

PUBLIC UTILITY COMMISSION OF OREGON  
STAFF REPORT  
PUBLIC MEETING DATE: December 10, 2013

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

DATE: December 3, 2013

TO: Public Utility Commission

FROM: Juliet Johnson and Paul Rossow <sup>PR</sup>

THROUGH: Jason Eisdorfer, Maury Galbraith, 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 (IPC, Idaho Power, or Company) 2013 Smart Grid Report filing as having met the requirements of Order No. 12-158 established in UM 1460. Staff also recommends the Commission accept the recommendations described below for future Idaho Power Smart Grid Reports.

**DISCUSSION:**

***Background***

Order No. 12-158 in UM 1460 established reporting requirements for electric utilities in Oregon related to smart grid. Utilities are required, at a minimum, to include the following main elements in their Smart Grid Annual Reports:

1. Smart Grid Strategy, Goals, and Objectives.
2. Status of Smart Grid Investments, including transmission, distribution networks, customer information, distributed resources and demand-side management and general business enhancements. In addition, the Company must describe smart grid investments and applications it plans to undertake over the next five years and at a minimum address how the planned investments fit in the utility's Integrated Resource Plan (IRP).

3. Smart grid Opportunities and Constraints over the next five years including evaluations and assessments of technologies the utility plans to undertake and a description of any pilots.

4. Targeted Evaluations pursuant to Commission-approved stakeholder recommendations.

5. Related Activities.

Order No. 12-158 lists Commission Guidelines for Utility Action when considering evaluating and implementing potential smart grid investments. OPUC Order No. 12-158 at 6-7.

The following is the standard of review Staff plans to use for annual Smart Grid Reports, as set out in Order No. 12-158 at 4-5:

1. Whether the Company met the guidelines set forth by the Commission in Order No. 12-158; and
2. Whether the Company addressed prior Commission-approved recommendations from previous year's Smart Grid Report reviews regarding potential smart grid investments and applications.

The Company followed closely the format and categories spelled out in UM 1460 which made the report easy to evaluate and compare to the corresponding guidelines.

In accordance with the requirements spelled out in Order No. 12-158 III.B.b. the Company solicited stakeholder input on what should be covered in the smart grid report. IPC took out newspaper ads and sent emails to potential interested parties. Staff finds this is sufficient to satisfy the requirements of III.B.b. However, Staff notes that in the future, it may be beneficial for the Company to circulate a draft version of the report at the same time they solicit comments.

In the report, the Company spells out smart grid strategy goals and objectives as required by Order No. 12-158 at III.C.1. Staff finds that the Commission's policy goals and objectives align well with the Company's smart grid vision and the seven major smart grid characteristics noted by Idaho Power.

In general, Staff is pleased with the progress Idaho Power is making toward implementing a smarter grid for its customers. Staff is satisfied that Idaho Power met the guidelines set forth in Commission Order No. 12-158. Because this is IPC's first

Smart Grid Report filing, there are no previously agreed to Commission-approved recommendations from prior reports.

### ***Description of the Filing***

In the report at page 7, IPC lays out the Company's smart grid vision, which consists of the following seven major characteristics:

1. Enhance customer participation and satisfaction
2. Accommodate generation/storage
3. Enable new products/services/markets
4. Improve power quality
5. Optimize asset efficiency
6. Anticipate and respond to disturbances
7. Provide resilient operation/robustness

The Company's strategy for realizing the smart grid vision focuses on investments in:

- Operations
- Customer Systems
- Advanced Metering Infrastructure

The Company laid out the status of their current and future smart grid investments. The Company conveniently summarized all activities in a table, located in Appendix B of the report. Staff asked the Company to update the table with columns to indicate specific expected start and completion dates for all initiatives qualified as ongoing, under development, under evaluation, planned, or in pilot status. That table is attached to this memo as **Attachment A**.

### ***Summary of Party Comments***

The Citizens Utility Board (CUB) provided written comments on IPC's 2013 Smart Grid Report. CUB indicated they were generally pleased with Idaho Power's work, stating that the report shows the Company has taken serious efforts in its smart grid projects and assessments. CUB indicated they were particularly pleased that Idaho Power:

- Has monitored its transmission substations for susceptibility to geomagnetic induced currents
- Is attempting to shift the way it predicts wind speed and direction
- Has provided updates on Advanced Metering Infrastructure (AMI) benefits

- Intends on proceeding with caution relative to Conservation Voltage Reduction (CVR) before extending CVR to other territories

CUB also points out that the Company provided a detailed and preliminary update of time-of-use program and notes that at present the Company shows no indication of a mandatory time-of-use pricing program. CUB also appreciated that Idaho Power kept a large portion of its report non-confidential so other utilities can take advantage of their innovations.

