PacifiCorp - Stakeholder Feedback Form

2015 Integrated Resource Plan

PacifiCorp (the Company) requests that stakeholders provide feedback to the Company upon the conclusion of each public input meeting and/or stakeholder conference calls, as scheduled. PacifiCorp values the input of its active and engaged stakeholder group, and stakeholder feedback is critical to the IRP public input process. PacifiCorp requests that stakeholders provide comments using this form, which will allow the Company to more easily review and summarize comments by topic and to readily identify specific recommendations, if any, being provided. Information collected will be used to better inform issues included in the 2015 IRP, including, but not limited to the process, assumptions, and analysis. In providing your feedback, PacifiCorp requests that the stakeholders identify whether they are okay with the Company posting their comments on the IRP website.

☒Yes ☐No	May we post these comments to the IRP webpage?	Date of Submittal	8/12/2014
*Name:	Kevin Emerson (on behalf of WRA and SWEEP – see below)	Title:	**Senior Policy and Regulatory Associate**
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Address:	1014 2nd Avenue		
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Public Meeting Date comments address: **N/A** ☒ Check here if not related to specific meeting

List additional organization attendees at cited meeting: **N/A**

*__IRP Topic(s) and/or Agenda Items:__ List the specific topics that are being addressed in your comments.
PacifiCorp's Conservation Voltage Reduction Study and Assessment

☐ Check here if any of the following information being submitted is copyrighted or confidential.

*__Respondent Comment:__ Please provide your feedback for each IRP topic listed above.
I am submitting these comments on behalf of Ken Wilson, Western Resource Advocates and Howard Geller, SWEEP in regard to PacifiCorp's Conservation Voltage Reduction Study and Assessment. SWEEP and WRA believe that the CVR analysis in the last PacifiCorp IRP is badly out of date and needs revision, and that CVR offers significant cost-effective energy savings potential in the PacifiCorp service territory as is the case elsewhere. We request that this topic be included in one of the upcoming IRP stakeholder meetings.

Please direct your response to Howard Geller, SWEEP: hgeller@swenergy.org, 303-447-0078x1

Data Support: If applicable, provide any documents, hyper-links, etc. in support of comments. (i.e. gas forecast is too high - this forecast from EIA is more appropriate). If electronic attachments are provided with your comments, please list those attachment names here.
See comments attached to email

Recommendations: Provide any additional recommendations if not included above - specificity is greatly appreciated.
See comments attached to email

Thank you for participating.

* Required fields

Comments on PacifiCorp's Conservation Voltage Reduction Study and Assessment

Ken Wilson, Western Resource Advocates
Howard Geller, SWEEP
May 23, 2014

Conservation Voltage Reduction (CVR) is a strategy for controlling voltage levels on distribution system feeders so that voltages are reduced at times and places when they would otherwise be excessive, but are still maintained within acceptable levels; e.g., 114-120 Volts at the customer meter on low voltage feeders. Reducing the voltage at times leads to a reduction in electricity consumption in a wide range of end-use devices including incandescent and fluorescent lamps, motors, and devices that are powered by motors such as refrigerators, furnace fans, and air conditioners. Customers do not notice any change in the performance of the devices that experience the voltage reduction. In other words, a utility installs and operates voltage control devices in its distribution system and customers save energy and reduce their utility bills as a result.

In 2011 and 2012 PacifiCorp (the Company) conducted a study in Washington of the energy savings that CVR might have on circuits that the Company thought might have good CVR potential. The Company conducted a pilot project on four of the circuits that were studied to determine actual savings. The pilot project reported relatively low energy savings on the four circuits tested. The Company then screened all of the circuits in Oregon, Idaho, Wyoming and Utah with the same screening methods used in Washington, and based on the results from Washington concluded that CVR will not provide significant energy savings in a cost effective manner in any of these states[1]

The CVR technique that the Company used in its Washington pilot project is an outdated method that was first used in California in the 1970's to reduce energy consumption during peak events. The technique bases voltage reductions on statistical methods and limited voltage readings, none of them in real time, to lower voltages in a very conservative manner. This method of CVR is badly out of date and not consistent with current practice in the utility industry.

In the past five years, much more sophisticated methods have been developed to implement CVR in an adaptive manner using real time, or near real time, voltage measurements from multiple points on each circuit. National studies by DOE[2][3] have determined that significant energy savings, on the order of 2% to 3% of all energy used, can be obtained by implementing these newer methods of CVR. Furthermore, a number of utilities including Dominion Power, Xcel Energy and the Snohomish County PUD have conducted pilot programs and are already

[1] PacifiCorp 2013 IRP. Volume 2, pp. 67-70.
[2] *Application of Automated Controls for Voltage and Reactive Power Management – Initial Results.* U.S. DOE. Dec 2012. https://www.smartgrid.gov/sites/default/files/doc/files/VVO%20Report%20-%20Final.pdf
[3] Schneider, Fuller, Tuffner and Singh. *Evaluation of Conservation Voltage Reduction (CVR) on a National Level.* PNNL-19596. Pacific Northwest National Laboratory, Richland, WA. July 2010. http://www.pnl.gov/main/publications/external/technical_reports/PNNL-19596.pdf

planning full scale implementation of these state-of-the-art approaches to CVR based on findings that 2-3% energy savings are achievable in a very cost-effective manner.[4]

