

PUBLIC UTILITY COMMISSION OF OREGON  
STAFF REPORT  
PUBLIC MEETING DATE: February 4, 2016

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

DATE: January 13, 2016

TO: Public Utility Commission

FROM: Michael Breish MB

JF JF Jan AA

THROUGH: Jason Eisdorfer and Aster Adams

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) *2015 Smart Grid Report* as having met the requirements of Order No. 12-158 established in Docket No. 1460. Staff also requests the Commission accept Staff recommendations described below for future Idaho Power *Smart Grid Reports*.

**DISCUSSION:**

The "Applicable law" and "Staff's standard of review" sections can be found in Appendix A of this report.

***Analysis***

Overview

On August 14, 2015, Idaho Power disseminated a draft version of the *2015 Smart Grid Report* to interested parties and included a window of three weeks for stakeholder input.<sup>1</sup> Staff offered informal comments to aid in the development of the report. Idaho Power filed its third Smart Grid Report on October 1, 2015, per Commission requirements found in Order No. 12-158.<sup>2</sup>

<sup>1</sup> Idaho Power sent the draft to recipients subscribing to the service lists for Docket Nos. UM 1460, UE 233, LC 63, and UM 1675.

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

The Citizens' Utility Board (CUB) and Oregon Department of Energy (ODOE) filed written comments. In its reply comments filed on December 18, 2015, Idaho Power addressed Staff's and the two interveners' comments.

Staff shares CUB's and ODOE's generally positive sentiments regarding the *2015 Smart Grid Report* as a whole. CUB characterized it as "a quality report with mostly appropriate updates, creative projects, and useful application of its technology," and ODOE stated the agency was "encouraged to read such a detailed, comprehensive report...."<sup>3</sup> Staff believes that Idaho Power's consistent practice in providing thorough information in both the Company's *2015 Smart Grid Report* and reply comments exceeds expectations and creates a transparent and productive reporting process. Efforts such as the inclusion of Staff's informal comments with the Company's responses as an appendix to the report and the continued improvements in the report's comprehensiveness reflect the Company's dedication to the production of a robust product and alignment with the Commission's current smart-grid objectives. Staff recommends that Idaho Power continue including stakeholder informal comments and the Company's respective responses as an appendix in future *Smart Grid Reports*. Staff looks forward to reviewing Idaho Power's future *Smart Grid Reports*.

***Idaho Power's response to recommendations adopted in Order No. 15-053***

In Order No. 15-013, the Commission concluded that Idaho Power's *2014 Smart Grid Report* met the requirements of Order No. 12-158 and accepted Staff's three recommendations for future *Smart Grid Reports*. Staff addresses Idaho Power's compliance with those recommendations below.

Requirement #1: Idaho Power provide a summarizing table of all research, development, and pilot projects, their respective descriptions, expected benefits and costs in future *Smart Grid Reports*.

Idaho Power provided the requested summarizing table as appendix D in the *2015 Smart Grid Report*. Idaho Power structured the table to match the four categories of smart-grid goals requested by the Commission in Order No. 12-158,<sup>4</sup> which also mirrors the full body of the report. In addition to the aesthetics of continuity, this intentional layout facilitates referencing and analysis of Idaho Power's current and planned smart-grid projects. The summaries are succinct but contain all essential information. The ability to compare costs with qualitative benefits enables a very rough concept of value that is crucial to the evaluation of the Company's nascent smart-grid efforts. Staff

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<sup>3</sup> CUB's 2015 comments, at page 1, Docket No. UM 1675, November 13, 2015; ODOE's 2015 comments, at page 1, Docket No. UM 1675, November 13, 2015.

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

appreciates the table, looks forward to utilizing it in future *Smart Grid Report* analyses, and notes that the topic of “expected benefits” will be discussed later in this report.

Requirement #2: Idaho Power report on the progress of its evaluation and solutions to the obstacles to the implementation of the [time of day] TOD pricing plans in the 2015 Smart Grid Report.

Prior to implementing any sort of TOD pricing structure for its Oregon customers, Idaho Power believes that seasonal pricing, aka time-of-use (TOU) rates, is an essential prerequisite to prepare customers for what Idaho Power believes are more complicated aspects of a TOD rate. Seasonal rates are the default structure for Idaho Power’s residential customers in Idaho, who also have the option of a TOD program through an available pilot. Oregon customers do not have seasonal rates despite the Company’s effort to introduce them through the previous several general rate cases. Idaho Power plans to propose seasonal rates again in the Company’s next Oregon rate case; however, it does not know when it will file such a case.

Idaho Power reports that given its belief that it is premature to implement TOD rates in Oregon, Idaho Power has complied with the requirement regarding TOD rates by analyzing rate design issues and technical capabilities of the Company’s billing system that would be needed in order to permit a larger application of TOD rates. Idaho Power reports that prior to offering TOD rates to all Oregon customers, the Company’s customer relations and billing (CR&B) system would have to be upgraded in order to process the larger amount of billing data. Idaho Power’s activities related to upgrades to the CR&B system are discussed later in this report.