### **Staff Comments**

Staff concludes that Idaho Power has met the requirements of Commission Order No. 12-158. Staff offers the following additional comments.

#### Conservation Voltage Reduction

Staff recognizes that Idaho Power has been an industry leader when it comes to CVR, in large part due to their participation in the Northwest Energy Efficiency Alliance (NEEA) Distribution Efficiency Initiative (DEI) pilot. In Docket LC 53, the Company's 2011 IRP, they spelled out very specific and aggressive targets for moving forward with CVR based on the results of the NEEA pilot. The pilot revealed that reducing voltage by 3 percent resulted in savings of approximately 1.5 to 2.5 percent in KWh and approximately 1.8 to 2.6 percent in kW.<sup>1</sup>

As a result, Staff was disappointed to learn that IPC's "CVR study and implementation was discontinued" due to obstacles identified, specifically:<sup>2</sup>

- An inability to measure actual peak reduction and energy savings;
- The applied CVR factors may not be representative of substation load;
- An inability to measure the actual customer voltage during peak load or abnormal system configuration; and
- The increased operational complexity when switching loads between CVR and non-CVR feeders.

The Company indicates that it will undergo the following steps and after completion of these steps, it will proceed with CVR study and implementation where cost effective. The steps Idaho Power proposes are:

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<sup>1</sup> LC 53 - Page 5 of Idaho Power Company's Reply to Staff's Comments and Recommendations.

<sup>2</sup> See the Company's response to Staff's Data Requests No. 5&6 in this proceeding UM 1675.

- Validate the benefit, reduced peak demand and energy savings, of the existing CVR program before expanding it beyond the initial area;
- Analyze two existing CVR substations load characteristics, quantify CVR effects on the load and calculate their CVR factors;
- Determine CVR factors for each geographic region of the service area;
- Pilot new volt/VAr technologies that improve feeder voltage profiles;
- Proceed with the volt/VAr optimization research project; and
- Complete the existing CVR analysis by 2016 in preparation for extending the CVR measures to other Idaho Power facilities.

Unlike the Company's detailed and rigorous criteria for evaluating where it is cost effective to install AMI meters, Staff does not have a clear sense of what criteria would be used to decide whether to move forward with additional CVR projects.

Staff recommends that in the next Smart Grid report, IPC provide an update and schedule for current CVR projects and provide details about what criteria it will use to decide whether or not to move forward with additional CVR projects.

#### Advanced Metering Infrastructure

In the original filing, the Company indicated that AMI-enabled smart meters were installed for 99 percent of metered retail service customers. The remaining one percent of metered retail service customers did not receive smart meters, because Idaho Power's business case requirements were not met. Staff sent data requests asking the Company what the business case requirements were at the time of implementation and asked the Company to provide supporting calculations for why it was determined not to install smart meters for one percent of customers. Staff also asked the Company for results of an updated analysis that was completed in 2012 where the Company again looked at the costs versus benefits of continuing to use non-smart meters in certain areas.

The Company responded that the original business case requirement was to have an overall positive return on investment and breakeven point for the investment compared to savings in approximately seven years. Based on distribution substation technology costs of \$150,000 per distribution bus section, stations with less than 300 customers were not cost effective.<sup>3</sup> The Company reported that the results of their updated 2012 analysis indicated that it was still not cost-effective to deploy AMI on small distribution

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<sup>3</sup> See Idaho Power's response to Staff Data Request 1 in this Docket UM 1675.

substations and, therefore, the Company has no plan for deploying AMI to customers served by non-AMI substations at this time.<sup>4</sup>

Staff appreciates the systematic approach the Company used and is continuing to use to evaluate cost effectiveness of expanding the use of AMI and smart meters. Staff supports the result of the analysis and the decision to continue to use manual meter reading in specific areas where AMI continues to be cost prohibitive.

