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Steven V. King
Executive Director and Secretary
Washington Utilities and Transportation Commission
P.O. Box 47250
1300 S. Evergreen Park Drive S.W.
Olympia, WA 98504-7250

**RE:** Joint Comments of Joint DR Providers, EnerNOC, Inc., and CPower, Inc., to Dockets UE-141170, Puget Sound Energy 2015 Integrated Resource Plan.

Dear Mr. King,

On December 9, 2015, The Washington Utilities and Transportation Commission (Commission) issued a notice that it would accept written comments on Puget Sound Energy's (PSE or Company) integrated resource plan for electric and natural gas service, with a due date for comments of January 15, 2016. The notice also established a recessed open meeting on March 4, 2016, at which PSE representatives will present the plan to the Commission and the public.

An "integrated resource plan" (IRP or Plan) describes the mix of generation and supply resources and efficiency improvements that will meet both the current and future energy demands at the lowest cost to the utility and its ratepayers.

EnerNOC, Inc., and CPower, Inc.,(collectively, the "Joint DR Parties" or "JDRP") hereby submit these Joint comments to Commission's request for written comments in the PSE integrated resource plan.

# 1 Introduction

The Joint Demand Response Providers ("JDRP") appreciate the opportunity to submit comments to WUTC regarding the Puget Sound Energy (PSE) draft 2015 IRP.

The JDRP advisor, EQL Energy, was active in the PSE IRP Advisory Group and has provided the JDRP with a summary of key issues and insights into the process. The JDRP is interested in promoting the following in utility IRPs and electric service planning and operations:

1. Planning for Distributed energy resources (DER) or using the PSE term Demand Side Resources (DSR), e.g., energy efficiency, demand response, dispatchable standby generation, solar, storage, EV charging, CHP, etc., and
2. Use of Distribution resources planning to determine locational value and capacity analysis across utility distribution system.

EQL is an energy industry consultancy started in 2010 to assist utilities, utility customers, and vendors to develop smart grid technologies and business cases that lower cost of utility service, improve reliability, and integrate renewable energy. Our staff has supported IRPs throughout the WECC region and MISO since 1993. Since 2010, our work has consisted of smart grid technology evaluation/planning, and integration of renewable energy and DER. We work with industry experts in resource, transmission and distribution planning, grid modernization (e.g., managing advanced inverters and DG integration), microgrid and storage development, demand response technology and program design, etc.

EQL is working in partnership with JDRP companies to contribute input and analysis to planning processes and regulatory proceedings in the Pacific Northwest. Our goal is to increase efficiency of both energy use and capital expenditures by Northwest utilities by balancing procurement of supply-side and demand-side resources.

We appreciate the robust analysis conducted by planners in the region, including PSE and the Northwest Power and Conservation Council (NPCC). The changing resource mix going forward (such as retirement of coal-fired units), and ongoing refinement of regional resource adequacy analysis is indicating an increasing need for capacity. We fully support inclusion of demand response (DR) in resource portfolios that need capacity, as PSE, NPCC, and other utilities have done.

The NPCC included DR in its Regional Portfolio Model for 7$^{th}$ Power Plan resource analysis, finding that deployment of DR reduces total system cost and risk.[1] Likewise, PSE's IRP analysis (Chapter 6 page 58) shows the set of demand side resources (DSR) PSE modeled results in a nearly $2 Billion decrease in total system cost over the 20-year planning period.

We offer the following comments on PSE's 2015 IRP and suggestions for upcoming procurement processes for DSR.

# 2 IRP and Demand Response Analysis Comments

PSE uses two steps to construct and analyze resource strategies. First, deterministic portfolio analysis is used to optimize resource selection given static inputs, resulting in candidate resource strategies. Second, a stochastic model is used to scrutinize this set of resource strategies against a large number of possible future outcomes to gauge risk.

[1] Chapter 3, Resource Strategy description of DR findings indicates system cost and economic risk http://www.nwcouncil.org/media/7149676/7thplandraft_chap03_resstrat_20151020.pdf

In reviewing this methodology, and that of PSE's consultant for DSR potential, we have identified the following potential improvements:

## Obtain all cost effective demand response.

Just like energy efficiency, PSE should pursue all cost effective demand response. They should do this not based on consulting reports like Cadmus, but should query providers through RFP processes. The Cadmus report is missing information regarding DR details so it is difficult to consider its validity.[2]

PSE is expecting a capacity resource need in the next ten years, and therefore any cost effective demand response procured now can address this need. DR, like energy conservation, requires customer participation and value proposition. Because DR is new in the PSE service territory, PSE should expect the ramp rates to be slower than in areas where customers have been exposed to the cost and service benefits that come from DR program participation. It will be important to start the procurement and implementation process to identify near term cost effective opportunities.

Programs and agreements with 3rd party service providers, like energy conservation, are common and places the risk of cost effectiveness onto the service provider and not onto the utility or ratepayers.