To implement a TOD rate, Idaho Power would prefer to reflect the varied rates by deriving the rates from the variable power supply costs time block differentials. Idaho Power assessed the feasibility of TOD rates using this methodology.<sup>5</sup> The Company concluded from its analysis of the time differentiated cost of service data that “current differences in costs between peak and off-peak time blocks [in Oregon] are smaller than the differentials currently used in the optional residential TOD pilot plan in Idaho.”

**Initial Staff comments:** Staff disagreed with Idaho Power’s assertion that seasonal rates are a necessary prerequisite to TOD rates. Staff provided two counter points: First, results from the Company’s report on the performance of the TOD pilot available to Idaho residential customers indicate that seasonal rates do not necessarily lead to robust and successful participation or reduced load. Furthermore, Staff noted that the respective temporal and customer behavioral characteristics of Idaho Power’s TOU and

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<sup>5</sup> Idaho Power used hourly net power supply cost data provided in a study, *Time Differentiated Cost of Service Data Report* (COS Report), required by the Commission in Order No. 12-159.

TOD programs make them very different, nontraditional rate structures. Second, a number of other successful TOD rate deployments have occurred that were not preceded by seasonal rates.<sup>6</sup> Staff expressed concern that Idaho Power's hesitation to introduce TOD rates to Oregon customers "is depriving customers of benefits that are available from the [advanced metering infrastructure] AMI technology they have paid for."<sup>7</sup>

Staff suggested that, to accomplish the Company's effort in "designing fair and appropriate rate structures," pilots that have varying time blocks as well as incentive components like critical peak pricing or rebates be made available to residential customers. Pilots would not only optimize the Company's resources in researching effective TOD programs, but would also accommodate the current limits of the CR&B system. Staff's ultimate point was that "to attempt only one type of behavioral pricing or incentive program without exposing customers to other types of programs and the necessary education to ensure successful participation deprives customers of potential benefits and prevents [demand side management] DSM decisions informed by broad, deep and experimentally-backed research."<sup>8</sup>

**Idaho Power response:** Idaho Power reiterated its belief that customer exposure to seasonal rates is a prerequisite to deploying "more complicated, temporal-based pricing."<sup>9</sup> Stating "Idaho Power is not opposed to offering customers multiple rate options," the Company agreed with Staff's suggestion that offering multiple pilots to residential customers is an acceptable strategy to create more fair and appropriate rate structures.<sup>10</sup> Any new rate option must have a supporting reason however, and the Company underscores its effort to design rates reflecting the cost-of-service (COS) to customers. After referencing the COS Report that demonstrates the TOD pilot has greater rate differentials than the differentials between peak and off-peak time costs, the Company stated "Idaho Power does not currently see a strong cost-based need for a TOD rate offering to Oregon customers at this time."<sup>11</sup> Idaho Power concludes with its offer of support to work with Staff to investigate a TOD offering in Oregon.

Idaho Power provided detailed information regarding the issues limiting the capabilities of the current CR&B system. Idaho Power explained that the differences in the way the metering and CR&B systems are designed and configured create the limitations. Were

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<sup>6</sup> Lakeland Electric Company, Minnesota Power, PPL to name a few.

<sup>7</sup> Staff's 2015 comments, at page 3, Docket No. UM 1675, November 13, 2015.

<sup>8</sup> Ibid.

<sup>9</sup> Idaho Power's reply comments, at page 2, Docket No. UM 1675, December 18, 2015.

<sup>10</sup> Ibid.

<sup>11</sup> Ibid.

the Company to expand TOD on a large scale, new validation and estimation processes would be required in order to accommodate the change.

**Staff position and recommendation:** After reviewing Idaho Power's existing rates for Oregon customers, existing TOU rates for Idaho customers, the TOD pilot currently available to Idaho customers, the COS Report, and TOD programs offered by other utilities, Staff believes that there are potential benefits from TOD rates. The on-peak window, which ranges from 1:00PM to 9:00PM, utilized by the available TOD pilot is one of the major features that Staff would like to investigate further. Other TOD pilots across the country, many of which produce successful results, feature on-peak and mid-peak windows that are far smaller in range.<sup>12</sup> Figures 3a and 4a in the COS Report illustrate that narrower windows could produce greater participation and larger load drops.<sup>13</sup> Additionally, smaller windows comport with many energy decisions that customers can make to reduce load, whereas a large window may alienate customers from making meaningful behavioral changes. Another reason to offer a TOD pilot is the potential participation enhancement of financial incentives like critical peak pricing or rewards. These are but a couple aspects of TOD pilots that Staff would like to investigate with Idaho Power in order to provide the Company opportunities to reduce peak generation and customers opportunities to save money.

Staff appreciates Idaho Power's responsiveness in exploring this matter and the Company's willingness to work together to design and execute fairer and more appropriate rate structures for customers. *Staff recommends that Idaho Power work with Staff to research and implement a TOD pilot that can be offered to Idaho Power residential customers.*

Requirement #3: Idaho Power quantify the benefits expected from all smart grid programs and identify when the benefits will flow to its customers.

Idaho Power included a table found as Appendix E in *2015 Smart Grid Report* that attempts to comply with this recommendation. For each current and planned smart grid project, Idaho Power identifies which of the four overarching smart grid goals that the Commission listed in Order No. 12-158 applies.<sup>14</sup> Benefits are noted as either "current benefits" or "future benefits."

