PACIFIC POWER
A DIVISION OF PACIFICORP

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November 4, 2016

VIA ELECTRONIC FILING

Public Utility Commission of Oregon
201 High Street SE, Suite 100
Salem, OR 97301-3389

Attn: Filing Center

Re: UM 1667—PacifiCorp's Reply Comments

PacifiCorp d/b/a Pacific Power submits for filing its reply comments on its 2016 Smart Grid Report.

Please direct any questions concerning this filing to Natasha Siores at (503) 813-6583.

Sincerely,

R. Bryce Dalley
Vice President, Regulation

Enclosures

BEFORE THE PUBLIC UTILITY COMMISSION
OF OREGON

UM 1667

In the Matter of PACIFICORP d/b/a PACIFIC POWER 2016 Annual Smart Grid Report	**PACIFICORP'S REPLY COMMENTS**

On August 1, 2016, PacifiCorp d/b/a Pacific Power (PacifiCorp or Company) submitted its 2016 Annual Smart Grid Report (Report) to the Public Utility Commission of Oregon (Commission) under Order No. 12-158.[1] In October 2016, the Company received comments on the Report from Commission Staff and the Oregon Department of Energy (ODOE). The Company provides these reply comments in response to the comments of Staff and ODOE.

I. Stakeholder Process

At the November 13, 2015, Special Public Meeting in the Company's Smart Grid proceeding in docket UM 1667, the Company committed to providing an updated timeline on its advanced metering infrastructure (AMI) efforts in early 2016. On April 6, 2016, the Company filed a letter in its Smart Grid docket that provided an update to the Commission on the Company's efforts regarding AMI. The letter indicated the Company intends to develop and install an AMI system in Oregon that reduces operating costs, improves customer service, and provides an information technology platform that can be leveraged for future progressive applications. Further, the letter stated that the Company plans to place meters into service within the next three years and to hold stakeholder workshops to receive input, address concerns, and discuss the benefits of the project.

[1] Docket No. 1460 (May 8, 2012).

On July 12, 2016, the Company held a stakeholder workshop to provide an overview of the AMI project. The presentation included the topics of planned project schedule and scope, characteristics of AMI meters, vendor selection and the Company's project management. On that same day, a second stakeholder workshop was held to receive feedback, comments, and questions from stakeholders with regard to the Company's draft 2016 Smart Grid Report that was distributed to stakeholders on July 5, 2016. The Company appreciates the time and attention of the stakeholders attending these workshops and the questions and comments. These interactions, along with the written comments provided by parties on July 15, 2016, on the draft report provided valuable feedback to assist the Company in preparing a thorough and robust 2016 Smart Grid Report.

II. PacifiCorp's Response to Informal Written Comments from Staff and ODOE

The final Report, filed on August 1, 2016, included Appendix B that provided a high-level table summary of the comments received from Staff and ODOE and the Company's corresponding responses and a cross-reference to the location of the discussion of these responses in the Report.

III. PacifiCorp's Response to Formal Comments

A. Overview of PacifiCorp's Response

The Commission adopted non-substantive smart grid reporting requirements to ensure that "utilities are systematically evaluating promising smart-grid technologies and applications, that the Commission is kept apprised of utilities' progress, and that stakeholders, Commission Staff, and the Commissioners have an opportunity to provide input into utility evaluations of smart-grid technologies and applications, as well as their plans for smart-grid investments."[2]

[2] Order No. 12-158 at 1.

Recognizing that "smart grid is comprised of many technologies, in different stages of development and affordability," the Commission has expressly declined to require utilities to submit comprehensive "smart grid plans."[3]

Furthermore, the Commission has declined to adopt "detailed and … prescriptive" guidelines for smart grid reports "given the early stages of smart grid development."[4] To that end, the Commission established a series of "general Commission guidelines" for utility smart grid reports via an "informal process" that allows for stakeholder input.[5]

B. PacifiCorp Response to Staff Comments

PacifiCorp's reply comments are organized by responding to Staff following the structure outlined in its comments. Staff's comments are repeated and provided below in italics; the Company's response is in regular font.

