

PUBLIC UTILITY COMMISSION OF OREGON
STAFF REPORT
PUBLIC MEETING DATE: January 25, 2018

REGULAR X CONSENT _____ EFFECTIVE DATE _____ N/A _____

DATE: January 18, 2018

TO: Public Utility Commission

FROM: Mark Bassett *JTB & MB*

THROUGH: Jason Eisdorfer and JP Batmale *JTB & JE* *JTB*

SUBJECT: PACIFIC POWER: (Docket No. UM 1667) Annual Smart Grid Report.

STAFF RECOMMENDATION:

Staff recommends the Commission accept Pacific Power's (PacifiCorp or Company) *2017 Smart Grid Report* filing as having met the requirements of Order No. 12-158 established in Docket No. UM 1460. Staff also requests the Commission accept Staff's recommendations, described below, for future PacifiCorp Smart Grid Reports.

DISCUSSION:

Issue

Whether PacifiCorp has met the reporting requirement set by Order No. 12-158.

Applicable Law

In 2012, the Commission issued Order No. 12-158, establishing smart-grid policy goals and objectives, utility reporting requirements, and Commission guidelines for utility actions related to smart grid. Under Order No. 12-158, utilities were required to file an initial smart grid report that, at a minimum, included the following main elements:

1. Smart grid strategy, goals and objectives.
2. Status of smart grid projects, initiatives, and activities that are underway, results of implemented smart grid projects, and planned smart grid investments for the next five years.

3. Smart grid opportunities the company is considering for the next five years and any constraints.
4. Targeted evaluations pursuant to Commission-approved stakeholder recommendations.
5. Related activities such as investment to address physical and cyber security, privacy, customer outreach and education, etc.

Thereafter, utilities are required to file an annual smart grid report that, at a minimum, includes incremental additions and updates of all elements of the initial report.¹

The Commission accepted PacifiCorp's fourth *Smart Grid Report* (the 2016 report) as having met the requirements of Order No. 12-158. At the same time, in its order accepting the 2016 report, the Commission adopted a combined list of Staff and Commission recommendations for Pacific Power's *2017 Smart Grid Report*. The Commission expressed the expectation that in its next smart grid report, PacifiCorp:

1. Continue to include a high-level table summary of all stakeholder informal comments and corresponding Company responses as an appendix in future smart grid reports.
2. Provide an Advanced Metering Infrastructure (AMI) Roadmap that outlines a framework for tracking the following:
 - AMI costs and cost savings
 - Reliability improvement and reconnection times
 - Mitigating technology obsolescence risk
 - Customer engagement
 - Analysis of AMI data and data application (including but not limited to reliability and resource planning)
 - Transition from AMI "capabilities" to "functionalities" and clearly defined milestones that would motivate this change
3. Timely apprise the Commission of any new developments of new Dynamic Line Rating (DLR) projects.
4. Continue to apprise the Commission of the success, or lack thereof, of its remedial action scheme in the form of redundant relays.

¹ *In re Public Utility Commission of Oregon*, OPUC Docket No. UM 1460, Order No. 12-158, at 4 (May 8, 2012).

5. Provide a comprehensive narrative explaining its developments, or lack thereof, both past and present, with Peak Reliability and Western Electricity Coordinating Council (WECC) and its decision to stop its transfer of Phasor Measurement Unit (PMU) data to Peak Reliability. The Company should also follow through with its commitment to address the Oregon Department of Energy's (ODOE) questions set forth in Staff's memorandum.
6. Provide an update to its irrigation load control pilot and update the table on page 32 of the 2016 Smart Grid Report including Oregon data when it is available.
7. Provide a summary of its review to investigate linking distribution devices to its Outage Management System (OMS) and Energy Management System (EMS).
8. Provide an update on any field area network or communication functionality implementation.
9. Work with Staff and interested stakeholders to schedule a CYME circuit analysis software demonstration no later than April 30, 2017.
10. Continue to keep the Commission apprised of demand response developments in future smart grid reports.
11. Provide its Distributed Energy Resource (DER) analysis, including how it has utilized the transmission and distribution planning tool.²

As explained in more detail in this Staff report, PacifiCorp complied with Staff's recommendations adopted by the Commission in Order No. 16-476, as well as the Commission's reporting requirements outlined in Order No. 12-158.

