

PUBLIC UTILITY COMMISSION OF OREGON  
STAFF REPORT  
PUBLIC MEETING DATE: July 12, 2018

REGULAR  X  CONSENT \_\_\_\_\_ EFFECTIVE DATE \_\_\_\_\_ N/A \_\_\_\_\_

DATE: July 5, 2018

TO: Public Utility Commission

FROM: <sup>NRH</sup>  
Nadine Hanhan

THROUGH: <sup>J</sup> Jason Eisdorfer and <sup>JB</sup> JP Batmale

SUBJECT: IDAHO POWER COMPANY: (Docket No. UM 1675) Annual Smart Grid Report

**STAFF RECOMMENDATION:**

Staff recommends the Commission accept Idaho Power Company's ("Idaho Power" or "Company") *2017 Smart Grid Report* as having met the requirements of Order No. 12-158 established in Docket No. UM 1460. Staff also requests the Commission accept Staff recommendations described below for the *2019 Smart Grid Report*.

**DISCUSSION:**

Issue

Whether Idaho Power's *2017 Smart Grid Report* meets the reporting requirement set by Order No. 12-158.

Applicable Rule

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.

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

After a utility files a smart grid report, Staff and stakeholders have the opportunity to provide written comments, including recommendations on smart-grid investments and applications to be explored by the utility. The process culminates in a public meeting at which stakeholders and the utility have an opportunity for comment and Staff reports on whether the utility's smart grid report meets the requirements of Order No. 12-158 and recommends whether the Commission "accept" the filing. Commission acceptance of a smart grid report "signifies that the report meets the requirements of [Order No. 12-158] and any subsequent related orders."<sup>2</sup> If the Commission approves any of the recommendations made by Staff and stakeholders, "the Commission may require the utilities to address the recommendations in a subsequent report."<sup>3</sup>

### Analysis

#### *Staff's standard of review*

The standard of review utilized by Staff in its review of the utilities' smart grid reports subsequent to their initial reports is set forth below. Staff employed this same standard in reviewing the Company's *2016 Smart Grid Report*:

1. Whether the Company has met the guidelines set forth by the Commission in Order No. 12-158;<sup>4</sup> and
2. Whether the Company has addressed prior Commission-approved recommendations Order No. 17-076 and prior smart grid report reviews regarding potential smart grid investments, applications, and activities.

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<sup>1</sup> Commission Order No. 12-158, at page 4, Docket No. UM 1460, May 8, 2012.

<sup>2</sup> Commission Order No. 12-158, at pages 4-5, Docket No. UM 1460, May 8, 2012.

<sup>3</sup> Commission Order No. 12-158, at page 4, Docket No. UM 1460, May 8, 2012.

<sup>4</sup> This should also include incremental additions and updates of all elements of the first report. See Order No. 12-158, page 4.

*Background*

In March 2017, the Commission accepted Idaho Power's *2016 Smart Grid Report* as having met the requirements of Order No. 12-158.<sup>5</sup> At the same time, the Commission adopted Staff recommendations for Idaho Power's *2017 Smart Grid Report*.<sup>6</sup> The recommendations adopted by the Commission were as follows:

1. Continue to include Staff and stakeholder informal comments and corresponding Company responses in the 2017 Smart Grid Report.
2. Host additional workshops with Staff and other stakeholders for their input in finalizing the program design of the time-of-day (TOD) pilot.
3. Provide updated information on quantifiable benefits by populating the to-be-determined (TBD) fields in its Appendix H as applicable and continue to include any updates to the appendix in next year's report.
4. Provide the final Observability Study and explain the final implications of the study as it applies to phasor measurement units (PMU) installations, the cost of the PMU installations, and how those PMU installations will benefit the Idaho Power system.
5. In addition to providing updates on the Linear State Estimator (LSE) and the Real-Time Voltage Stability Monitoring and Control Assistant project (RT-VSMAC) via an appendix similar to that in the 2016 report, provide a narrative explaining the elements of the appendix and explain how its updates related to the Peak Reliability Synchrophasor Program (PRSP) are benefiting the Idaho Power system.
6. Track the progress of the customer relationship management (CRM) application and the customer relationship and billing (CR&B) upgrade and provide a robust narrative, complete with costs and benefits, describing how it intends to utilize CRM for personalized demand-side management (DSM) purposes beyond what is already available to customers. The Company should also provide a robust narrative describing how its Savings Center will or won't help achieve new DSM offerings or energy management abilities, if any.