1. *Staff requests that the Company explain in its reply comments why the West-of- Populus site was originally chosen for a DLR project, what the initial appeal of the site was, and any insight as to why the line no longer appears to be thermally constrained/is reporting back irregular line ratings.*

PacifiCorp Response

The thermal constraint referred to in the Report occurs under system conditions where there are high flows on the Bridger West lines and Path C northbound lines, and when there is an N-2 outage contingency (meaning two lines are out of service because of one event) on the West-of-Populus lines. The initial appeal of the dynamic line rating (DLR) project was to allow the simultaneous heavy flow conditions as mentioned above by optimizing the line operation according to weather conditions. In addition, the DLR project was considered a pilot project to provide an opportunity to understand the process and output of DLR technology.

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[3] *Id.* at 2.
[4] Order No. 11-172 at 2.
[5] Order No. 12-158 at 2.

Since implementation, the probability of high flows on the West-of-Populus lines has diminished due to peak loads at Pacific Power and Rocky Mountain Power gradually coinciding over time. While the thermal constraint from a planning perspective is still in effect, given the current trend it is unlikely the constraint conditions will occur. Although DLR data will continue to be monitored, reporting on the West-of-Populus DLR project will discontinue in future smart grid reports. However, as evidenced by the success of the Platte line DLR project as discussed in the 2015 Smart Grid report, DLR will remain an important tool for use in system planning.

2. *Staff requests that the Company add more specifics about the redundant relays in its Reply Comments. What, if any disadvantages are there to redundant relays as opposed to the thermal replicating relays? What, if any advantages are there to redundant relays (other than cost)?*

PacifiCorp Response

In order to meet NERC compliance standards, either a Remedial Action Scheme (RAS) or thermal replicating relay system is required on the Soda Springs – Grace transmission system. One of the requirements of the application of RAS in a system is all components of the RAS must be redundant. The redundant relays described in the Report fulfill that requirement.

One advantage of the RAS over the thermal replicating relays is its simplicity in application. For the thermal replicating relays, multiple weather stations along the transmission line communicating back to the substation are required to monitor conditions of the line. The complexity of the data gathering and communicating systems is significantly greater than the RAS, thus requiring more maintenance and presenting a greater opportunity for failure. During maintenance or failure of any part of the thermal replicating relay system, system reliability would be negatively affected.

3. *Staff requests that the Company provide in its Reply Comments information (if any) as to additional analysis that is occurring via the 2017 IRP process. Staff also anticipates an update to this project in the 2017 Smart Grid Report.*

PacifiCorp Response

No additional analysis is occurring as part of the 2017 IRP process.

4. *Staff requests that the Company state in its reply comments how it plans on utilizing the PMU data once it is available. Staff anticipates an update to this project in the 2017 Smart Grid Report.*

PacifiCorp Response

On August 11, 2016, the Company informed Peak Reliability[6] that it would be discontinuing its transfer of phasor measurement unit (PMU) data to Peak Reliability as part of the Western Interconnection Synchrophasor Program (WISP). Peak Reliability has confirmed that although it will be making PMU data available to users through its website, the utilization of that data and the development of tools for use in its control room is at least a year away. The Company plans to revisit supplying PMU data to Peak Reliability as their operations move closer to utilization of PMU data in practice.

The Company sees the greatest value of PMU data residing in the situational awareness capability and visibility to Peak Reliability. Since the Company has situational awareness capability through its SCADA system in circuit breaker status, line loading levels, and generation output, the Company does not at this point have explicit plans to utilize PMU data in its control center. The Company may be able to utilize PMU data at the extents of its system to increase awareness of stress on its system, but it is unclear what mitigating strategies would result. As tools are developed by the industry to address how PMU data is viewed, analyzed, and put into practice, the Company can evaluate their adoption. Peak Reliability will serve as an excellent resource as the Company observes their implementation of tools to utilize PMU data.