Analysis

Staff Review

The standard utilized by Staff in its review of the utilities' smart grid reports filed subsequent to their initial reports is set forth below. Staff employed this same standard in reviewing the Company's *2017 Smart Grid Report*:

² *In re PacifiCorp*, OPUC Docket No. UM 1667, Order No. 16-476 at Appendix A, pg. X (Dec. 7, 2016).

1. Whether the Company met the guidelines set forth by the Commission in Order No. 12-158;³ and
2. Whether the Company addressed prior Commission-approved recommendations from prior smart grid report reviews regarding potential smart grid investments and applications.

PacifiCorp submitted its fifth annual smart grid report on August 1, 2017.

Interested parties were asked to file written comments on PacifiCorp's *2017 Smart Grid Report* by November 16, 2017. Staff and ODOE filed written comments. In its Reply Comments filed on December 20, 2017, PacifiCorp addressed Staff's and ODOE's comments.

Background

Below, Staff addresses each of the requirements from Order No. 16-476 (2016 Recommendations), as well as its corresponding recommendation for the *2017 Smart Grid Report* (2017 Recommendations)

- **2016 Recommendation 1:** PacifiCorp should continue to include a high-level table summary of all stakeholder informal comments and corresponding Company responses as an appendix in future smart grid reports.

2017 Smart Grid Report Discussion: In its *2017 Smart Grid Report*, the Company provided a table in Appendix A detailing the Stakeholders, their recommendation descriptions, Company actions, and the page number where the discussion can be found.⁴ In addition, the Company included a table of Staff recommendations and page numbers of discussion in the Executive Summary.⁵

Staff Comments: Staff was satisfied with the Company's table Appendix A.

Staff's 2017 Recommendation: PacifiCorp should continue to include a high-level table summary of all stakeholder informal comments and corresponding Company responses as an appendix in future smart grid reports.

- **2016 Recommendation 2:** The Company should provide an AMI Roadmap that outlines a framework for tracking the following:

³ This should also include incremental additions and updates of all elements of the first report. See Order No. 12-158 at 4.

⁴ Pacific Power Smart Grid Oregon Annual 2017 Report, p. 58-61.

⁵ Pacific Power Smart Grid Oregon Annual 2017 Report, p. 3.

- AMI costs and cost savings
- Reliability improvement and reconnection times
- Mitigating technology obsolescence risk
- Customer engagement
- Analysis of AMI data and data application (including but not limited to reliability and resource planning)
- Transition from AMI "capabilities" to "functionalities" and clearly defined milestones that would motivate this change

2017 Smart Grid Report Discussion: The Company has documented an extensive framework for tracking the above results in their 2017 Smart Grid Report. Table 4, "Tracking of AMI Savings," details the method and status of business case savings.⁶ A mechanism for reconnection time tracking will be established within the next 12 months, including a back-up process for reconnection failures.⁷ Mitigation of technology obsolescence is planned through vendor support, an open protocol network, and an AMI roadmap that includes hardware and software updates.⁸ AMI data is collected with a Meter Data Management System (MDMS) and processes it so that it can be used by other company applications.⁹ The transition from AMI "capabilities" to "functionalities" is detailed throughout the report through planning timelines and status reports.¹⁰ Staff appreciates the thorough response for AMI planning.

Although the Company details extensive methods and features of customer engagement, it does not specify a framework for tracking it.

Additionally, ODOE recommends that the Company perform financial modeling to prioritize future AMI action and describe the outcome of the financial models, comparing products and solutions among different applications. Staff appreciates ODOE's recommendation and agrees with it.

Staff Comments: Staff was satisfied with the Company's update on its AMI program.