On August 8, 2017, Idaho Power disseminated a draft version of the *2017 Smart Grid Report* and included a window of three weeks for stakeholder input. Idaho Power filed its fourth annual smart grid report on September 29, 2017—two days before the due date prescribed in Order No. 12-158.<sup>7</sup>

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<sup>5</sup> Commission Order No. 17-076, Docket No. UM 1675, March 2, 2017.

<sup>6</sup> Commission Order No. 17-076, Docket No. UM 1675, March 2, 2017.

<sup>7</sup> Commission Order No. 12-158, at page 4, Docket No. UM 1460, May 8, 2012.

After Idaho Power filed its *2017 Smart Grid Report*, Commission Staff filed comments on December 20, 2017, summarized in subsequent sections of this report. No other stakeholder filed comments. On January 23, 2018, Idaho Power filed Reply Comments.

Formerly, the utilities were required to file a smart grid report every year by dates specified in Order No. 12-158. It is important to note that Order No. 12-158 has been modified to reflect a requirement for biennial filings as opposed to annual filings. Staff had filed a motion on June 30, 2017, stating that an annual filing does not give the electric companies enough time to fully analyze longer-term impacts of smart grid investments. Consequently, this lack of long-term analysis results in few changes occurring in the reports from year to year. The Commission ordered on July 27, 2017 to require the utilities file a smart grid report every other year as opposed to every year.<sup>8</sup> Though the motion was filed in June 30, 2017, this did not impact the *2017 Smart Grid Report*. Because of the change in due dates, Idaho Power will not have to file another smart grid report until October 1, 2019.

#### *Discussion*

Below, Staff addresses Idaho Power's compliance with the recommendations for the *2017 Smart Grid Report* that the Commission adopted in Order No. 17-076. This discussion below includes a brief description of Staff's previous written comments and recommendations, Idaho Power's responses to the recommendations, and intervener comments where applicable. The discussion below also includes Staff's recommendations for the *2019 Smart Grid Report*.

Staff concludes that Idaho Power complied with the guidelines and reporting requirements set forth in Order No. 12-158. The *2017 Smart Grid Report* includes a discussion of each of the major elements identified by the Commission in that order and appropriately addresses the sub-issues of each element.

***Recommendation 1 for 2017 Report:*** *Idaho Power continue including stakeholder informal comments and the Company's respective responses as an appendix in future Smart Grid Reports.*

No party submitted comments on this recommendation, however Staff feels that this recommendation reinforces a policy of openness and transparency. Staff recommends keeping this recommendation going forward.

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<sup>8</sup> Commission Order No. 17-290.

**Recommendation No. 1 for 2019 Report:**

Idaho Power should continue to include Staff and stakeholder informal comments and corresponding Company responses in the *2019 Smart Grid Report*.

***Recommendation 2 for 2017 Report:*** Idaho Power work with Staff to investigate, design and implement a time-of-day (TOD) pilot that may include behavioral components that can be offered to Idaho Power residential customers if determined feasible.