### Time Variable Pricing

The Company is currently conducting a Time Variable Pricing (TVP) pricing pilot called the Time of Day (TOD) pilot in its Idaho service territory. The Company indicates that based on the results of the pilot, they may expand the pilot to other areas. In the Company's response to staff data request 9, they indicate that they are analyzing the TOD pilot to determine participant behavior modifications and revenue impact.

Staff asked the Company what results from the TOU pilot would lead to the Company to expand TVP offerings to the rest of its customers in Idaho and Oregon. The Company indicated in its response to Staff data request 9 that "Idaho Power has not established a predetermined list of criteria under which it would propose expansion of TVP." The Company also says that "results of this analysis are expected mid-year 2014. A decision on the next steps for the TOD pricing plan will be made after the completion of the study."

Also in response to Staff data request 9, the Company indicates they continue to evaluate the potential value of offering a critical peak pricing rate plan and a seasonal pricing structure for Oregon residential customers. Staff did not ask about and the Company did not provide any details about the schedule for evaluating critical peak pricing or season pricing for Oregon customers.

Appendix D-5 of the 2013 Smart Grid Report contains an AMI "Phase II" Project Completion Report. In the background section of that report, the Company explains how in response to the 2000 and 2001 "energy crisis" the Idaho Public Utility Commission ordered Idaho Power to analyze the potential benefits of implementing TOU rates. The conclusion was that although traditional TOU rates based on fixed season and time of day would provide little benefit, dynamic time variant rates triggered based on critical system or market conditions, could be effective in reducing peak system load, but these would require AMI meters.<sup>5</sup>

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<sup>4</sup> See Idaho Power's response to Staff Data Request 2 in this Docket UM 1675.

<sup>5</sup> Idaho Power 2013 Smart Grid Report, Appendix D-5, page 1

The Phase II AMI Project Completion Report also indicates that one of the technical requirements of the AMI Project Objectives was to be able to retrieve hourly energy consumption data in support of implementing time-variant rates based on hourly consumption data.

Staff recommends that in the next Smart Grid Report, Idaho Power provide:

- a) An update on the current TOD pilot;
- b) A timeline for analyzing the critical peak pricing and seasonal pricing structure pilots; and
- c) Information on how all three pilots will be evaluated and what participant behavior modifications and revenue impact outcomes would lead to decisions to expand pilot or not.

#### Outage Management System

The Company describes in the report how the current Outage Management System (OMS) is being replaced and how the replacement was put on hold in the fall of 2012. Staff sent a data request asking for a timeline and schedule for replacing the OMS and having the OMS and AMI integrated as was originally intended to occur in 2013. In their response to Staff's data requests, the Company explains that since 2010 when Idaho Power initiated the OMS replacement project, significant technology advancements have occurred. Idaho Power plans to begin a new project in 2014 to evaluate technological advancements and develop a roadmap toward a more comprehensive distribution management system, which will include an OMS. The new OMS would be in place by the end of 2016. The Company explains that in the interim, Idaho Power has developed and implemented integration between the existing AMI and the existing OMS, which allows the Company to use the pinging capability of the AMI to identify potential outages. Currently, this is a partially manual process.

Staff appreciates the Company taking a fresh look at OMS starting in 2014 and in the meantime using an existing partially manual integrated AMI and OMS system.

#### ***Staff Recommendations:***

Staff recommends the Commission accept Idaho Power's 2013 Smart Grid report as having met the requirements of Order No. 12-158 established in UM 1460. Staff also recommends the Commission accept the following recommendations:

- 1) The Company should circulate a draft version of future smart grid reports at the same time they solicit comments and prior to filing at the Commission.

- 2) In the next Smart Grid report, IPC provide an update and timeline for current analysis of CVR. The Company should also detail the criteria it will use to gauge success and expandability of CVR efforts.
- 3) In the next Smart Grid Report, Idaho Power provide:
  - a) An update on the current TOD pilot;
  - b) A timeline for analyzing the critical peak pricing and seasonal pricing structure pilots; and
  - c) Criteria for how all three pilots will be evaluated and what participant behavior modifications and revenue impact outcomes would lead to decisions to expand pilot or not.

**PROPOSED COMMISSION MOTION:**

Idaho Power's 2013 Smart Grid Report is accepted with Staff's recommendations.