Staff's 2017 Recommendation: PacifiCorp should continue to update the AMI Roadmap using the stated tracking methods. The Company should also specify a method for tracking customer engagement. The Company should also develop a system by the next SmartGrid report to perform and report on the impacts of

⁶ Pacific Power Smart Grid Oregon Annual 2017 Report, p. 15-18.

⁷ Pacific Power Smart Grid Oregon Annual 2017 Report, p. 19.

⁸ Pacific Power Smart Grid Oregon Annual 2017 Report, p. 19.

⁹ Pacific Power Smart Grid Oregon Annual 2017 Report, p. 11.

¹⁰ Pacific Power Smart Grid Oregon Annual 2017 Report, p. 8-19.

financial modeling on AMI action prioritization and solution comparison among different applications.

- **2016 Recommendation 3:** The Company should timely apprise the Commission of any new developments of new DLR projects.

2017 Smart Grid Report Discussion: In reply comments from 2016, the Company stated that high power flows on lines with DLR had diminished, and the thermal constraints on the lines no longer existed. The Company reported that it was no longer planning on reporting on the West-of-Populus line project because there is no data available. In the 2017 report, the Company states that there are no new projects, and there is no specific timeline for future DLR installations.

Staff Comments: Staff was satisfied with the Company's updates on DLR projects.

Staff's 2017 Recommendation: The Company has satisfied Staff's concern. As such, no further action by the Company is needed in this area.

- **2016 Recommendation 4:** Company to continue to apprise the Commission of the success, or lack thereof, of its remedial action scheme in the form of redundant relays.

2017 Smart Grid Report Discussion: In the 2017 report, the Company states that the remedial action scheme of installing redundant relays as an alternative to a combination of a thermal replicating relay and dynamic line rating is in-service and functioning as designed, and no future action is anticipated.

Staff Comments: Staff requested that the Company state in its reply comments under what circumstances a thermal replicating relay and/or dynamic line rating would provide benefits that outweigh the considerable cost difference in relation to a redundant relay scheme.

PacifiCorp Response to Staff: The Company responded to Staff that thermal replicating relays and dynamic line rating allow substantially more power across conductors than would otherwise be allowed with the traditional static line rating. PacifiCorp will install these systems when the benefits exceed the difference in cost and maintenance obligations. An example of this cost savings would be for transmission paths in high wind or solar generating areas to move more power than standard parameters would allow.

Staff's 2017 Recommendation: The Company has satisfied Staff's concern. As such, no further action by the Company is needed in this area.

- **2016 Recommendation 5:** The Company should provide a comprehensive narrative explaining its developments, or lack thereof, both past and present, with Peak Reliability and WECC and its decision to stop its transfer of PMU data to Peak Reliability. The Company should also follow through with its commitment to address ODOE's interest in seeing a discussion of lessons learned from identifying and analyzing system vulnerabilities and disturbances. ODOE was also interested in information in future smart grid reports on synchrophasor data being used to increase real-time situational awareness for transmission operations.

2017 Smart Grid Report Discussion: The Company detailed its decision to stop transfer of PMU data to Peak Reliability explaining that it has robust EMS and SCADA systems that offer real-time system data every two seconds to maintain situational awareness. PacifiCorp goes on to state that after several years in the program, the tools have yet to produce timely data that can be used to make real-time decisions for PacifiCorp's transmission operations. The program also faced interface and communication issues connecting to Peak Reliability. PacifiCorp's biggest lesson learned about working with PMU's was that quality data is difficult and costly to maintain. The Company states that it may restart the data stream to Peak Reliability in the future depending on tools available.¹¹

The Company plans to continue to collect PMU data at its central office, and has plans to expand PMU coverage as part of NERC standard MOD-033-1, and includes a table of locations identified for equipment in Appendix C. PacifiCorp also plans to install PMUs at large wind, hydro, and natural gas generating facilities. The scope and estimate are estimated to be complete in July 2017, and design and construction of the systems is planned for completion in 2018.¹²

Staff Comments: Staff requested that the Company update these plans in reply comments, and provide the scope and cost estimates for expanded PMU coverage, if available.