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[6] Peak Reliability - Provides situational awareness and real-time monitoring of the Reliability Coordinator (RC) Area within the Western Interconnection.

5. *Staff requests that the Company provide in its reply comments load curtailment data for all seven events and explain why the program was not dispatched more often.*

PacifiCorp Response

In order to maximize its effectiveness, the Company uses adverse system conditions due to loading impacts, as well as guidelines of forecasted temperatures and day-ahead market prices to determine program dispatches. Higher temperatures in the month of June in 2015 drove a majority of the dispatches. Temperatures and correlated peak loading trended down in the latter months of the summer in 2015 resulting in fewer dispatches. In addition, there were no adverse system conditions observed that warranted a dispatch. There were additional days that met the guidelines where no dispatch occurred due to concerns of customer opt out or complaints from consecutive day dispatches.

The following tables for Utah and Idaho respectively, supply the load curtailment data requested:

Date	Event	Event Times	Estimated Load Reduction - Utah at Gen (MW)
June 16, 2015	1	4pm - 8pm	7
June 18, 2015	2	4pm - 8pm	6
June 22, 2015	3	4pm - 8pm	9
June 25, 2015	4	4pm - 8pm	11
June 26, 2015	5	4pm - 8pm	9
June 29, 2015	6	3pm - 7pm	10
July 1, 2015	7	4pm - 8pm	12

Date	Event	Event Times	Estimated Load Reduction - Idaho at Gen (MW)
June 16, 2015	1	4pm-8pm MDT	137
June 18, 2015	2	4pm-8pm MDT	151
June 22, 2015	3	4pm-8pm MDT	160
June 25, 2015	4	4pm-8pm MDT	162
June 26, 2015	5	4pm-8pm MDT	146
June 29, 2015	6	3pm-7pm MDT	169
July 1, 2015	7	4pm-8pm MDT	158

6. *Staff requests that the Company provide an update in its reply comments as to the provision of these studies.*

PacifiCorp Response

The Company provided the PacifiCorp study to Commission staff on October 25, 2016.

7. *Staff requests that the Company provide additional details in its reply comments as to what is needed to establish communications with Fuse Savings devices and existing barriers to integrating Fuse Savings devices with the SCADA Monarch energy management system.*

PacifiCorp Response

A field area network is required to establish communications with Fusesaver devices, or a cellular modem could also be installed with the Fusesaver. In addition to the communications, a data collection application program interface (API) would need to be implemented, then interfaced with the Company's outage management system (OMS) or SCADA Monarch energy management system (EMS). A review is underway to compare linking distribution devices to the OMS versus EMS and to determine which provides the greater benefit. The current barriers to implementing Fusesavers into the OMS or EMS include the need for a field area network, an API to interface with the management systems, and modifications to the management systems to accept the field data.

8. *In a clarification to this recommendation, Staff responded to the Company as follows in attachment 1: Staff is looking for updates on the smart grid capabilities of these devices, be it from devices already installed and said capabilities activated, or for new devices installed. Staff expects the Company to describe circumstances under which smart grid functionality can be activated for these devices if such functionality is not readily available upon installation.*

   Staff requests that the Company provide more insight in its reply comments as to the benefits clarified by Staff in Attachment 1.

PacifiCorp Response

To date none of these devices, although installed with smart grid capabilities, have had communications enabled. The evaluation of communication protocols mentioned in the Report refers to the ongoing engineering standards and procurement process of evaluating new equipment, in particular the devices mentioned in Recommendation #10. This evaluation was included as part of the standards process, and simply ensured the new devices had communication capability and utilized the DNP 3.0 protocol. This capability will enable the future status indication and control of these devices from a centralized location, such as a distribution management system.

The primary circumstance under which these devices would be enabled is after a field area network, with which the device controls could communicate status and control functions, has been established and a distribution management system has been installed to handle the data and control functions.