*2017 Smart Grid Report Discussion:* The Company responded to this recommendation by hosting a series of phone conversations with Staff, outlining potential TOD structures and moving towards filing a completed program. Since the filing of the *2016 Smart Grid Report*, the Company has proposed two different approaches to a TOD pilot, both cost-based. One proposal included an \$8 service charge with differentials between peak and off-peak periods, and the other included a \$12 service charge. The Company's analysis showed that the higher service charge would result in higher differentials between the peak and off-peak periods. The Company indicated it would plan to complete the evaluation of feasibility of the TOD pilot by January 1, 2018.<sup>9</sup>

*Staff's December 2017 Comments:* Staff had expressed that the primary goal of time-of-use (TOU) or TOD programs is to shift daily electricity demand from peak to off-peak periods and relieve constraints on the Company's system.<sup>10</sup> While the Company had stated in a phone call that its small customer base in Oregon does not create a critical peak demand and thus customers may not receive much benefit from load shifting, Staff stated that it still believes that shifting peak loads and incenting customer behavioral changes through a TOD pilot would provide a valuable service to the Company's system. Staff recommended holding at least one more workshop to finalize a TOD program to present at the Special Public Meeting originally scheduled in March 2018.<sup>11</sup>

*Idaho Power Response:* In its Reply Comments, the Company stated that it held webinars and phone calls to work with Staff on a TOD pilot on February 14, 2017, August 30, 2017, and December 14, 2017. The Company intended to hold one more workshop with Staff before it filed its final proposal for the originally scheduled March 2018 Special Public Meeting.

*Staff Position:* Originally, the Company was supposed to have presented a final version of the TOD program in March 2018, but due to staffing challenges at the Commission, the finalization of the program was postponed. Staff did meet with Idaho Power for the

<sup>9</sup> Idaho Power *2017 Smart Grid Report*, p. 30.

<sup>10</sup> Staff Comments on *2017 Smart Grid Report*, p. 3.

<sup>11</sup> Staff Comments on *2017 Smart Grid Report*, pp. 3 and 4.

additional workshop via a phone call on April 26, 2018 to make additional suggestions for a TOD structure that reflected similarities to a recently proposed TOU program filed by Portland General Electric (PGE).

In Docket UE 319, which was the 2017 PGE rate case, Staff had proposed a residential TOU schedule that consisted of not applying transmission and distribution charges in the off-peak period. In testimony, Staff stated that this is cost-justified since transmission costs tend to be driven by coincident peak demands, which are inevitably during on-peak periods. In addition, distribution costs are driven by non-coincident peak demands, which may occur during a mid-peak period but not in an off-peak period. Thus, the schedule proposed by Staff in UE 319 allowed for avoiding transmission and distribution costs during off-peak periods.<sup>12</sup> The Commission adopted this voluntary TOU schedule for PGE.<sup>13</sup>

Idaho Power indicated that it would take Staff's proposal into consideration for the pilot. As of this filing, Idaho Power has not updated its proposal, but in an e-mail sent on June 26, 2018, the Company indicated that it has considered PGE's residential optional TOU rate design and has prepared a version to model that methodology as a potential proposal for its own pilot program. Staff appreciates this effort and looks forward to reviewing any additional proposals with the Company and other stakeholders. Staff is satisfied that the Company did its best to meet this recommendation.

***Recommendation No. 2 for 2019 Smart Grid Report:***

The Company should continue to work with Staff and include other stakeholders for input in finalizing the program design of the TOD pilot. Staff encourages the Company to complete its design of the TOD pilot taking into consideration the new suggestions by Staff in the April 2018 phone call. If determined feasible, Staff recommends that the Company file a tariff proposal with the Commission by December 31, 2018, and report any findings in the *2019 Smart Grid Report*.

***Recommendation No. 3 for 2017 Report:*** *Provide updated information on quantifiable benefits by populating the TBD fields in its Appendix H as applicable and continue to include any updates to the appendix in next year's report.*

*Idaho Power 2017 Report Discussion:* Idaho Power included the updated information in Appendix C<sup>14</sup> of the 2017 Smart Grid Report. The appendix included descriptions of

<sup>12</sup> UE 319. Staff/1400/Compton/7.

<sup>13</sup> Order No. 17-511.

<sup>14</sup> Appendix C of the *2017 Smart Grid Report* is a compilation of "Smart Grid Metrics" that include costs, benefits, goals, and descriptions of various projects Idaho Power has either completed or is in the process of investigating or completing.

various smart grid metrics and their statuses. The appendix includes practical and proactive projects that will be implemented for various purposes throughout the Company's system.