PacifiCorp Response to Staff: The Company responded to Staff that due to scope changes, the contractor bids were pushed to December 2017, so the final planned solution was not known at the time of publishing reply comments. The Company expects that streaming data from the systems will not begin until second quarter 2018.

¹¹ Pacific Power Smart Grid Oregon Annual 2017 Report, p. 20-22.

¹² Pacific Power Smart Grid Oregon Annual 2017 Report, p. 22-23.

The current scope for expanded coverage is SEL-2240 Axion PMU systems with protection class CT/PT modules, with each location time synced with a GPS clock. Total cost for the six completed installations was approximately \$150,000, or approximately \$25,000 per site. Four more sites, at the Company's bulk-electric-system-connected hydro plants, were undergoing installation at the time of reply comment publishing, with close to the same costs. PacifiCorp's complete project cost estimate for MOD-033/PRC-002 completion is \$7.3 million for both Pacific Power and Rocky Mountain Power service areas.

ODOE Comments: ODOE anticipates discussion regarding PacifiCorp's progress in hardening the technology and improvements that provide cost-effective methods to improve data quality.

ODOE expressed appreciation of PacifiCorp's experience gained with synchrophasor deployment and data management, which will enable compliance with the North American Electric Reliability Corporation (NERC) reliability standard MOD-033-1. ODOE requests additional information in future smart grid reports on the evaluation process used by the company in choosing deployment locations for the synchrophasors that will provide the data critical for compliance.

Staff's 2017 Recommendation: The Company should provide updates and results of its expanded PMU installation project and provide additional information in future smart grid reports on the evaluation process used by the company in choosing deployment locations for the synchrophasors that will provide the data critical for compliance.

- **2016 Recommendation 6:** Company to provide an update to its irrigation load control pilot and update the table on page 37 of the 2016 Smart Grid Report including Oregon data when it is available.

2017 Smart Grid Report Discussion: In 2017, no new customers will be added to the pilot program. However, one customer who signed up for the program in 2016 was not enabled until 2017. One two-hour event occurred since the last Smart Grid Report, on August 19, 2016, where 281 kW of available capacity was called on with 100% participation from the customers.

The Company did issue a Request for Proposals (RFP) in 2017 for load control services. Following the 2017 season, the Company will reassess the pilot to decide the future of the load control program.

Staff Comments: Staff requested that the Company state in its reply comments why no new customers will be added to the program in 2017. Staff also requested that the Company elaborate on the criteria that will be assessed in determining the future of the program, and how the RFP may or may not influence that assessment.

PacifiCorp Response to Staff: The Company responded to Staff that a key finding from 2016 program delivery was that there is a disconnect between the cost to deliver this small scale pilot and the existing pricing structure with the program vendor. Enrolling and enabling new customers generates additional administrative costs. Schedule 105 contains language to manage participation, which PacifiCorp used to manage 2017 costs, while additional delivery options were assessed. The program criteria that will be assessed in order for the program to move forward includes: grower acceptance, delivery costs, effectiveness of the current program design and availability of alternate program designs including ability to expand customer counts or geographically. Information from the RFP, specifically customer responses, will provide information relevant to one or more of these criteria through revealed preferences.

Staff's 2017 Recommendation: Staff requests that the Company provide results from its 2017 RFP for load control services in the next smart grid report, and what projects, if any, were installed. The Company should provide its assessment of the pilot in regards to the future of the load control program.

- **2016 Recommendation 7:** Company to provide a summary of its review to investigate linking distribution devices to its OMS and EMS.

2017 Smart Grid Report Discussion: The SCADA Monarch EMS was commissioned at PacifiCorp in April of 2016. The Company has determined that integrating the communicating faulted circuit indicators (CFCI) with the EMS is not the preferred solution. Rather, the Company believes the CFCI devices should be visible to the Company's Distribution Management System (DMS). The Company plans to upgrade its DMS to a newer version beginning in fall of 2018, which includes capability to integrate CFCI devices.¹³

Staff Comments: Staff requested that the Company state in its reply comments the feasibility of linking EMS and DMS systems and any advantages or disadvantages in doing so, and whether both systems follow IEC 61968 standards for information exchange.¹⁴

¹³ Pacific Power Smart Grid Oregon Annual 2017 Report, p. 37.