**STATUS OF SMART GRID INITIATIVES**

II. STATUS OF CURRENT SMART-GRID INVESTMENTS	STATUS	START DATE	COMPLETION
<b>A. Transmission Network and Operations Enhancements</b>			
Transmission Situational Awareness Project	Complete/In Use		
Available Transmission Capacity Calculation Tool	In Use/Under Development	2011	2014
Dynamic Line Rating Pilot	Pilot/Under Development	2010	2014
<b>B. Substation and Distribution Network and Operations Enhancements</b>			
Transmission Transformer Geomagnetic Disturbance Monitoring	In Use/Under Development	2012	2014
Conservation Voltage Reduction	In Use/Under Development	2006	2016
<b>C. Customer Information and Demand-Side Management Enhancements</b>			
Advanced Metering Infrastructure	Complete/In Use		
Customer Information System Replacement	Complete/In Use		
Time Variant Pricing	Pilot	2012	2014
Energy Use Advising Tool	Complete/In Use		
Direct Load Control			
A/C Cool Credit	Ongoing	See Ongoing note below	
Irrigation Load Control	Ongoing	See Ongoing note below	
Irrigation Peak Rewards	Ongoing	See Ongoing note below	
<b>D. Distributed Resource and Renewable Resource Enhancements</b>			
Renewable Resources: Renewable Integration Tool (RTI)	Complete/In Use		
Current Distributed Resources on Idaho Power System	Ongoing	See Ongoing note below	
<b>E. General Business Enhancements</b>			
Advanced Metering Infrastructure Communications	Complete/In Use		
Enterprise Data Warehouse	Under Development	Already Started	TBD

III. FUTURE SMART-GRID INVESTMENTS	STATUS	START DATE	COMPLETION
<b>A. Transmission Network and Operations Enhancements</b>			
Transmission Situational Awareness Oscillation Monitoring Pilot	Pilot/Under Development	2012	2015
Transmission Situational Awareness Voltage Stability Monitoring Pilot	Pilot/Under Development	2012	2015
<b>B. Substation and Distribution Network and Operations Enhancements</b>			
Substation Fiber-Based Protection and Control Pilot	Pilot/Under Development	2013	2015
<b>C. Customer Information and Demand-Side Management Enhancements</b>			
Customer Relationship Management	Planned	Tentative Q2-2015	Q4-2015
<b>D. Distributed Resource and Renewable Resource Enhancements</b>			
Renewable Integration Tool (RIT); potential future projects	Under Evaluation	TBD	TBD
<b>E. General Business Enhancements</b>			
Implementation of Automated Connect/Disconnect through the AMI System	Planned	1/1/2014	3/1/2015
Implement Additional AMI Outage Scoping and Restoration Confirmation Functionality	Under Evaluation	Q3-2014	Q2-2016
Ability of the AMI System to Control Line Devices	Under Evaluation	TBD	TBD
Replace the Existing Outage Management System	Planned	Q3-2014	Q2-2016
Upgrade the Mobile Workforce Management System	Planned	2015	2015
<b>IV. SMART-GRID OPPORTUNITIES AND CONSTRAINTS</b>			
<b>A. Transmission Network and Operations Enhancements</b>			
Hourly Customer Usage Data	Ongoing	See Ongoing note below	
Future Time Variant Pricing	Under Evaluation	TBD	TBD
Home Area Network	Under Evaluation	TBD	TBD
<b>B. Evaluations and Assessments of Smart-Grid Technologies</b>			
PV and Feeder Peak Demand Alignment Pilot	Pilot/Under Development	2012	2014
Volt/Var Management Technology Evaluation	Under Evaluation	2013	2014

C. General Customer Outreach and Education	STATUS	START DATE	COMPLETION
Events	Ongoing	See Ongoing note below	
Communications	Ongoing	See Ongoing note below	
Electric Vehicles	Ongoing	See Ongoing note below	

**Key:**

- **Complete/In Use** – a project that was completed and is now being used
- **Ongoing** – did not necessarily start as a project but rather as a general effort or program and is now being used or offered to customers on an ongoing basis. Under this designation projects have already started and have no completion date because they are ongoing.
- **Under Development** – for projects that are not complete at this time
- **Pilot** – a limited scope installation to prove the technology application in the Idaho Power system
- **Planned** – initiative that is included in five-year plan and budget
- **Under Evaluation** – the technology or concept is being evaluated and is not at the planned or pilot stage yet
- **TBD** – to be determined