Within the region, Xcel Energy is proposing to implement CVR system wide in Colorado. They call this project DVO (Distribution Voltage Optimization). Prior to proposing CVR system wide, Xcel Energy conducted two pilot projects, one in Englewood, CO and the other in Boulder, CO, that found that DVO reduces customers' electricity use by approximately 2% on average, with all or nearly all customers realizing some level of energy savings.[5] The total cost for implementing DVO system wide is estimated to be $92 million, with implementation taking place over five years (2015-2020) if the DVO program is approved by the Colorado PUC. Voltage on distribution circuits will first be levelized and voltage meters installed with communication back to the substation. Once all circuits at a substation have been treated in this manner, the Load Tap Changer and Capacitor Banks will be adaptively controlled by DVO software to adjust voltages to a lower range, still within standards. Xcel is confident that DVO will work on the vast majority of their circuits, and has estimated that its DVO program would provide its customers $271 million in net benefits and have a benefit-cost ratio of 4.0 under the Utility Cost test.[6]

In another example, NV Energy has proposed implementing a pilot CVR project in the Nevada Power Company (i.e., metro Las Vegas) territory, using more sophisticated CVR techniques as described above. The Nevada Public Utility Commission has approved the first phase of the Pilot, which is proposed for up to six substations and associated feeders, meaning it could cover 50,000 customers or more. The pilot will run for most of 2015 and would provide results by the end of that year.

A third example is a pilot of adaptive CVR by Central Lincoln PUD in Oregon. The Central Lincoln PUD installed an AMI system and piloted CVR with adaptive, real time control on one substation. During the six month pilot, the substation LTC set point was reduced from 123.5 V to approximately 119.5 V while maintaining end user voltages within required standards. The average voltage reduction was 2.6% with an overall average energy savings of 2.15%. Based on the success of the pilot, the Central Lincoln PUD plans to install adaptive CVR on its entire system.[7]

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[4] *Volt/VAR Optimization Improves Grid Efficiency*. NEMA. http://www.nema.org/Policy/Energy/Smartgrid/Documents/VoltVAR-Optimazation-Improves%20Grid-Efficiency.pdf

[5] See Direct Testimony of Kelly Bloch on behalf of Public Service Company of Colorado, Docket No. 13A-0686EG. Public Utilities Commission of Colorado. June 17, 2013.

[6] See Rebuttal Testimony of Jeremy Petersen on behalf of Public Service Company of Colorado, Docket No. 13A-0686EG. Public Utilities Commission of Colorado. Dec. 20, 2013.

[7] See filing in NV PUC docket 12-10013 on May 15, 2014 by Dominion Resources Services, Inc. of Central Lincoln's report titled "Voltage Management at Central Lincoln PUD".

The CVR technique that PacifiCorp studied and piloted in Washington is known to average only approximately 0.5% energy savings over a wide range of circuits. The technique that Xcel Energy is using will average, by their best estimates, approximately 2% energy savings. Dominion Virginia Power, and Dominion Volt, their subsidiary that markets CVR software, believe that an average of 3% energy savings can be realized when metering is more widespread at customer meters.[8] These estimates are all consistent with EPRI and DOE studies.

There is a difference in the application of CVR in rural versus urban areas. PacifiCorp's circuits in Washington are primarily rural, with circuit lengths that average 25 miles. It is generally true that it is more difficult for CVR to show a positive business case on rural circuits compared to urban circuits. The longer circuit lengths lead to more voltage drops that are difficult to manage. Urban circuits are shorter, with average lengths of 4 miles, and are usually more easily adapted to voltage reduction techniques.

Based on both the Xcel proposal and information from EPRI and DOE, we believe that PacifiCorp has greatly underestimated the potential for adaptive CVR, especially on urban circuits. The Company's assertion that CVR is unlikely to provide energy savings at a cost above the Company's marginal purchase cost is inconsistent with information from other utilities and from pilots and analysis by many other utilities. In particular, we believe that Utah may be an especially interesting system for CVR, with many shorter circuits in the Salt Lake City area.

We strongly recommend that PacifiCorp revise its CVR analysis based on the state-of-the-art of CVR and results seen or projected by a wide range of utilities around the country. This "state-of-the-art CVR" (as opposed to outdated CVR) can and should be considered as a resource in PacifiCorp's next IRP.

In addition, we recommend that PacifiCorp undertake a CVR pilot along the lines of what Xcel Energy and the Central Lincoln PUD have already done and what NV Energy will do in Las Vegas. We believe that Salt Lake City would be an appropriate place for the pilot. If the pilot is successful and state-of-the art CVR is proven to be feasible and cost effective in the PacifiCorp territory (as it has been elsewhere), we recommend that it be incorporated into DSM program portfolios, or implemented outside of DSM, in Utah and elsewhere within the PacifiCorp system when feasible and cost effective. The potential benefits are quite significant—on the order of 500 GWh per year of energy savings and $35 million per year in reduced utility bills in PacifiCorp's Utah service territory alone.

[8] Testimony of Phil Powel, Dominion Volt, NV PUC docket 12-10013, May 8, 2014.