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<sup>12</sup> Interim Report on Customer Acceptance, Retention, and Response to Time-Based Rates from the Consumer Behavior Studies, US Department of Energy, June, 2015.

<sup>13</sup> Idaho Power's August 8, 2012 *Time Differentiated Cost of Service Data Report*, at pages 5 and 6, (Docket No. RE 89).

<sup>14</sup> See the subheadings of each list of bulleted items found on pages 3-4 of Commission Order No. 12-158.

**Initial Staff comments:** Staff noted that, though the provided chart is helpful in comparing and identifying respective benefits, it ultimately fails to comply with the explicit language of the recommendation, i.e., “*quantify* the benefits.” Staff recognized that some of Idaho Power’s smart-grid projects may not lend themselves to readily available quantifiable benefits for reasons such as “projects that are not yet implemented or where the full scope of a project’s impacts on the system or customers is not yet ascertained.”<sup>15</sup> Staff expressed its belief that certain projects, such as the Company’s AMI system or available transfer capacity (ATC) tool, have quantifiable benefits that can be shared.

Staff requested the Company provide sufficient explanation to why Appendix E contains no quantitative data as well as any “anticipated, forecasted, and/or actual *quantifiable* benefits where available.”<sup>16</sup>

**Idaho Power response:** In determining the best way to respond to recommendation #3, Idaho Power sought a solution that presented benefits across all projects in “a consistent manner.”<sup>17</sup> Idaho Power stated that many projects’ quantifiable benefits were not available and that the most appropriate recourse was to report “*the kind* of benefits expected (emphasis added).”<sup>18</sup> Idaho Power concludes by stating the Company will evaluate available data for each smart-grid project and include quantifiable benefits if available in future *Smart Grid Reports*. These benefits may be “in the form of dollars, of metrics achieved, or some other values.”<sup>19</sup>

**Staff position and recommendation:** Idaho Power’s alternative response to Staff’s and the Commission’s request for quantifiable data is not unique; all three electric utilities have struggled with reporting quantifiable benefits data in their respective smart grid dockets. Staff supports Idaho Power’s efforts for future *Smart Grid Reports*. However, to avoid missed expectations and unnecessary comments, Staff believes that a workshop prior to the filing of the Company’s annual *Smart Grid Report* may prove beneficial.

*Staff recommends Idaho Power work with Staff and stakeholders to hold a workshop prior to the annual submission of the Company’s Smart Grid Report where Staff and stakeholders can review and offer suggestions to any quantifiable benefits the Company plans to provide.*

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<sup>15</sup> Staff’s 2015 comments, at page 4, Docket No. UM 1675, November 13, 2015.

<sup>16</sup> Ibid.

<sup>17</sup> Idaho Power’s reply comments, at page 4, Docket No. UM 1675,

<sup>18</sup> Ibid.

<sup>19</sup> Ibid.

### ***Additional Comments***

Smart-grid topics that do not result in a Staff recommendation can be found under Appendix B of this report. Smart-grid topics for which Staff has recommendations are discussed on the following page.

#### Transmission Situational Awareness

##### A. Methodology for Installing Phasor Measurement Units (PMU)

**Staff comments:** Because PMUs are integral to three separate transmission situational awareness efforts, Staff inquired “how, where, and when” PMUs are installed.<sup>20</sup>

**Idaho Power response:** Initially, Idaho Power planned to install PMUs to enable visibility on all 230kV and greater transmission lines – Idaho Power intends to have a PMU at every pertinent transmission station. All power plants with a capacity of 20MW and greater will also eventually receive PMUs, which will enable the Company to validate model parameters for control equipment. Idaho Power provided a table that shows the PMU installation priority; six PMUs are slated to be installed by May 2017; five of which are for various generation stations and one of which is for the Transmission Situational Awareness Oscillation Monitoring Pilot.<sup>21</sup> Idaho Power is also working with ODOE to deliver “a new voltage stability tool and a linear state estimator (LSE),” the latter of which will ultimately require additional PMUs in order to provide improved observability.<sup>22</sup>

**Staff recommendation:** *Idaho Power provide the observability methodology document as an attachment to the ensuing Smart Grid Report.*

##### B. Various Applications for Data Streaming and Archiving

**Staff comments:** Under the “Transmission Situational Awareness Oscillation Monitoring Pilot” section, Idaho Power stated a reliable mechanism was still needed for “streaming and archiving the data [from the related PMUs] to be used in the various applications.”<sup>23</sup> Staff requested clarification on the meaning of “various applications.”

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<sup>20</sup> Phasor measurement units are intelligent electronic devices that can be installed at locations throughout the grid, principally substations and generating units, in order to produce time-stamped voltage measurements and current phasors. Data from multiple PMUs can be inputted into a situational awareness application, or state estimator, that enables real-time measurement of the state of parts or the whole electrical system.

<sup>21</sup> Ibid, at page 5.

<sup>22</sup> Ibid.

<sup>23</sup> Idaho Power's 2015 Smart Grid Report, at page 7, Docket No. UM 1667, October 1, 2015.