Energy Conservation and Demand Response are driven by technology which improves quickly and becomes increasingly cost effective at a rate not reflected in PSE or many other utility IRPs. For instance, half of the cost effective measure savings in the NPCC 7th Plan did not exist in the 6th Plan.

## Incorporate a DR supply curve into deterministic analysis.

The energy efficiency component of DSR is divided into 10 bundles (ranging from $28/MWH to $190/MWH), which are inputs to the deterministic step. PSE states in Chapter 6 that bundle D ($115/MWH - $130/MWH), is the most commonly selected bundle in deterministic modeling.

In future IRP analysis we suggest that similar methods be applied to demand response resources in order for planners to gain additional insight into the relationship between a DR supply curve and total system cost. For DR, the DSR potential consultant report identifies a single bundle, consisting of five program types, which is assigned to each candidate resource strategy.

## Winter Demand Response

In a 2015 report for Northwest Power and Conservation Council (NPCC), Navigant estimates that by 2030 Northwest utilities will have achieved nearly **9% of winter peak** load from demand response.

> *The estimated cumulative DR market potential for capacity programs represents nearly 9% of winter peak load by 2030. This estimate is in line with*

[2] For example, Cadmus uses $581/kW for residential DLC room and water heat. No source or justification is provided for this cost nor is there a description of whether it is for a retrofit or equipment replacement application.

*estimates of other DR potential studies conducted both in the Northwest and other parts of the country.*[3]

We think Cadmus made a mistake by stating that PSE could achieve DR amounts to 4.5% of Winter Peak in 2035. Cadmus suggested a potential DR of 181 MW in 2035. With a winter peak of 6,700 this yields a 2.7% of peak. Table 1 lists our estimates of DR percentages of winter peak we saw in the IRP.

Table 1: PSE 2015 IRP Winter DR Estimates

| | 2021 | 2028 | 2035 |
|---|---|---|---|
| Load (IRP Base Fcst) | 5300 | 6000 | 6700 |
| DR | 121 | 130 | 181 |
| % of Peak | 2.28% | 2.17% | 2.7% |

As another data point for WUTC to consider, 2014 Winter DR in the Northeast of North America is between 2.5% to 6.5% of peak. See Figure 1 below. This amount will likely increase with Supreme Court decision that System Operators can pay incentives to DR participants.

Figure 1: 2014 DR by Region[4]

| NERC Region | Peak Season | Winter Peak MW | Summer Peak MW | Winter DR | Winter % of Peak | Summer DR | Summer % of Peak |
|---|---|---|---|---|---|---|---|
| **Midcontinent ISO** | Summer | 103,238 | 127,319 | 2546 | **2.5%** | 5031 | 4.0% |
| **MRO Manitoba Hydro** | Winter | 4,591 | 3,151 | 241 | **5.2%** | 0 | 0.0% |
| **MRO MAPP** | Winter | 5,736 | 4,975 | 370 | **6.5%** | 94 | 1.9% |
| **MRO SaskPower** | Winter | 3,469 | 3,237 | 86 | **2.5%** | 165 | 5.1% |
| **NPCC Maritimes** | Winter | 5,398 | 3,738 | 259 | **4.8%** | 312 | 8.3% |
| **NPCC New England** | Summer | 21,086 | 26,710 | 656 | **3.1%** | 638 | 2.4% |
| **NPCC New York** | Summer | 24,737 | 33,567 | 843 | **3.4%** | 1124 | 3.3% |
| **NPCC Ontario** | Summer | 22,149 | 22,991 | 555 | **2.5%** | 591 | 2.6% |
| **NPCC Québec** | Winter | 37,985 | 21,203 | 1708 | **4.5%** | 0 | 0.0% |

[3] http://www.nwcouncil.org/media/7148943/npcc_assessing-dr-potential-for-seventh-power-plan_updated-report_1-19-15.pdf

[4] NERC 2015 Summer Assessment: http://www.nerc.com/pa/RAPA/ra/Reliability%20Assessments%20DL/2015_Summer_Reliability_Assessment.pdf. Nerc 2014/2015 Winter Assessment: http://www.nerc.com/pa/RAPA/ra/Reliability%20Assessments%20DL/2014WRA_final.pdf

## Locational value of DR - Include integrated transmission, distribution, and resource analysis.

We expect that additional benefits can be derived from DSR including DR by integrating DSR acquisition planning and delivery with transmission and distribution system needs. This is an emerging planning analysis that some jurisdictions and utilities are beginning to adopt. We suggest analysis tools be considered for use by planners that assign locational value to DSR in such a way that existing and anticipated T & D constraints can be partially or fully mitigated by targeted DSR procurement. Avista Energy has begun to use distribution resources planning to evaluate DER and infrastructure investments to support regional capacity and service quality.

