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January 7, 2020

Honorable Phil Olbrechts  
Renton Hearing Examiner

Re: Application of Puget Sound Energy for Conditional Use Permits for Four Miles of 230 kV Transmission Lines: Application LUA18-000055,CUP-H,SME

Dear Examiner Olbrechts:

I have been engaged by the Coalition of Eastside Neighbors for Sensible Energy (CENSE) to provide electrical analyses with regards to Puget Sound Energy's (PSE) Energize Eastside Project (EEP). EEP proposes to upgrade the existing double-circuit 115 kV line from the Talbot Hill substation to a new substation at Richards Creek to the Sammamish substation to 230 kV. Approximately four miles of the Talbot Hill to Richards Creek line would be located in the City of Renton.

PSE has stated that the need for EEP is based on the reliability impacts on the electric system, primarily the overloading of the existing electric facilities at Talbot Hill and Sammamish substations. PSE has supported this contention with a number of studies, including: a 2013 needs assessment (by PSE and Quanta), 2014 solutions report (by PSE and Quanta), and an outage cost study (by Nexant). The first two studies point to thermal overloads on the existing 115 kV Sammamish-Lakeside-Talbot Hill line as indicative of a reliability need, with the 2014 report proposing the upgrade of the affected lines to 230 kV. This was determined through a form of assessment known as "power flow analysis." The third study uses the results of the previous two studies to develop a cost estimate for customer outages if the reliability needs were not addressed.

My engagement involves confirming PSE's analysis using updated power flow models of the electrical system obtained via Critical Energy Infrastructure Information request with the Federal Energy Regulatory Commission (FERC). FERC provided two power flow models, representing the 2024 WECC<sup>1</sup> system at heavy summer and heavy winter loading. These two power flow models represent the extreme utilization of the electric system that lead to the basis for reliability impacts. Both power flow models have the EEP in service. I developed complementary power flow models without the EEP in service in order to determine if there is a reliability need for EEP.

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<sup>1</sup> Western Electricity Coordinating Council, the regional entity responsible for compliance monitoring and enforcement of reliability standards in the Western Interconnection. WECC also coordinates the operating and planning activities of its members, including PSE.

During the course of my analysis, PSE revised EEP to upgrade only the “South Segment,” comprising of the Talbot Hill-Lakeside transmission line to a new 230 kV transformer referenced as “Richards Creek.” The South Segment still includes the 4 miles that would be located in the City of Renton. Although, the revised EEP includes components of the original EEP, it is necessary to re-demonstrate performance since the electric grid operates in an integrated fashion and removing one planned segment (in this case, the northern section of EEP) represents a different design with a unique set of reliability impacts. I note further that PSE has not provided a technical study of the revised EEP design though information provided by City of Bellevue staff indicates: “PSE’s analysis supported and demonstrated that operationally the Project must include 230 kV transmission lines connecting the Talbot Hill substation in the south to a new transformer in central Bellevue.”

In order to evaluate the revised EEP design (the South Segment), I developed two additional power flow models. Each model represents the 2024 summer and winter peak conditions with the revised EEP design in service. These two additional power flows are necessary to assess the unique reliability performance characteristics of the revised EEP design. In similar fashion, I would expect that PSE would conduct a separate assessment of the revised EEP design. Since the revised EEP plan includes a single source of 230 kV power to energize the proposed Richards Creek substation, any analysis should include the alternative of energizing the new substation with new transmission from the Sammamish substation to the north. Even if the plan is to eventually implement the original EEP design with construction of the Northern Segment, it is still necessary for the revised EEP design to demonstrate compliance with standards set by the NERC<sup>2</sup> and WECC.

Power system reliability depends upon the acceptable responses to various contingencies that may occur on the grid. For example, for a sudden outage of a power transformer, there are acceptable limits for loading that the neighboring transmission facilities can attain in response to the change. If a planned transmission line is removed from a project as in the case of changing the original EEP to the revised EEP, the response of the grid changes, and the determination as to whether or not contingencies lead to overloads and other electrical impacts also changes. Hence, the need to conduct a separate study even if the revision to a plan appears to lead eventually back to original plan. The revised EEP will have distinct and unique loading impacts to the original EEP.

Furthermore, alternatives to the EEP will also be different between the original EEP and the revised EEP. Where non-wires alternatives (NWA) may be infeasible for the original EEP, the same may not be the case for the revised EEP. Or, where the original need may indicate transmission line upgrades, the revised plan may indicate transformer replacements rather than line upgrades.

Changing the EEP design necessitates the assessment of reliability performance of the revised design and subsequently a re-assessment of the alternatives to the design. Of course, the comparative environmental and community impacts would also require reassessment to make a comprehensive and informed decision.

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<sup>2</sup> The North American Electric Reliability Corporation (NERC) is the entity responsible for developing standards for electric power system operation, monitoring and enforcing compliance with those standards.



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Please contact me if you have any questions or need additional information.

Sincerely,

A handwritten signature in blue ink, appearing to read "Ric Austria", is written over a large, light blue, stylized circular graphic element.

Ric Austria  
Principal  
Pterra Consulting  
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Albany, NY 12205