**Idaho Power response:** Idaho Power provided a comprehensive list of the applications that utilize PMU data on pages five and six of the Company's reply comments.

**Staff position and recommendation:** Staff appreciates Idaho Power's inclusion of the details that accompany each use; the information enables greater insight for Staff into the Company's diverse smart grid efforts. *Staff recommends the Company provide updates on the LSE and the real-time voltage stability monitoring and control (RT-VSMAC) applications in future Smart Grid Reports when available.*

#### Advanced Metering Infrastructure

**Staff comments:** Staff acknowledged that Idaho Power's AMI represents some of the core smart grid goals and principles of both the Commission and the Company. Staff asked a number of questions about current and planned efforts. First, Staff asked what reliability data is available from smart meters in order to increase transparency and quantification of smart-grid benefits. Second, Staff asserted certain AMI functions, including outage detection and remote connect/disconnect, can be quantified and subsequently reported in a manner that lends itself to benefit calculations. Finally, Staff inquired about any plans to upgrade its current AMI.

**Idaho Power response:** Idaho Power acknowledged the foundational significance of AMI in Idaho Power's smart grid. Idaho Power cannot obtain any reliability data from its AMI meters; they can only "detect single-phase outages on three-phase circuits, scope reported outages, and verify restoration."<sup>24</sup> Idaho Power contends that quantification of smart grid benefits is difficult because many benefits of AMI features are more qualitative in nature. Cost reductions in operations and maintenance are quantifiable as is the automated connect/disconnect capability. Though cost-savings data for the latter was preliminary at the time of publishing the *2015 Smart Grid Report*, Idaho Power estimates that, in the long term, about \$45 can be saved every time a connect or disconnect occurs. Approximately 14,500 remote connect/disconnect meters have been installed at sites with frequent connect/disconnect requests. Idaho Power notes that due to customer contact requirements, remote connect/disconnect has not been deployed in Oregon and doing so in the future is uncertain because of Oregon Administrative Rule (OAR) 860-021-0405(9)(b)(B).<sup>25</sup> The Company currently has no plans to upgrade the existing AMI system.

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<sup>24</sup> Idaho Power's 2015 reply comments, at page 7, Docket No. UM 1675, December 18, 2015.

<sup>25</sup> This OAR requires a utility to make a "good-faith" effort to contact the customer with remote disconnection capabilities at least three days prior to the proposed disconnect date. If no contact is made, the utility must contact the customer at least twice a day for three consecutive days prior to the proposed disconnect date. One call must occur between the hours of 8:00AM and 5:00PM, and the other between the hours of 6:00PM and 8:00PM. If an answering machine is present, the utility must leave a message at the end of each day informing the customer of the proposed disconnect.



**Staff position and recommendation:** Staff recognizes the technical limitations posed by the current AMI. However, from this recognition emerge possibilities that Staff hopes can turn into actionable work that reflects benefits for Idaho Power customers. Staff would like to work with Idaho Power to determine the savings, both in cost and customer downtime, the AMI's ability to detect, scope, and report have created in comparison to the previous metering system. Such a determination also facilitates the opportunity for Idaho Power to begin reporting savings from connect/disconnect operations. Regarding the possibility of remote connect/disconnect capability in Oregon given the governing OAR; Staff is open to discussing solutions with the Company. *Staff recommends Idaho Power work with Staff to determine possible AMI-related annual cost-saving metrics for future Smart Grid Reports.*

#### Behavioral Demand Response (BDR)

**Staff comments:** A BDR pilot is very likely to provide Idaho Power customers an additional opportunity to participate in DSM activities, providing valuable experience and energy and cost savings, while also enabling the Company to gain valuable data on "customer participation, load changes, and insights into increasing and sustaining customer participation in DSM programs."<sup>26</sup> Because of these promising opportunities, Staff asked the Company to assess the possibility of implementing a BDR pilot.

**Idaho Power response:** The Company noted that two of its three currently operating demand response (DR) programs, Flex Peak Program and Irrigation Peak Rewards Program, have behavioral components that enable customers to choose how much of a load drop they contribute. Idaho Power also outlines its compliance with the 2013 settlement agreement produced in Docket No. UM 1653 and approved by the Commission in Order No. 13-482. Idaho Power states it has no plans to offer a BDR program in addition to the DR programs it already maintains as a result of the stipulation agreement.

**Staff position and recommendation:** Staff believes the language of the stipulation agreement or the continued maintenance of the DR programs does not preclude the Company from implementing additional DR pilots. Staff believes the explicit language of ¶ 4(c) of the stipulation leaves space for DR pilots to be explored.<sup>27</sup> Ultimately, Staff is fearful the notion that no new DR in any capacity can be explored until a peak-hour capacity deficit occurs will deprive customers of possible cost-effective energy savings.

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<sup>26</sup> Staff's 2015 comments, at page 5, Docket No. UM 1675, November 13, 2015.