¹⁴ IEC 61968 is a series of standards under development that will define standards for information exchanges between electrical distribution systems.

PacifiCorp Response to Staff: The Company responded to Staff that linking the EMS and DMS systems is feasible, and detailed the process in doing so. The advantages of linking the systems include an established industry standard, which is existing and in use at PacifiCorp, and experience/knowledge presently within the Company. The potential disadvantage is network and hardware costs. The Company is currently reviewing IEC 61968 standards, and will define the Company's adherence to the standard at a time-to-be-determined.

Staff's 2017 Recommendation: PacifiCorp should update its progress of linking distributed devices to its OMS, EMS, DMS, and each other, if applicable, in its 2019 *Smart Grid Report*. The Company should also provide an overview of its adherence to the IEC 61968 standard.

- **2016 Recommendation 8:** The Company should provide an update on any field area network or communication functionality implementation.

2017 Smart Grid Report Discussion: The Company is deploying Fuse Saving devices that provide two-way communication on the distribution system. The devices provide rapid detection of system functionality, which reduces momentary interruptions.

The Company has two pilot projects in development: one project utilizing FuseSavers and CFCI, and one utilizing LineScope. If the pilot installations show positive results in the next 18-24 months, their installations will become standard practice. The Company is also observing data from newly upgraded substation devices and line reclosers for possible expansion to other locations.¹⁵

Staff Comments: Staff requested that the Company state in its reply comments what functionalities of LineScope the Company hopes to utilize, and what positive results would lead to installation being standard practice.

PacifiCorp Response to Staff: The Company responded to Staff that LineScope devices will be able to be used to act as localized SCADA devices, deployable within the network areas where operators are currently "blind" to how the system is operating, such as whether energy is flowing, fault operations may have occurred, or power quality waveforms are abnormal. This capability will allow the Company to identify anomalies and restore outages more quickly.

¹⁵ Pacific Power Smart Grid Oregon Annual 2017 Report, p. 39.

As the Company gains familiarity with LineScope devices, it is expected they will become the standard approach for adding visibility to the electrical transmission network, as cost schedules allow.

Staff's 2017 Recommendation: PacifiCorp should provide an update on any field area network or communication functionality implementation.

- **2016 Recommendation 9:** Company to work with Staff and interested stakeholders to schedule a CYME demonstration no later than April 30, 2017.

2017 Smart Grid Report Discussion: The Company provided a demonstration of CYME to Staff and stakeholders on March 28, 2017.

Staff Comments: Staff is satisfied with the Company's demonstration of CYME.

Staff's 2017 Recommendation: The Company has satisfied Staff's concern. As such, no further action by the Company is needed in this area.

- **2016 Recommendation 10:** The Company should continue to keep the Commission apprised of demand response developments in future smart grid reports.

2017 Smart Grid Report Discussion: The Company has assessed demand response potential in its 2017 Integrated Resource Plan (IRP). They engaged Applied Energy Group to investigate the potential for, and cost of, summer- and winter-focused demand response options, and compared the results to supply-side alternatives in the IRP. The study found that the first new need-based demand response resource occurs in 2028. No additional demand response projects are planned at this time.¹⁶

ODOE Comments: ODOE encourages the Company to maintain the customer engagement that is a part of the AMI deployment to assess interest and possible early uptake of DR to meet customer wants and needs. ODOE looks forward to discussions on market development involving high solar penetration in California contributing to higher levels of power trading between California and the Northwest, and how DR could change the resulting evening generation ramp.

Staff Comments: Staff believes demand response can play a positive role in enabling technology adoption and customer participation in SmartGrid initiatives.

Staff's 2017 Recommendation: PacifiCorp should continue to keep the Commission apprised of demand response developments in future smart grid

¹⁶ Pacific Power Smart Grid Oregon Annual 2017 Report, p. 42.

reports and should track market development for DR technology, customer demand for DR products and services, and assess the impact of DR on SmartGrid initiatives, including but not limited to renewables integration.