*Staff's December 2017 Comments:* Staff appreciated that the Company responded to Staff requests regarding quantifying benefits.

*Staff Position:* Staff is satisfied that the Company properly responded to Recommendation 3, however, Staff is interested in learning more about certain projects in the *2019 Smart Grid Report*.

In particular, Staff is interested in the following:

- Updates to the Jordan Valley Energy Storage Project and whether it was effective in reducing load on the transformer in the Jordan Valley Substation.
- Staff is interested in knowing more about the Transmission Situational Awareness Peak Reliability Hosted Advanced Application and comparing the cost of participation to the cost of a System Operating Limit exceedance. Page 14 of Appendix C indicates that the yearly cost of the program is \$75,000 with 4 potential exceedances avoided. Staff is interested in knowing how the Company knew what the cost of those exceedances were and how much the savings compare with investment in a yearly program. Staff is also interested in knowing how it was determined that an exceedance would occur, and whether this is a program the Company will participate in indefinitely.
- Whether or not the Company will update the EV charging impacts study.
- Staff is highly interested in the Photovoltaic and Feeder Peak Demand Alignment Pilot. Staff requests that the Company explain the metrics in the table on page 22 of Appendix C and produce the results and benefits of that pilot.
- Because a 2018 smart grid report is not required, Staff requests that the Company update the Direct Load Control Program for both 2017 and 2018 in the *2019 Smart Grid Report*.

***Recommendation No. 3 for 2019 Smart Grid Report:***  
Address the bullet points on page 7 of this Staff Report.

***Recommendation No. 4 for 2017 Report:*** Provide the final Observability Study and explain the final implications of the study as it applies to PMU installations, the cost of the PMU installations, and how those PMU installations will benefit the Idaho Power system.

*Idaho Power 2017 Smart Grid Report Discussion:* The Company submitted an Observability Study report prepared by V&R Energy Systems. The report can be found in Appendix D of the *2017 Smart Grid Report* and the analysis in the report seeks to identify portions of the system that are “observable,” where “observability” is defined as the ability to calculate voltage vectors at each node based on PMU measurements within a given network.<sup>15</sup> The purpose of the study was to identify the optimal placement of PMUs to improve the observability of the Idaho Power network.<sup>16</sup>

As a point of reference, a “phasor” is a measured quantity such as voltage or current that varies as a sine wave. In the American electric system, the nominal frequency of the sine wave is 60 cycles per second (Hz). A synchrophasor, in comparison, is a phasor that is time-stamped to a precise time reference. In order to record data on synchrophasors, the Company can install phasor measurement units (i.e., PMUs) to measure synchrophasors. By Idaho Power installing PMUs throughout its system, it can gain a more accurate understanding of the “state of affairs” of its system and achieve observability. PMUs are installed at substations to provide a synchrophasor measuring point.<sup>17</sup>

*Staff's December 2017 Comments:* Staff noted that while the Company identified 78 potential PMU locations, the Company only installed 44, allowing “partial” and not “full” observability. The Company identified a cost of \$1.5 million to install the additional 34 PMUs in locations identified in the study, but Staff noted that the Company did not indicate whether it was proceeding with installations at the remaining 34 locations. Staff requested that the Company indicate in its Reply Comments if it plans on installing the additional 34 PMUs and update the analysis of observability of the bulk energy system (BES) in a future report if the installation of all 78 PMUs will be completed. Staff was ultimately satisfied that the Company properly responded to Recommendation 4.

*Idaho Power Reply Comments:* Idaho Power explains that the focus of the Observability Study was the major generation plants and bulk transmission system. Idaho Power stated that it does not plan to install PMUs at all 78 identified locations to create full observability. However, the Company noted that it would continue to evaluate optimal

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<sup>15</sup> Idaho Power *2017 Smart Grid Report*, Appendix D, p. 11.