<sup>27</sup> "This Agreement applies only to Idaho Power's Demand Response *Programs*, and the concepts are not applicable to any of the Company's other DSM Programs. (emphasis added)"

Idaho Power currently forecasts the first peak-hour capacity deficit will occur in 2026, which leaves ten years of DR innovation inaccessible to customers.<sup>28</sup>

*Staff recommends Idaho Power work with Staff and stakeholders to design and deploy a BDR pilot.*

#### myAccount

**Staff comments:** Staff asked the Company if customer usage data could be leveraged to provide more detailed recommendations, including personalized ones using data analysis, through the myAccount web service. Staff opined that the service holds potential for future DSM customer targeting.

**CUB comments:** CUB values the outreach efforts and associated thoughtful details the Company is employing, especially myAccount.

**ODOE comments:** ODOE commended Idaho Power's efforts to enable customers' access of near real-time energy consumption information.

**Idaho Power response:** Using the "Savings Center" feature of myAccount, Idaho Power offers savings opportunities "based on a customer's individual home attributes and energy use." Means such as weatherization, installation of efficient shower heads or LED lamps also include an estimate of associated costs.

**Staff position and recommendation:** Customers benefit from greater and easier access to their usage data, a Commission smart-grid goal, which Idaho Power demonstrates it is committed to facilitating. Idaho Power noted that the Company currently does not possess the means to proactively engage customers or personalize thresholds, but features like myAccount in conjunction with the stored customer data are ripe for personalized DSM savings. *Staff recommends in the 2016 Smart Grid Report, Idaho Power identify possible opportunities for future DSM personalization features in myAccount and what capabilities are needed to deploy them.*

#### Solar End-of-Feeder Project

**Staff comments:** Staff asked what the Company's methodology and criteria for physical and economic feasibility are for a solar end-of-feeder project to occur.

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<sup>28</sup> Idaho Power Company's 2015 Integrated Resource Plan, Appendix C, at page 61, Docket No. LC 63), June 1, 2015.

**ODOE comments:** ODOE states a solar PV/battery storage combination has the potential to be “a cost-effective solution to distribution system operational challenges like low voltage.”<sup>29</sup> ODOE requested the Company consider recognizing solar PV integration benefits beyond those that apply to the distribution system.

**Idaho Power response:** The Company provided a helpful table on pages 14 and 15 of its reply comments.

**Staff position and recommendation:** Staff notes that Idaho Power did not respond directly to ODOE’s request to acknowledge benefits beyond the distribution system benefits. Staff recommends that in *the 2016 Smart Grid Report*, Idaho Power describe how solar end-of-feeder project benefits other than to infrastructure deferred upgrades can be captured.

Customer Relationship Management (CRM)/Integrated Demand Response Resource Control (IDRRC)

**CUB comments:** Noting that neither of these projects were updated from the *2014 Smart Grid Report*, CUB asked for further information. Additionally, CUB used this topic as an opportunity to recommend the Company include a brief update on every smart grid project, even if it’s a brief clarification on an unchanged status.

**ODOE comments:** ODOE recommends “the Company use the [CRM] system to target potential demand response and voluntary TOU customers.”<sup>30</sup>

**Idaho Power’s response:** Idaho Power addressed CUB’s request with a sufficient status update that notes the complexity of both projects due to their technical nature. The CR&B system first must be upgraded with a corresponding package before the CRM, which is a module of the CR&B, can be installed. As mentioned earlier, the CR&B system is scheduled for an upgrade in 2016; Idaho Power hopes to install a CRM in late 2016 or early 2017 barring IT resource constraints. The IDRRC’s first phase should arrive prior to the 2016 DR season, but underscores the iterative nature of the installation that will ultimately lead to full functionality at an undetermined point in the future.

Idaho Power addresses ODOE in a more confined manner, simply stating that they cannot target customers because the Company does not have a CRM system in place.

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<sup>29</sup> ODOE’s 2015 comments, at page 2, Docket No. UM 1675, November 13<sup>th</sup>, 2015.

<sup>30</sup> *Ibid.*, at pages 3-4.

**Staff position and recommendation:** Staff appreciates the status update and looks forward to Idaho Power's decision to provide updates on all smart grid projects in future reports regardless of progress achieved. Staff recognizes the potential of DSM integration that underlies ODOE's request. Staff recommends that in the *2016 Smart Grid Report*, Idaho Power discuss how technologies like the CRM system can assist the Company in identifying customers who are optimal for specific DSM programs.

### **Staff Recommendations**

*Staff recommends the Commission accept Idaho Power's 2015 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:*

1. Idaho Power continue including stakeholder informal comments and the Company's respective responses as an appendix in future *Smart Grid Reports*.
2. Idaho Power work with Staff to research and implement a TOD pilot that can be offered to Idaho Power residential customers.
3. Idaho Power work with Staff and stakeholders to hold a workshop prior to the annual submission of the Company's *Smart Grid Report* where Staff and stakeholders can review and offer suggestions to any quantifiable benefits the Company plans to provide.
4. Idaho Power provide the observability methodology document as an attachment to the ensuing *Smart Grid Report*.
5. Idaho Power provide updates on the LSE and the real-time voltage stability monitoring and control (RT-VSMAC) applications in future *Smart Grid Reports*.
6. Idaho Power work with Staff to determine possible AMI-related annual cost-saving metrics for future smart grid reports.
7. Idaho Power work with Staff and stakeholders to design and deploy a BDR pilot.
8. In the *2016 Smart Grid Report*, Idaho Power identify possible opportunities for future DSM personalization features in myAccount and what capabilities are needed to deploy them.