9. *Regarding Recommendation 11: Provide a summary of ongoing efforts of completing a cost benefit analysis of CFCIs, including alternative communication technologies such as AMI, in case the cost-benefit analysis is not ready for the 2016 Smart Grid Report.*

Staff requests that the Company provide in its reply comments additional information or update to Recommendation 11.

PacifiCorp Response

Communicating Faulted Circuit Indicators (CFCIs) currently being utilized by the Company communicate via integrated cellular and would not be compatible with the AMI field area network approved for installation in Oregon. The CFCI vendor has plans to provide this functionality in the future. Similar barriers exist with the CFCI integration into OMS as to Fusesavers mentioned in staff request #7. Given the cellular mode of communication, a different API would be needed to collect data and translate it to interface with the OMS. Costs to integrate CFCI data to the OMS are being investigated with the OMS vendor.

10. *Staff requests that in its reply comments the Company outline a complete and comprehensive list of benefits of utilizing CYME as opposed to ABB FeederAll in its Reply Comments.*

PacifiCorp Response

ABB Feederall has been the company distribution system planning software since the 1990s. ABB Feederall was effectively integrated in many company systems and processes. When ABB discontinued sales, technical support and advancement of its product effective 2007, the Company was obligated to find a replacement suite of distribution planning software tools. The following is a functionality list of CYME and its capabilities to meet planning engineering needs to perform customer and distribution system planning studies. CYME offers specific power flow scenarios run individually and offers algorithms to optimize system performance, modeling capability to analyze other needs such as harmonics and secondary networks, and studies that run power flow scenarios over time with variable inputs.

Vendor Support

- CYME is a world leader in power flow analysis software and provides support in the following areas: technical assistance, training and addressing enhancement requests.

Product Development & User Community

- CYME supports new devices like electronic sectionalizers and intermittent generation (i.e. solar generation).
- CYME's features have grown dramatically based on user feedback, and the interface is helpful to users.
    - New analysis modules and features are continually added to the list of available options.
    - The vendor adds new devices as the market evolves.

- Other utilities have remained engaged as members of a user group community, and enhancement requests are prioritized within this community.
- Sharing studies with other utilities and contractors is now possible, as the CYME user base is so broad.
- Protective device analysis now takes place inside the power flow model, so load current, steady state voltage and available fault current are associated to each line device.

Capital Planning Accuracy and Additional Functionality

- The electrical analysis of each system concerning power flow and short circuit results is a critical component of budget, risk management and troubleshooting. With regard to accurate planning results, CYME offers the following:
  - Additional meter scenarios and allocation options.
  - Scaling factors for loads, motors and generators.
  - Multiple equipment rating categories.
  - The inclusion of time in power flow analyses, including device delays.
  - Load balancing and capacitor placement optimization algorithms.
- CYME also includes improved study processes that improve efficiencies in engineers' analyses of the distribution system.
  - Sequence of events and device coordination analyses allows users to fine tune device settings for better reliability.

- Time series analysis with Long Term Dynamics and Energy Profiles will allow time-sensitive load, generation and device delays to be studied holistically.
- Batch analysis and scripts will allow users to automate many time consuming activities and query their models for specific criteria.

CYME has many graphical screens, output tables and software tools available to planning engineers. The Company would like to offer staff the opportunity to see a CYME demonstration at their convenience if interested. This demonstration will provide greater insight into the software capabilities and its importance to planning engineers that provide customer and distribution system solutions.

11. Regarding Recommendation 14: Provide a quantitative and qualitative comparison of the Cool Keeper program's performance before and after the efficiency improvements in the 2016 Smart Grid Report.

Staff found the data applications useful. Staff requests that the Company explain in its reply comments whether it regularly runs the analytics it describes in the Smart Grid Report and whether it was able to garner additional quantitative comparisons from the data.