<sup>16</sup> Idaho Power *2016 Smart Grid Report*, Appendix I, p. 3-1.

<sup>17</sup> See <https://www.youtube.com/watch?v=uylGQ9ntLd0>.



PMU locations and report such additions through future Smart Grid reports.

*Staff Position:* Staff concludes the Company met the requirement in Recommendation 4 for the 2017 Smart Grid Report.

**Recommendation No. 4 for 2019 Smart Grid Report:** Continue to include updates, if any, on additional PMU installations and provide a summary of how the newly-installed PMUs have improved observability in Idaho Power's system.

**Recommendation No. 5 for 2017 Report:** *In addition to providing updates on the LSE and the RT-VSMAC via an appendix similar to that in the 2016 report, provide a narrative explaining the elements of the appendix and explain how its updates related to the PRSP are benefiting the Idaho Power system.*

*Idaho Power 2017 Smart Grid Report Discussion:* The information regarding the LSE was provided in the response to Recommendation 4, particularly in the Observability Study.<sup>18</sup> The Company provided the three most recent quarterly PRSP reports in Appendix E. The Company explained the elements within Appendix E, particularly the Region of Stability Existence (ROSE) tool, clarifying that the functionality and purpose of the ROSE tool is a real-time analysis tool that continuously monitors power system conditions by using PMU data.

*Staff's December 2017 Comments:* Staff summarized the Company's response to Recommendation 5 and noted that the PRSP's goal is to collaborate with transmission owners, transmission operators, and V&R Energy to develop, deploy, and test voltage stability software and LSE software. In its comments, Staff acknowledged the Company complied with the recommendation by providing the three most recent quarterly PRSP Project Status reports in Appendix E. Overall, Staff was satisfied that the Company properly responded to Recommendation 5.

*Staff Position:* Staff believes the Company met Recommendation 5 and has no further recommendations on this issue for the 2019 report.

**Recommendation No. 6 for 2017 Report:** *Track the progress of the customer relationship management (CRM) application and the customer relationship and billing (CR&B) upgrade and provide a robust narrative, complete with costs and benefits, describing how it intends to utilize CRM for personalized demand-side management (DSM) purposes beyond what is already available to customers. The Company should*

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<sup>18</sup> As a point of clarity, an LSE can be considered an advanced PMU application, hence addressing Recommendation 5.

*also provide a robust narrative describing how its Savings Center will or won't help achieve new DSM offerings or energy management abilities, if any.*

*Idaho Power 2017 Smart Grid Report Discussion:* The Company included basic statistics on its myAccount program, where customers log in to access their accounts, explaining that it updated the website in March 2017. The Company explained that its CRM system, integrated with CR&B, is to “manage and track customer interactions related to energy efficiency and other customer relations activities with the goal of increasing the effectiveness of Idaho Power’s program and service offerings.”<sup>19</sup>

*Staff's December 2017 Comments:* Staff requested that the Company provide an update on CRM January 2018 integration in its Special Public Meeting in March 2018 (now postponed to July 2018), as well as other project updates in the *2019 Smart Grid Report*. Overall, Staff was satisfied that the Company met this recommendation, but below Staff explains that it still has questions as to how the CRM interacts with energy efficiency efforts.

*Idaho Power Reply Comments:* The Company responded that CRM will provide Idaho Power benefits specific to improved communication and marketing tools and tactics. The Company also reiterated that the CRM integration was expected to occur in quarter 1 of 2018. In the Company’s January 2018 Reply Comments, it summarized its progress since filing the *2017 Smart Grid Report*, including a customer preference database, segmentation, campaign management, and enhanced communications. Idaho Power stated that it would provide an update on CRM integration in its presentation to the Commission at the special public meeting on March 19, 2018 (now postponed to July 12, 2018) and in its *2019 Smart Grid Report*.