- **2016 Recommendation 11:** Company to provide DER analysis, including how it has utilized the transmission and distribution planning tool.

2017 Smart Grid Report Discussion: The Company deployed a DER screening tool for transmission and distribution planners to compare DERs to traditional solutions. The tool is an alternatives template created in a Berkshire Hathaway Energy cross-platform initiative that screens for solar, energy storage, and demand-side management feasibility and cost comparison. The Company is waiting for the conclusion of the RVOS (UM1716) and energy storage (UM1751) dockets to populate the tool with each technology's respective values. The Company has also partnered with ETO to determine whether customer-sited energy efficiency technologies have the ability to improve system operation during specific locational peak hours. The Company anticipates that future proposed system reinforcements will include DER solutions as part of system analysis.¹⁷

Staff Comments: Staff requested that the Company summarize exercises where DER was considered as an alternative to traditional solutions, the results of the exercises, and what hurdles, if any, there are to implementing the tool on a permanent basis.

PacifiCorp Response to Staff: The Company responded to Staff that PacifiCorp has implemented the Distributed Energy Resource (DER) screening tool on a permanent basis in the 10 year planning cycle for substation capacity improvements and distribution feeder projects over \$1 million. Substation capacity projects and larger distribution upgrade projects were focused for their higher chance of being effective investments. Smaller distribution projects experience diminishing returns since many costs do not substantially decline in smaller installations. In PacifiCorp's 2017 ten year planning analysis, 18 projects were screened using the DER tool. The Company screen for DER systems designs include solar, storage, solar plus storage, and demand-side managements. PacifiCorp has recently received updated energy storage prices from DNV GL and will incorporate this updated pricing into the DER tool.

ODOE Comments: ODOE expressed appreciation for the progress that PacifiCorp has made regarding energy storage, particularly the Company's engagement of a consultant to produce the Battery Energy Storage Study. ODOE looks forward to

¹⁷ Pacific Power Smart Grid Oregon Annual 2017 Report, at 44-45.

further evaluation of the eight separate values found in the Utility Applications and Value Streams, including potential to stack values. ODOE also requests a more detailed narrative in future smart grid reports on methods the company is utilizing to value energy storage and how these tools are working to streamline the evaluation process.

Staff's 2017 Recommendation: PacifiCorp should summarize any projects screened using the DER tool where DER projects were found to be a cost effective alternative to traditional solutions, and describe any DER projects that were or will be installed due to positive results. In addition, the Company should share in its next report the evaluation of the eight separate values found in the Utility Applications and Value streams, how those values may stack, and more information on the modeling the Company is using to value energy storage and any impacts from this modeling on project evaluation.

Additional Staff Comments

- *Staff Comments:* Staff requested that the Company state in its reply comments whether smart inverter communication and functionality has been explored for integration with the AMI, EMS, and/or DMS systems.

PacifiCorp Response to Staff: The Company responded to staff that Electric Power Research Institute and PacifiCorp are embarking on a project that will include smart inverter data capacity analysis and exploring best methods of communicating with smart inverters. This project will identify existing hurdles and indicate potential methods for integrating smart inverters into the Automated Metering Infrastructure (AMI) system, how best to accomplish the communication signal conversion likely necessary, and what functionality would be achievable with integration.

Staff's 2017 Recommendation: In its 2018 *Smart Grid Report*, PacifiCorp should summarize its findings of its smart inverter analysis project, and what projects or infrastructure involving smart inverters, if any, have been initialized.

- *Staff Comments:* Staff observed that one of the goals of the Company's Distribution Automation Feasibility study was to identify circuits containing critical loads and infrastructure.¹⁸ Staff requested that the Company state in its reply comments what distributed automation or other smart grid technology would increase reliability on these critical circuits, and what plans, if any, there are to implement such technology.

¹⁸ Pacific Power Smart Grid Oregon Annual 2017 Report, at 34.