9. In *the 2016 Smart Grid Report*, Idaho Power describe how solar end-of-feeder project benefits other than to infrastructure deferred upgrades can be captured.
10. In *the 2016 Smart Grid Report*, Idaho Power discuss how technologies like the CRM system can assist the Company in identifying customers who are prime for specific DSM programs.

**PROPOSED COMMISSION MOTION:**

Idaho Power's 2015 *Smart Grid Report* be accepted with Staff's recommendations set forth immediately above in the "Recommendations" part of this memorandum.

Idaho Power 2015 Smart Grid Report

## Appendix A

### ***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.

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>31</sup> On an on-going basis, the Commission provides for comment by Staff and parties including recommendations on smart-grid investments and applications to be explored by the utilities. If the Commission approves any of these recommendations, "the Commission may require the utilities to address the recommendations in a subsequent report."<sup>32</sup>

The Commission accepted Idaho Power's second *Smart Grid Report* as having met the requirements of Order No. 12-158.<sup>33</sup> At the same time, in its order accepting the 2014 Report, Order No. 15-053, the Commission adopted the list of Staff recommendations for Idaho Power's *2015 Smart Grid Report*.<sup>34</sup> The recommendations adopted by the Commission were as follows:

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<sup>31</sup> Commission Order No. 12-158, at page 4, Docket No. UM 1460, May 8, 2012.

<sup>32</sup> *Ibid.*

<sup>33</sup> Commission Order No. 15-053, Docket No. UM 1675, February 23, 2015.

<sup>34</sup> *Ibid.*, Appendix A, at page 11.

1. Idaho Power provide a summarizing table of all research, development, and pilot projects, their respective descriptions, expected benefits and costs in future *Smart Grid Reports*.
2. Idaho Power report on the progress of its evaluation and solutions to the obstacles to the implementation of the [time-of-day] TOD pricing plans in the *2015 Smart Grid Report*.
3. Idaho Power quantify the benefits expected from all smart grid programs and identify when the benefits will flow to its customers.

***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 Idaho Power's *2015 Smart Grid Report*:

1. Whether the Company met the guidelines set forth by the Commission in Order No. 12-158,<sup>35</sup> and
2. Whether the Company addressed prior Commission-approved recommendations from prior smart grid report reviews regarding potential smart grid investments and applications.

As clarified in greater detail in this Staff report, Idaho Power complied with the recommendations in Order No. 15-053 to an extent. Idaho Power's report is consistent with the Commission's reporting requirements outlined in Order No. 12-158.

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<sup>35</sup> This should also include incremental additions and updates of all elements of the first report. See Order No. 12-158 at 4.

## Appendix B

### Transmission Situational Awareness

#### C. Voltage Stability Monitoring Pilot (VSMP)

**Staff comments:** During the evaluation of the VSMP, the Company determined that additional PMUs were needed in order to have sufficient data “needed for the methodology used in the voltage stability monitoring algorithm.”<sup>36</sup> Staff requested the Company to elaborate on the additional PMUs needed and under what circumstances they would be installed.

**Idaho Power response:** The Company estimates that in order for the algorithm to run properly, a significant number of PMUs would be need to be installed because each bus requires “remote and local PMU measurements on all of the lines connecting to... [the] bus.”<sup>37</sup> Idaho Power states that the VSMP might be possible in the future as more PMUs are added to the system, but the Company is focusing efforts on the RT-VSMAC that will offer similar functionality.

**Staff position and recommendation:** None

#### D. Peak Reliability (PR) Application Integration

**Staff comments:** Staff asked if Idaho Power has any plans to integrate the PR application with either the Company’s ongoing conservation voltage reduction (CVR) plans or a distribution management system (DMS). Staff also asked how PR was being integrated into current Company operations.

**CUB comments:** Beyond the cost information included in the *2015 Smart Grid Report*, CUB found little changed from the Company’s *2014 Smart Grid Report* regarding the PR application. CUB requested more information on the Company’s utilization of the PR Coordinator Hosted Advanced Application (HAA).

**ODOE comments:** ODOE offered its supports for the Company’s overall transmission situational efforts and encouraged the Company to continue installing PMUs at optimal locations. ODOE looks forward to “updates on confidence in the quality and usefulness of the PMU data, functionality of the tools under development, and acceptance by the system operators” in the *2016 Smart Grid Report*.<sup>38</sup>

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<sup>36</sup> Ibid.

<sup>37</sup> Idaho Power’s 2015 reply comments, at page 6, Docket No. UM 1675, December 18, 2015.

<sup>38</sup> ODOE’s 2015 comments, at page 2, Docket No. UM 1675, November 13, 2015.



**Idaho Power response:** In regard to Staff's comments, Idaho Power stated that integration is not planned; CVR and a DMS are for distribution operations, whereas the PR HAA is for transmission operations. To address CUB's request, Idaho Power detailed a number of ways the Company utilizes the HAA, including real-time operations and contingency analyses, modeling and verify mitigation actions and for some next-day study planning. Idaho Power anticipates the HAA will be used more frequently in operational planning as additional tools are incorporated into Company operations and planning.

