**AVISTA CORP.**

### RESPONSE TO REQUEST FOR INFORMATION

# JURISDICTION: WASHINGTON DATE PREPARED: 06/14/2015

# CASE NO.: UE-150204 & UG-150205 WITNESS: Don Kopczynski

# REQUESTER: Public Counsel/Energy Project RESPONDER: Linda Gervais

# TYPE: Data Request DEPT: State & Federal Regulation

# REQUEST NO.: PC/EP – 001 TELEPHONE: (509) 495-4975

EMAIL: linda.gervais@avistacorp.com

**REQUEST:**

Provide any analysis of the costs, benefits, performance of the technology, and/or customer participation and results done by the Company for internal purposes concerning the smart grid demonstration project conducted in Pullman, WA since its inception. In your response, include any internal reports and documents relating to the operation and implementation of the smart grid demonstration project in Pullman, WA provided to senior managers and above since the inception of the pilot.

**RESPONSE:**

Please also see Avista’s response to PC/EP\_001C which is **Confidential per Protective Order in UTC Dockets UE-150204 and UG-150205**.

Avista’s Smart Grid Demonstration Project in Pullman, WA, was an integrated part of the Pacific Northwest Smart Grid Demonstration Project that was funded, in part, by the U.S. Department of Energy (DOE) and was managed by Battelle Memorial Institute, Pacific Northwest Division (Battelle). The demonstration project covered the period 2010 through early 2015, and included a one-half year design phase, two-year construction phase, two-year observation phase, and a one-half year closeout phase. The objectives of the Pullman Smart Grid project included the following:

1. **Increased system efficiency:** To install and test the performance of measures designed to achieve energy savings through Conservation Voltage Reduction (CVR). In the past, these savings were estimated based on engineering assumptions, but with the new system, we were able to measure increments of energy savings based on a lower voltage set point within the Company’s tariffed voltage range.[[1]](#footnote-1)/[[2]](#footnote-2)
2. **Increased operational efficiency:** Notification of power outage on our system from both the transformer and the advanced meter allowed the Company to estimate the improvement in restoration efficiency enabled by this new system.
3. **Greater system reliability and decreased restoration times:** To use a new Distribution Management System to minimize the effect of an outage by remotely monitoring the current on a feeder, determining the location of an outage, isolating the outage, and automatically switching the system to minimize the customers affected by the outage.
4. **Lower consumer energy usage through customer participation:** The advanced meters were used to provide interval data to customers to determine the initial rates of customer adoption and to estimate the energy savings they achieved.
5. **Automated response of the system to regional needs:** To test the ability and effectiveness of a grid wide system to execute coordinated tools to achieve energy savings and optimization through demand response, distributed generation and storage, and distribution automation.
6. **Incorporation of distributed resources not owned by the utility:** To install and test a system to collect information on the amount and availability of distributed generation resources to call upon during a major outage event.

As part of the Northwest Smart Grid Demonstration Project, Avista was required to provide much of the data it collected during the project to Battelle, for analysis, interpretation, and reporting. The final project reports being developed by Battelle are currently in the drafting and review stage and the Company will supplement this request once the final reports are complete and available.

While Avista played a role in collecting data designed to meet the overarching objectives of the Northwest Project, the Company did use data from the Pullman project in its own studies to meet several of the above objectives. Considerable material documenting the objectives, analysis, and results of these studies have been provided in detail in response to discovery in the Company’s 2012 General Rate Case in Docket Nos. UE-120436 and UG-120437. These materials are provided as PC/EP\_DR\_001 Attachment A and PC/EP\_DR\_001C Confidential Attachment A. Due to the size of the responses from the 2012 case, they are being provided with this response on compact disc (CD).

Pursuant to objective number one, above, the Company implemented and tested the operational performance of a CVR system. The performance of this system was independently evaluated by Navigant Consulting, who determined that it was a cost effective program, and that its performance exceeded its initial design expectations. A copy of the final report prepared by Navigant is provided as PC/EP\_DR\_001 Attachment B.

Another focus, related to objective number three, above, was to test the performance of a “smart circuits” system designed to automate much of the switching among distribution circuits that is required to quickly restore service to customers during an outage. Avista was pleased with the performance of its system and the results for the reduction in outage duration time, and other reliability indices, are presented in the table below:

**Table No. 1**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Reliability Improvements** | **2013** | **2014** | **Year to Date 2015** | **Life to Date** |
| Customer Minutes Saved | 271,320 | 82,016 | 0 | 353,336 |
| Customer Sustained Outages Avoided | 1,785 | 2,985 | 0 | 4,770 |
| Total Area Customer Outage Minutes | 721,027 | 1,623,079 | 45,045 | 2,389,151 |
| Total Area Customer Outages | 4,033 | 18,614 | 230 | 22,877 |
| SAIFI Improvement | 30.68% | 13.82% | 0.00% | 17.25% |
| SAIDI Improvement | 27.34% | 4.81% | 0.00% | 12.88% |

Another area of study for the Company was to evaluate the rates of adoption by customers of the interval energy data provided by advanced metering as a tool to help them reduce their energy use. In addition, the actual energy savings achieved by those customers was also estimated. The report documenting the results of this investigation, as developed by the independent consultant Freeman, Sullivan and Company, is provided as PC/EP\_DR\_001 Attachment C.

An additional interest of the Company was to build on its experience with the deployment of automated metering, and in particular, in the evaluation, selection and operation of the systems required for deployment and operation of an advanced metering system. Some of Avista’s key learnings include the following:

* Hardware cost estimates: Pullman allowed Avista to understand more about the hardware components that are needed for a modern AMI system, and the costs associated with the system.
* Software cost estimates: The Pullman project provided Avista the opportunity to better understand the software systems required to operate the metering system, and it also provided insight into the complexity of the system integrations required to make a full-scale project successful. This provided the Company greater capability in the planning and budgeting process for these systems.
* Application analysis: Several applications for AMI were explored during the Pullman project, including voltage alarms, outage notifications, data analytics, and remote meter configuration. The project allowed Avista to better understand how the available technology supports these uses, and what features to include in the scoping for AMI system procurement.
* CVR benefits analysis: The Company used results from the project to analyze the incremental benefits AMI could provide to Avista’s existing CVR efforts if voltage alarming from the meters was integrated with the distribution management system.
* Remote reconnect benefits: Results from the Pullman deployment provided more confidence in the estimates of the savings that could be expected from the remote service switches in meters.
* System performance knowledge: Lessons learned about the performance of the five-minute interval energy data capability in a real world environment helped validate its feasibility for the Company.

Avista has developed a range of presentations on the Pullman project that have been made to Company employees, mid-level managers, directors and senior executives, as well as its Board of Directors. These presentations are provided as PC/EP\_DR\_001 Attachment D. Due to the size of the presentations, they are being provided with this response on compact disc (CD).

1. The data collected is important as it related to the Company’s energy savings under I-937 in Docket No. UE-111882. [↑](#footnote-ref-1)
2. The Company’s tariffed voltage range is 114-126. [↑](#footnote-ref-2)