PacifiCorp Response to Staff: The Company responded to Staff that the Distribution Automation Feasibility study identified some of the 35 circuits containing critical loads/infrastructure that would experience increased reliability from distribution automation. PacifiCorp is implementing an initial deployment of distribution automation in the Lincoln City area. This initial deployment location was chosen because it will be serviced by AMI and showed one of the highest potential improvements for a distribution automation system. If this initial deployment is successful, more locations serviced by AMI may benefit from a distribution automation scheme in the future. PacifiCorp will gather information from this initial deployment to inform any potential future deployments.

Staff Recommendation: The Company should provide detail of the distribution automation project in the Lincoln City area and any other deployments, as well as any results observed from project deployment in its next report.

- *Staff Comments:* Staff requested that the Company provide in its reply comments an update on the VaultGard Portland Low Voltage Secondary Network Project.

PacifiCorp Response to Staff: The Company responded to Staff that at the time of the 2017 Report, PacifiCorp was in the process of establishing an RFP to install a network monitoring system in the Portland underground network. The RFP process has been completed, and Eaton has been awarded the position of contractor. Eaton is subcontracting the construction through Christiansen Construction. PacifiCorp is currently performing engineering and material procurement for the project and exploring how to import the resulting data into EMS. The Company plans to install 75 new VaultGard systems as part of this project. The project in-service date is scheduled for November 1, 2018.

Staff Recommendation: The Company should provide an update in its next SmartGrid report and results of the network monitoring system installation, as well as plans for future deployment.

Conclusion

Recommendations

Staff recommends the Commission accept PacifiCorp's 2017 Smart Grid Report and acknowledge that it meets the requirements of Order No. 12-158. Staff also recommends that the Company take or implement the following actions for its 2018 Smart Grid Report:

1. PacifiCorp should continue to include a high-level table summary of all stakeholder informal comments and corresponding Company responses as an appendix in future smart grid reports.
2. PacifiCorp should continue to update the AMI Roadmap using the stated tracking methods. The Company should also specify a method for tracking customer engagement. The Company should also develop a system by the next SmartGrid report to perform and report on the impacts of financial modeling on AMI action prioritization and solution comparison among different applications.
3. The Company should provide updates and results of its expanded PMU installation project and provide additional information in future smart grid reports on the evaluation process used by the company in choosing deployment locations for the synchrophasors that will provide the data critical for compliance.
4. The Company should provide results from its 2017 RFP for load control services, and what projects, if any, were installed. The Company should provide its assessment of the pilot in regards to the future of the load control program.
5. PacifiCorp should update their progress of linking distributed devices to its OMS, EMS, DMS, and each other, if applicable, in its 2019 *Smart Grid Report*. The Company should also provide an overview of its adherence to the IEC 61968 standard.
6. PacifiCorp should provide an update on any field area network or communication functionality implementation.
7. PacifiCorp should continue to keep the Commission apprised of demand response developments in future smart grid reports and should track and update in its next report the market development for DR technology, customer demand for DR products and services, and assess the impact of DR on SmartGrid initiatives, including but not limited to renewables integration.
8. PacifiCorp should summarize any projects screened using the DER tool where DER projects were found to be a cost effective alternative to traditional solutions, and describe any DER projects that were or will be installed due to positive results. In addition, the Company should share in its next report the evaluation of the eight separate values found in the Utility Applications and Value streams, how those values may stack, and more information on the modeling the Company is using to value energy storage and any impacts from this modeling on project evaluation.

9. PacifiCorp should summarize its findings of its smart inverter analysis project, and what projects or infrastructure involving smart inverters, if any, have been initialized.
10. The Company should provide detail of the distribution automation project in the Lincoln City area and any other deployments, as well as any results observed from project deployment.
11. The Company should provide an update and results of the network monitoring system installation, as well as plans for future deployment.

PROPOSED COMMISSION MOTION:

Accept PacifiCorp's *2017 Smart Grid Report* along with Staff's recommendations set forth immediately above in the "Recommendations" part of this memorandum.