PacifiCorp Response

Daily Resource Analysis. The program managers and system administrators monitor this value daily. It is used as a key performance indicator of system health and used to prioritize site visits to participating customers. The data from this analysis is used directly by the Hourly Forecasting subsystem.

Hourly Forecasting. The system calculates a new forecast every time the live weather data is updated, when a program is activated and periodically (e.g. every 10 minutes). The forecast data for each customer segment is saved as historical data. The Company's energy supply management team has access to the real time data information to effectively schedule demand response events.

Event Validation. Program administrators perform event validation within a few days after every demand response event. The analysis includes ensuring that program participants received the control signal and the devices responded correctly during the event. Any discrepancies that are found are logged for further analysis. The event validation also includes comparing the actual load reduction achieved against the forecast to make sure the forecast error is minimized.

Customer Segmentation. The system continuously collects the information on air conditioning usage for each program participant. Each week we aggregate the usage information for each hour/day and use it to create baseline reports. The reports include graphs that show segment load shapes. This data is used to compare against the diversified load calculation (part of forecasting) to validate the forecast calculation. At the end of the Cool Keeper season, program administrators take the aggregated usage information and create revised forecast equations in preparation for the next control season.

Ad-Hoc Analysis. The data collected by the system allows the program administrator to validate program performance and determine ways to improve the program. There are several examples of this analysis including:

- **Short Control Event.** Energy supply management scheduled an event and cancelled it immediately after it started. Program administrators used the information to verify that customers received the signals in order, without conflict.

- **Additional Sub Populations**. Program administrators investigated an additional customer segment (sub population of the commercial users) to determine if their usage behavior was significantly different from the full group to affect the forecast calculations.
- **Event Snap Back Analysis**. Program administrators continue to perform energy snap back analysis from every event for each segment.
- **Control Algorithm Performance.** Program administrators performed an analysis on the control algorithms used in the load control devices for 2015 and 2016 as a population and on individual program participants to validate that the revised algorithm increased program performance.

12. Staff requests that the Company provide an update to the DER study in its 2017 Smart Grid Report.

PacifiCorp Response

The Company will include a summary of the DER analyses that are performed as alternative solutions to system reinforcement projects, as well as a few examples of the analyses in its 2017 Smart Grid Report.

13. <u>AMI Implementation</u>

<u>Customer Benefits</u>

The workshop on September 28th revolved around these issues. Of the benefits Staff found to be most relevant is the outage restoration time upon bill payment. The Company discussed expanding the locations of its pay stations, and because of AMI remote connection/disconnection functionality, the Company explained it would be possible for customers to receive service much more quickly than before, possibly within minutes.[41] In the workshop, the Company also cited quicker outage detection as a result of its AMI rollout.

Staff requests that the Company provide a clear explanation in its reply comments of the quicker response time functionality, reconnection functionality, and outage detection functionality. Staff also would like PacifiCorp to provide a cost and benefit estimation of these functionalities.

PacifiCorp Response

As applied today, if a customer is disconnected for non-payment, reconnection of the customer entails a process of receiving payment, payment processing in the Company's customer service system, creation of a reconnection order, and dispatching personnel to reconnect the customer at their premises. Under this process, from the time a customer makes a payment until the customer is reconnected can take up to 24 hours.

With the AMI activated, after receiving payment from the customer a command will be sent via the AMI system through the field area network to the customer's meter to reconnect service automatically. It is expected reconnection will occur within one to five hours of receipt and processing of payment.

The cost of the reconnect functionality is included in the total cost of the AMI project. The benefit as stated in project documentation, most of which is based on the saving of dispatching personnel for manual disconnect/reconnect, is an annual savings of $3.16M.

The outage detection functionality included with the AMI system refers to the ability the Company will have to interrogate meters to determine if they are energized. As the process stands today, if a customer calls in to report an outage and it is only affecting that single customer, the Company will send outage response personnel to determine the cause of the outage. Often times, the Company meter is energized when the company response personnel arrives, indicating an issue on the customer's electrical system. At this point the Company recommends the customer contact a qualified electrician to assist in finding and fixing the issue.