**Staff position and recommendation:** None

#### Direct Load Control

**Staff comments:** Staff, referencing changing participation and performance in the Company's three DR programs, asked Idaho Power if opportunities to increase performance and participation existed beyond what already has been discussed in the *2015 Smart Grid Report* and the Energy Efficiency Advisory Group meetings

**ODOE comments:** ODOE encourages the Company to continue utilizing the existing, and possibly other, DR programs.

**Idaho Power response:** Under terms of the 2013 stipulation approved by the Commission in Order No. 13-482, Idaho Power must only maintain DR program participation at 2012 levels. Idaho Power's 2015 IRP shows that the first significant peak-hour capacity deficit does not occur until 2026.<sup>39</sup> Any discussions or efforts underway are to maintain participation levels, not increase them.

**Staff position and recommendation:** Staff is currently evaluating the *Flex Peak Program End-of-Season Annual Report* as well as the data provided in the annual DSM filing. Based on Staff's findings and ensuing conversations with the Company, Staff will pursue meaningful action either in future *Smart Grid Reports* or EEAGs to ensure customers are receiving the maximum benefits of the exiting DR programs under the terms of the stipulation agreement.

#### Customer Data

**Staff comments:** Staff asked Idaho Power if third parties are permitted access to customer data in order to enhance existing operations or assist customers in saving energy, and if not, what is preventing the Company from doing so?

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<sup>39</sup> Ibid.

**Idaho Power response:** Idaho Power has an existing contract with a third party that provides "individual home energy usage information" for the Company's Savings Center feature, which compares an individual home's energy profile with an average home in Idaho Power's service territory.<sup>40</sup> Idaho Power then details the consumer protection measures it enforces with any third party.

**Staff position and recommendation:** Staff is currently reviewing other utilities practices regarding the utilization of customer data for DSM and other smart-grid purposes. Any findings and suggestions will be discussed in ensuing *Smart Grid Reports*.

#### Online Resource Portfolio Mix Tool

**ODOE comments:** ODOE stated that the tool, available on the Company's website to all, "puts Idaho Power at the forefront in making information about generation resources available to utility customers."<sup>41</sup> In addition to including the tool on customers' myAccount page, ODOE also requested that Idaho Power implement a feature using hourly consumption data that enables customers to observe how their consumption pattern matches system resource supply.

**Idaho Power response:** Idaho Power appreciates ODOE's remarks and states the Company will take ODOE's suggestion into consideration when further upgrades are made to the myAccount system. An upgrade is launching this month that will match the desktop experience to the mobile myAccount setup, which Idaho Power believes will lead to greater customer engagement, and subsequently more education about energy consumption based on mobile usage research.

**Staff position and recommendation:** Staff first notes that indeed this tool is very exciting, promising and informative. Second, ODOE's request highlights Staff's belief that many opportunities to improve customer education and participation in their electricity consumption by means of data utilization are within reach. Staff will note this use of customer data as it researches opportunities for Idaho Power to better utilize customer data.

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<sup>40</sup> Idaho Power's 2015 reply comments, at page 10, Docket No. UM 1675, December 18, 2015.

<sup>41</sup> ODOE's 2015 comments, at page 3, Docket No. UM 1675, November 13, 2015.

### Meter Data Management System (MDMS)

**Staff comments:** Upgrade to the MDMS will “increase potential customer billing and pricing options” according to Idaho Power.<sup>42</sup> Staff inquired whether the “pricing options” include TOU or other DSM opportunities.

**Idaho Power response:** Idaho Power succinctly stated “the upgrade will provide enhanced validation for net metering and improved automated data validation of hourly data that will support expansion of TOU rates based on hourly energy use data.”<sup>43</sup>

**Staff position and recommendation:** None.

### Substation Fiber-Based Protection and Control Pilot

**Staff comments:** Staff inquired into Idaho Power’s plans regarding this technology were it to prove successful: will the Company retrofit existing substations and do any opportunities exist for the Company to monetize any of its investments?

**CUB comments:** CUB appreciates “the forward-thinking attitude and inclusion of the costs of the project.”

**Idaho Power response:** Currently, the Company does not plan to retrofit existing stations, but future stations may qualify. Idaho Power may revisit the possibility of retrofitting existing stations in the future, but only after a cost/benefit analysis is thoroughly completed. Because no intellectual property rights are involved with the pilot, Idaho Power has no plans to monetize its investments. However, the Company notes that the pilot will most likely move forward and provide benefits in the form of cost savings, additional protection and flexibility.

**Staff position and recommendation:** None

### Automated Volt/VAr Management System (VVMS) Pilot

**Staff comments:** Given that the Company’s CVR effort is newly proceeding in the “CVR Enhancements Project” and the VVMS pilot is now slated to initiate in 2016 or later, Staff sought clarification as to whether the possibility of VVMS-controlled CVR, as mentioned in the *2014 Smart Grid Report*, was still a possibility.