## Define specific resource requirement types and amounts, e.g., operating and contingency reserves.

DSR, including DR, can meet different types of utility resource requirements in addition to energy. In order for DSR to meet the requirement, PSE should clearly define the resource requirement and its details, e.g., response times and availability times. This should then drive the DSR analysis.

PSE makes the case in their IRP that increasing capacity requirements will occur, even in low load growth scenarios due to changing planning requirements, e.g., LOLP, or NERC contingency reserve requirements. The Electric Analysis in PSE's IRP describes contingency and balancing reserves, but does not discuss amounts. This gets challenging when capacity resources are being asked to provide flexible capacity throughout the year to assist with integration of renewable energy, or emergency capacity required in the event of a line or generator outage. IRPs need to describe the type of resource needs, e.g., energy, peaking capacity, load following, contingency reserves[5], frequency regulation, VAR support, etc.

This detailed description and forecast will allow for PSE and its demand side service providers to prepare and plan DER accordingly. There are many types of DER that can provide utility and grid resources traditionally provided by supply side. If this is not done, PSE and ratepayers risk over building or purchasing supply side resources where DSR could have met the requirement. For instance,

- Portland General Electric has 100MW of dispatchable standby generation that meets the contingency reserve requirement.
- BPA is procuring 10 minute DR that will provide a contingent resource in the event of a transmission outage (N-1).
- System Operators around the country are allowing or working out DR to participate in their reserve markets. January 25, 2016 the Supreme Court ruled that FERC and system operators have the authority to provide incentives to customers participating in demand response programs.[6]

[5] http://www.nerc.com/files/BAL-002-WECC-2.pdf
[6] http://www.utilitydive.com/news/updated-supreme-court-upholds-ferc-order-745-affirming-federal-role-in-de/412668/

WECC rule Bal-002-WECC-1 was referenced by PSE[7] as one of the reasons the reserve amounts are increasing. This same rule allows a balancing authority to use a number of different resources to meet this requirement including demand response:

> "* A resource, other than generation or load, that can provide energy or reduce energy consumption
> * Load, including demand response resources, Demand-Side Management resources, Direct Control Load Management, Interruptible Load or Interruptible Demand, or any other Load made available for curtailment by the Balancing Authority or the Reserve Sharing Group via contract or agreement."

Recommendation: List and provide detail on all resource requirements, e.g., Contingency reserves, Balancing reserves, planning margin over planning horizon. Separate and define these from the peak demand forecast. This will help during procurement and operation of demand response and other DSRs.

# 3 Demand Response Procurement Comments

While PSE's analysis provides essential system planning information relating to cost and risk reduction through deployment of DSR, we believe additional information is needed to take subsequent steps moving closer to final procurement quantities. In order to ensure these quantities are consistent with PSE's planning methods for system-wide cost and risk minimization, PSE's procurement framework should be structured such that it directly compares all resource types and capacity providers that bid.

**Leverage competitive market forces to secure the right DR quantity at the right cost.**

Design RFP(s) such that they solicit robust participation from DR providers and procure an economically efficient quantity of DR. Issue an RFP prepared by a knowledgeable consultant for all cost-effective DR. Such an RFP should reflect all avoided costs, adjustment factors, and value of capacity resources. Examples of avoided costs include:

1. Avoided Capacity Costs
2. Avoided Energy Costs
3. Avoided Transmission & Distribution Costs
4. Avoided Ancillary Service Costs
5. Revenues from Wholesale DR Programs
6. Market Price Suppression Effects
7. Avoided Environmental Compliance Costs
8. Avoided Environmental Externalities
9. Participant Bill Savings
10. Financial Incentive to Participant

[7] PSE IRP Chapter 6 page 16

11. Tax Credits
12. Other Benefits (e.g., market competitiveness, reduced price volatility, improved reliability)

### Define resource need in detail

With respect to DR, define what PSE needs. Day ahead? Or 10-minute spin reserve? How many hours per year, which hours of the day, season, consecutive days, etc.

### Consider Integration of DR with Energy Imbalance Market implementation at PSE

PSE expects a fall 2016 Western EIM go-live date. Because DR resources are currently eligible participating resources under the ISO's EIM tariff, and DR is currently participating in the ISO's real-time energy market[8], PSE should consider the degree to which integration is appropriate. We note that on December 17, 2015, FERC approved a tariff filing[9] relating to the Western EIM that enables the ISO to recognize the available balancing capacity that PSE has available to it for maintaining reliability (such as DR), for which PSE has not offered to the market. Because the ISO is likely to have at least some interaction with DR (visibility into demand response operation and performance) at PSE, we believe an inquiry into further integration may be beneficial.

[8] http://www.caiso.com/Documents/Jan15_2016_AnnualReportEvaluatingDemandResponseParticipation_2015_ER06-615.pdf
[9] http://www.ferc.gov/whats-new/comm-meet/2015/121715/E-3.pdf