With the AMI outage detection functionality, the Company will be able to ascertain in most cases, whether or not the meter is energized from the AMI system and determine if the issue is on the Company's side of the meter, or on the customer's system. When determined to be a customer issue, the Company will benefit in saving the cost of dispatching personnel. It will also provide the customer a benefit by providing information about their system much sooner than if they had to wait for Company response personnel to arrive and perform testing.

The outage detection functionality will also provide valuable data during outage restoration. The AMI software can be configured such that an interrogation to determine if meters are energized can be sent to a defined group of meters, such as a circuit. This functionality can be useful in outage restoration efforts where the Company has restored power to a circuit and presumes all customers associated with that outage are restored. In certain cases a secondary or nested outage, such as a fuse operation, could have occurred simultaneous to a circuit level outage and customers could remain out of power. The AMI outage detection functionality will provide visibility to the nested outage scenario and enable a timely response.

The cost of the outage detection functionality is also included the total cost of the AMI project. The reliability benefits are not quantifiable due to the absence of data specific to the outage scenarios described.

14. <u>AMI Functionality and Capability</u>

The Company does not appear to have a clear plan for utilizing the full list of capabilities offered by the meters and data. In particular, Staff believes that the Company's responses to discovery on demand response (non-docketed DR 17) load curtailment, integrated resource planning (DR 43) and data management (DRs 39 and 42) lacked substance and did not indicate whether the Company even intends to pursue these applications.

As a result, Staff is concerned that the Company's AMI rollout will not eventually transition "capabilities" to "functionalities," and thus customers may not ever receive the full level of potential smart grid benefits.

PacifiCorp Response

The Company has provided a list of future AMI applications in the Report that it intends to investigate. The Company does not plan to pursue these applications unless the investigation and subsequent analysis demonstrate a value to customers sufficient to warrant implementation.

15. Staff requests that the Company further address in its reply comments how it plans on addressing the technology obsolescence risk.

PacifiCorp Response

The Company requires the selected AMI solution to be a robust system with a 25 year system life. Technologies, both hardware and software, are central to the AMI solution; however, technologies often become unsupportable 5-10 years after commissioning. Information Technology experience has proven that system technology updates of critical operational systems are complex with significant risk from system availability and performance degradation.

Very few impacts, if any, have been published regarding technology obsolescence and AMI systems. However, the Company's own experience with rapidly evolving information technology systems and obsolescence highlights the need to consider interoperability with current and future systems. This challenge encourages the use of open protocol network architecture to minimize costs and risks going forward.

There are significant impacts to the project if technologies become unsupportable through loss of patching, parts availability, or inability to operate with dependent technologies such as the cellular system. The following items are plans the Company has implemented to mitigate the obsolescence risk:

- Vendor to include technology support commitments (on-going patches) through the life of the project; ensuring technology will not become obsolete during project life.
- Ensure the communication network architecture is an open protocol versus proprietary.
- Develop AMI project roadmap that includes software patch schedules, and hardware and software updates.

Design failover processes for the new AMI system to minimize the down time of key business functions during upgrade and patching.

B. PacifiCorp Response to ODOE Comments

ODOE AMI Deployment questions:

1. *Why is the hourly data only available to the customer the day after it is metered?*

PacifiCorp Response

The Company will collect the data and then validate it to ensure the quality of the data before presenting to the customer.

2. *Additionally, is the AMI technology capable of providing this information directly to customer home area networks, as opposed to making it available online through a web portal?*

PacifiCorp Response

Yes, the AMI meters are equipped with Zigbee technology, which should allow integration to compatible home area networks.

3. *What is needed in order to allow customers to have access to the information closer to real-time with the possibility of pulling the data directly into a home energy management system?*

PacifiCorp Response

Utilizing the functionality of Zigbee will require the following:

- Activation of Zigbee technology in the meter.
- Customer acquisition of compatible home energy management system.
- Business processes established.
- Integration of Zigbee utilization into Company customer information systems.