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<sup>42</sup> Idaho Power’s *2015 Smart Grid Report*, at page 35, Docket No. UM 1675, October 1, 2015.

<sup>43</sup> Idaho Power’s 2015 reply comments, at pages 11-12, Docket No. UM 1675, December 18, 2015.

**Idaho Power response:** Not only does Idaho Power believe that a role still exists for CVR in VVMS operations, but lessons learned from the CVR Enhancements Project are “directly applicable to Volt/VAr control and if done properly, they are one and the same.”<sup>44</sup> Idaho Power’s VMMS pilot was delayed until 2016 in order to allow the Company to develop a general Volt/VAr management strategy. This general strategy will be informed by the “InterTechnology Control Project,” which will produce a coordination strategy of the actions of distribution system voltage control elements installed on a single feeder or set of feeders. Idaho Power is currently determining which feeder(s) will receive the voltage control elements for the InterTechnology Control Project. These same feeders will most likely host the VVMS pilot, which is now slated to start in 2017 or 2018.

**Staff position and recommendation:** None.

#### PV and Feeder Peak Demand Alignment Pilot

**Staff comments:** Noting the benefits that the utility, PV owners and non-owners can achieve with the application of the results of this pilot, Staff asked how Idaho Power plans to use this data moving forward. One example Staff offered was the opportunity for Idaho Power to offer guidance to residential customers so that benefits, in the form of grid operations or planning, are optimized.

**ODOE comments:** ODOE congratulated Idaho Power on the innovation behind this pilot that is characterized by large value given the low upfront costs. Encouraged by the preliminary finding that PV-systems can be better oriented to peak-load following during summer afternoons, ODOE stated it’s looking forward to future findings that include better alignment between PV output and feeder peaks.

**Idaho Power response:** Idaho Power is already utilizing the pilot data in a number of ways. First, the Company has implemented a data set “in modeling software to perform generation interconnection studies of utility-scale PV systems.”<sup>45</sup> The data is also being used in resource planning and in a collaboration with Sandia National Labs on the Variability and Global Horizontal Irradiance and Plane of Array conversion studies. Idaho Power wrote a paper titled *A Method for Determining the Relationship between Solar Irradiance and Distribution Feeder Peak Loading* that has been accepted for the 2016 Institute of Electrical and Electronics Engineers Power Engineering Society Transmission & Distribution Conference & Exposition. The paper will be included in the *2016 Smart Grid Report*.

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<sup>44</sup> Idaho Power’s 2015 reply comments, at page 13, Docket No. UM 1675, December 18<sup>th</sup>, 2015.

<sup>45</sup> Idaho Power 2015 reply comments, at page 16, Docket No. UM 1675, December 18, 2015.

Though Idaho Power currently has no plans for guiding customers' or developers' solar PV installations, the Company acknowledges the possibility of recommending preferred orientations that would optimize reduction of feeder peak loads.

**Staff position and recommendation:** None.

#### Customer Satisfaction and Engagement

**Staff comments:** After slight decreases in customer satisfaction in 2013 and 2014, Idaho Power identified areas of improvement in a review of that time period. Staff requested identification of *all* areas of improvement discovered during this assessment. Staff also asked if Idaho Power is incorporating other utilities' outreach and education efforts "in order to enhance customer participation in Company DSM programs."<sup>46</sup>

**Idaho Power response:** Idaho Power identified two broad areas of improvement: 1) "establishing itself as an energy advisor that customers can go to for energy-related issues and questions," and 2) "the opportunity to inform and educate customers on the Company's efforts to consider all customers in planning for future energy needs."<sup>47</sup> Both areas are being addressed by increased communications with customers through digital and traditional means. Quarterly surveys are also conducted, with any dissatisfaction being addressed by a plan of action if Idaho Power deems it appropriate. Overall, Idaho Power has maintained consistent customer satisfaction.

Idaho Power is a member of a number of national organizations that provide the Company with information on best practices, including customer outreach and education.<sup>48</sup> Other sources of utility efforts include conferences, meetings and the Company's Energy Efficiency Advisory Group (EEAG). The Company's own outreach efforts, including the Residential Energy Efficiency Education Initiative and the Easy Savings Program, connect a range of customers with tailored programming and information.<sup>49</sup>

**Staff position and recommendation:** Idaho Power's multi-faceted efforts in outreach and education efforts are encouraging. Staff is participating in a workshop series with Portland General Electric (PGE) to review other utilities' outreach and education efforts

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<sup>46</sup> Staff's 2015 comments, at page 7, Docket No. UM 1675, November 13, 2015.

<sup>47</sup> Idaho Power's 2015 reply comments, at page 17, Docket No. UM 1675, December 18, 2015.

<sup>48</sup> Organizations include Esource, J.D. Power and Associates, Chartwell, Consortium for Energy Efficiency, American Council for an Energy Efficient Economy, the Regional Technical Forum, and the Association of Energy Services Professionals.

<sup>49</sup> See pages 18-19 of Idaho Power's 2015 reply comments for more information on these internal efforts.

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in an effort to identify best practices and determine how PGE can incorporate them if appropriate. Staff will bring any discoveries from this process to Idaho Power's EEAG.