*Staff Position:* Staff believes that Idaho Power complied with Recommendation No. 6 for the 2017 report, but agrees with the Company that additional reporting should be included in the 2019 report. Specifically, the Company indicated in its *2017 Smart Grid Report* that its CRM system could manage and track customer interactions related to energy efficiency.<sup>20</sup> Staff believes it would be useful to include a description of what these energy efficiency measures are and how the Company defines energy efficiency as it pertains to its CRM system. Staff is also interested in any data describing the difference in customer activity as a result of the new marketing tools and tactics, in addition to descriptions, with screenshots and pictures, of how the marketing tools and tactics impact customers.

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<sup>19</sup> Idaho Power *2017 Smart Grid Report*, p. 32.

<sup>20</sup> Idaho Power *2017 Smart Grid Report*, p. 20.

**Recommendation No. 5 for 2019 Smart Grid Report:** Include a description of what the energy efficiency measures related to CRM are and how the Company defines energy efficiency as it pertains to its CRM system. Describe the difference in customer activity as a result of the new marketing tools and tactics, in addition to descriptions, with screenshots and pictures, of how the marketing tools and tactics impact customers. The Company might consider including this as an appendix in the 2019 Report.

*Additional Notes*

With grid modernization becoming an increasing topic of interest, Staff agrees with the ideas presented as Idaho Power's vision for Smart Grid:

- Enhance customer participation and satisfaction;
- Accommodate generation/energy storage;
- Enable new products/services/markets;
- Improve power quality;
- Optimize asset efficiency;
- Anticipate and respond to disturbances; and
- Provide resilient operation/robustness.

Staff agrees that these are important components of grid modernization. Staff believes these are also consistent with the policy goals and objectives highlighted in Order No. 12-158. Some of these goals include increasing resiliency, enhancing efficiency of the grid, and facilitating new resource options.<sup>21</sup> As such, Staff encourages the Company to continue updating all projects in its 2017 report and continue to include an updated version of Appendix C in the 2019 Smart Grid Report to reflect these vision bullets. Staff believes that these, along with other projects in the report, are practical ways of modernizing the grid and provide a snapshot of the types of projects that might be considered in distribution system planning.

**Recommendation 6 for 2019 Smart Grid Report:** Continue updating all projects in Idaho Power's 2017 report and continue to include an updated version of Appendix C, with cost information, in the *2019 Smart Grid Report*.

Conclusion

Overall, Staff found the report to be a good showcase of how Idaho Power is advancing smart grid and grid modernization efforts.

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<sup>21</sup> Order No. 12-158, pp. 3 and 4.

*Recommendations*

Staff recommends the Commission accept Idaho Power's *2017 Smart Grid Report* and acknowledge that it meets the requirements of Order No. 12-158. Staff recommends that the Company take or implement the following actions for its *2019 Smart Grid Report*:

1. Idaho Power should continue to include Staff and stakeholder informal comments and corresponding Company responses in the *2017 Smart Grid Report*.
2. The Company should continue to work with Staff and include other stakeholders for input in finalizing the program design of the TOD pilot. Staff encourages the Company to complete its design of the TOD pilot taking into consideration the new suggestions by Staff in the April 2018 phone call. If determined feasible, Staff recommends that the Company file a tariff proposal with the Commission by December 31, 2018, and report any findings in the *2019 Smart Grid Report*.
3. Address the bullet points on page 7 of this Staff Report.
4. Continue to include updates, if any, on additional PMU installations and provide a summary of how the newly-installed PMUs have improved observability in Idaho Power's system.
5. Include a description of what the energy efficiency measures related to CRM are and how the Company defines energy efficiency as it pertains to its CRM system. Describe the difference in customer activity as a result of the new marketing tools and tactics, in addition to descriptions, with screenshots and pictures, of how the marketing tools and tactics impact customers. The Company might consider including this as an appendix in the 2019 Report.
6. Continue updating all projects in Idaho Power's 2017 report and continue to include an updated version of Appendix C, with cost information, in the *2019 Smart Grid Report*.

**PROPOSED COMMISSION MOTION:**

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