Additional Comments from ODOE

ODOE provided additional observations, recommendations and comments regarding the AMI customer portal, transmission network and operations enhancements, substation operations enhancements, and demand response programs that are to be addressed in the 2017 Smart Grid report or other anticipated Company proceedings or reports. The Company appreciates ODOE's thoughtful comments and interest in smart grid progress at PacifiCorp and looks forward to addressing ODOE's comments and suggestions in the 2017 Smart Grid report.

The following table details ODOE's comments and observations, along with the venue in which the Company's anticipated response may be expected.

ODOE Comments	PacifiCorp's Anticipated Response
Comment on customer portal: 1. ODOE is interested in having the company address the ability of customers to directly pull data from AMI onto their home networks, making usage data available to customers on an almost real-time basis.	This capability should be discussed with stakeholders in the AMI stakeholder workshop and as the Company continues to develop its AMI project plan.
Comments on Transmission Network and Operations Enhancements 1. ODOE appreciates the detailed description of how the company is interfacing with Peak Reliability and exchanging data, and understands that Peak Reliability's current focus is identifying and analyzing system vulnerabilities and disturbances on the western grid. It would be useful for the company to include a discussion of lessons learned in future smart grid reports. 2. ODOE looks forward to more information in future smart grid reports on how the synchrophasor data is being used to increase real-time situational awareness for transmission operations.	These issues will be addressed in the Company's 2017 Smart Grid Report.

Comments on Substation Operations Enhancements 1. ODOE looks forward to more details on the energy storage evaluations in the 2017 Smart Grid Report, in particular, the company's evaluations of centralized energy storage alongside evaluations of distributed energy storage. 2. Clear definitions of how the company categorizes "centralized" and "distributed" or "localized" energy storage would be helpful. 3. Additionally, ODOE encourages the company to provide an assessment in future smart grid reports of its ability to leverage AMI and other smart grid technology deployments to enable more distributed, automated demand response assets. 4. It would be helpful to see an assessment not only of demand response assets that reduce peak load to provide a capacity product, but also assets capable of providing load following or fast response ancillary services 5. The considerable detail provided in Appendix F is helpful, and ODOE looks forward to additional examples of DER Template evaluations in future smart grid reports. 6. ODOE supports use of the DER Template in a way that shows potential value for multiple system benefits for DER, similar to the methodology being developed for energy storage	 These issues will be addressed in the Company's 2017 Smart Grid Report.
Comments on Demand Response 1. ODOE is encouraged that the company plans to revisit costs, capacity impacts, and supply curves of current DLC programs like the Cool Keeper as part of the 2017 IRP. ODOE would also be interested in an	 The Company addressed the role of demand response in PacifiCorp's current planning environment, potential future opportunities for demand response programs, and pilot program considerations in its presentation to the Commission at the August 16, 2016

assessment by the company of the flexibility of its Cool Keeper program and whether it has the ability to operate more flexibly to provide other grid services beyond capacity benefits. 2. ODOE continues to be interested in a pilot for winter peaking DR in the company's Oregon territory 3. ODOE looks forward to a compilation of successes and challenges with the irrigation pilot in the Klamath Basin. When the company is reaching out to customers, ODOE encourages the discussion to include the customers' desired length of commitment on the part of the company. We would like to understand if a commitment longer than 3 years might have enticed more participants or higher levels of controllable loads.	public meeting. The Company will provide the presentation to ODOE; the presentation is also available on the Commission's website on the agenda for the August 16, 2016 public meeting. The Company is happy to further discuss these issues with ODOE and to answer any remaining questions on these demand response issues.

IV. Conclusion

The Company appreciates Staff's and ODOE's comments, the opportunity to respond to them, and to present the 2016 Report to the Commission and other Oregon stakeholders.

Respectfully submitted this 4th day of November, 2016.

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