE has made Herculean efforts to get PSE to divulge its load flow study showing a need for the line. PSE has created a series of excuses for not showing CENSE and its experts its studies. The experts retained by CENSE believe that the real reason that PSE has chosen not to provide its studies is that any such study that they might have is artificially/inappropriately made in some fashion.
- 11) PSE refuses to show its load flow studies to the experts retained by CENSE because they fear that those experts may use the data to find weaknesses in the grid which will allow them to perform terrorist outages on the grid. FERC has stated that the CENSE experts are not considered terrorists and FERC has stated that the CENSE experts have a legitimate need to see the load flow data. In fact, FERC has provided the CENSE experts a number of sets of load flow data that include data on PSE's system and every other system in the WECC. PSE's claim that it will not provide its modifications to the WECC load flow cases because PSE is concerned about terrorist activities rings untrue. FERC has already provided the information that CENSE's experts would need to perform terrorist activities if they were so inclined. Nothing PSE would provide would give any additional help. But CENSE's experts have signed agreements with FERC in which they promise not to use the data provided them for any nefarious purpose.

Bottom line:

- a) It is clear that there is no Firm Requirement to deliver 1,500 MW to Canada.
- b) It is clear that the grid cannot deliver 1,500 MW to Canada in an extreme cold situation with or without the Energize Eastside line.
- c) **It is clear from (a) the U.S.E. and (b) the Lauckhart-Schiffman load flow studies that Energize Eastside is not needed if 1,500 MW is not being delivered to Canada.**

Attachment 2

PSE “Electrical Criteria” hints at how Quanta ran the load flow model that PSE claims justifies EE “An inappropriate load flow study”

The Eastside Needs Assessment report prepared by PSE and Quanta states that PSE/Quanta ran a load flow study that concluded that EE is needed in order to reliably serve power to the Eastside. But PSE has refused to show the data from its load flow study. Lauckhart & Schiffman ran a load flow study that concluded that EE was not needed. Lauckhart-Schiffman load flow study was performed using the Base Case load flow study that PSE files with FERC. The Lauckhart-Schiffman load flow study report indicates that if NERC/FERC reliability standards are followed, EE is not needed. Further, the Lauckhart-Schiffman study questions how the PSE/Quanta load flow study could have been made to work given the problems with the loading on the eleven transmission lines that cross the Cascades to northwest Washington from the vicinity of the mid-Columbia River.

By looking at the 19 criteria listed In Chapter 2 of the Phase I Draft EIS, it is possible to make a reasonable guess of how PSE/Quanta ran its load flow study. Assuming this reasonable guess is correct, the PSE/Quanta load flow study that was used to justify EE is plainly inappropriate for this purpose.

The “reasonable guess” is made as follows:

a) PSE stated Criteria number 7: *“Adjust regional flows and generation to stress cases similar to annual transmission planning assessment.”* ColumbiaGrid had run a “stressed load flow case” **for information purposes** just to see how the system would respond if the Base Case was adjusted to significantly increase stresses on the system. Columbia Grid indicated that this stressed case caused significant adverse impacts on the system but there was no need to make any fixes to the system to address those problems as a result of this stressed case run because **the case exceeds the NERC Reliability Criteria.**⁸ *[Having a model of the system allows the user to look at any scenario they want. In this case, apparently some party wanted to look at a very stressed condition...so it was run. But the probability of those set of assumptions is excessively low. And neither FERC nor NERC nor ColumbiaGrid (nor any rational person) believe*

⁸ Ten-year extra heavy winter: 2017-18HW2 with loads increased to model five years of load growth plus approximately 12% addition to load represent an extra heavy (5% probability of occurrence) load for 2023, Boardman and Centralia #1 were removed, Centralia and Port Westward CTs were added as in the heavy summer case, transfers from California were increased to make up the difference in load and generation. **The Northwest to British Columbia transfer was increased to 1500 MW and the West of Cascades North transfer was increased to near its limit (10,200 MW) by reducing local west side gas generation. This case is being studied for information purposes and mitigation is not required as it goes beyond what is required in the NERC Reliability Standards.** [ColumbiaGrid 2013 System Assessment Pg 12]

that it makes sense to fix the system for this extremely low probability event. That is why ColumbiaGrid did not look to find fixes to the problems under this scenario. However, PSE has made this the main scenario for looking at the need for Energize Eastside - that makes no sense.]

b) As demonstrated by the Lauckhart-Schiffman report, the load flow model will not run under this scenario because of the problems that are created on the grid unless other changes to the data base are also made. From this same "PSE Criteria" document we can get some insight into how Quanta may have made the load flow model run.

c) PSE stated Criteria number 8: *"Take into account future transmission improvement projects that are expected to be in service during the study period."*

d) PSE stated Criteria number 2: The "Study Period" was from 2015-2024.

e) It appears that PSE thinks that sometime prior to 2025 someone will build one or two new Cross Cascade lines. But no one is announcing today they intend to build new Cross Cascade lines. PSE may speculate they will be built, but there is no compelling evidence they will be.

Bottom Line:

In a nutshell PSE/Quanta have decided to run a Load Flow study to determine the need for EE, which load flow study has major flaws.

- First it starts with a Scenario that has negligible probability of occurring
- A Scenario that vastly exceeds FERC/NERC reliability criteria.
- Then in order to make that Scenario work electrically, Quanta seems to have modeled new Cross Cascades transmission lines that no one is working on.
- And no one is working on them because any scenario that is consistent with FERC/NERC reliability criteria says the new Cross Cascades transmission lines are not needed.

This load flow study is completely inappropriate for studying the reliability of power service to the Eastside. The Lauckhart-Schiffman load flow study is the appropriate way for studying the reliability of power service to the Eastside. That study demonstrates that EE is not needed.