

PacifiCorp - Stakeholder Feedback Form

2019 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 2019 IRP, including, but not limited to the process, assumptions, and analysis. In order to maintain open communication and provide the broader Stakeholder community with useful information, the Company will generally post all appropriate feedback on the IRP website unless you request otherwise, below.

Date of Submittal 1/28/2019

*Name: Richard Keller

Title: IPUC

*E-mail: rick.keller@puc.idaho.gov

Phone: 208-334-0348

*Organization: Idaho Public Utilities Commission

Address: 472 W. Washington St

City: Boise State: ID Zip: 83720

Public Meeting Date comments address: 12/3/2018 Check here if not related to specific meeting

List additional organization attendees at cited meeting: Bentley Erdwurm

***IRP Topic(s) and/or Agenda Items:** List the specific topics that are being addressed in your comments.

The following questions are related to the Reliability Assessment presented during the December 3rd and 4th 2019 Integrated Resource Plan (IRP) Public Input Meeting.

1. Please explain the basis and/or method used to derive the requirements for spin, non-spin, and regulation reserves that are reflected in the reliability assessment section of the December 3rd and 4th IRP Public Input Meeting. Please provide any workpapers with formula intact that show any derivations.

PacifiCorp Response:

For background on the reserve requirements included in integrated resource plan (IRP) modeling, please refer to PacifiCorp's Flexible Reserve Study, Appendix F in the 2017 IRP available at: www.pacificorp.com/es/irp.html. The spinning and non-spinning reserve requirements modeled in the 2019 IRP are derived from the North American Electric Reliability Corporation (NERC) regional reliability standard BAL-002-WECC-2, which specifies that each Balancing Authority Area (BAA) must hold as contingency reserve an amount of capacity at least equal to the greater of three percent of load and three percent of generation in that BAA, and the largest single contingency (*i.e.*, generator or transmission line) in that BAA. Contingency reserves must be available within ten minutes, and at least half must be from "spinning" resources that are online and immediately responsive to system fluctuations. Contingency reserves may be deployed when unexpected outages of a generator or a transmission line occur. Contingency reserves may not be deployed to manage other system fluctuations such as changes in load or wind generation output. The Planning and Risk (PaR) model used in IRP analysis includes spinning and non-spinning requirements intended to reflect PacifiCorp's compliance obligations under reliability standard BAL-002-WECC-2.

As described in the Flexible Reserve Study from the 2017 IRP, regulation reserve requirements are intended to ensure that imbalance between the load and resources in each of PacifiCorp's BAAs does not exceed specified bounds for more than thirty consecutive minutes. There is no simple formula on the capacity required to achieve this, as it is dependent on the uncertainty and variability of the loads and resources in a BAA. Instead, the Flexible Reserve Study describes the methodology PacifiCorp used to review historical variations in load and resources to determine how much flexible resources must be available to ensure compliance with a high degree of certainty and accounting for the diversity of the PacifiCorp portfolio, as well as diversity benefits from participating in Energy Imbalance Market (EIM). The results of this analysis are an hourly regulation reserve requirement that varies as a function of the wind, solar, and load in each

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BAA. For additional detail, please refer to the slides addressing the Flexible Reserve Study at the August 30-31, 2018 and September 27-28, 2018 public input meetings for the 2019 IRP here <http://www.pacificorp.com/es/irp/pip.html>.

2. For each of the Company's generating units that can provide operating reserves, please provide the maximum amount of capacity that each can provide, broken down by the different types of reserves (i.e. spin, non-spin, and regulation).

PacifiCorp Response:

Please refer to the accompanying file "Resource Reserve Assumptions.xlsx", detailing reserve assumptions for non-renewable resources. For the 2019 IRP, PacifiCorp is modeling reserve carrying capability for wind and solar resources with requisite contractual rights and controls that can provide regulation reserves when forecasted output can be curtailed to free-up operating capacity on the system.

3. In the Company's reliability assessment in the December 3-4, 2018 presentation, only Company-owned dispatchable resources were used as operating reserves. Please provide any additional Company-owned (e.g. synchronous condenser) and/or market-based resources (i.e. Energy imbalance market, ancillary service providers) that could be used to meet any shortfalls in reserves.

PacifiCorp Response:

At this time PacifiCorp does not have any other owned resources that could provide operating reserves. Similarly, while PacifiCorp could potentially contract for ancillary services with other utilities or generation resources, there is not an organized market for ancillary services that could be called upon for short-term requirements so pricing and availability are unknown and not modeled at this time.

4. Can and should the Company's operating reserve requirements be fulfilled using shared reserves with other balancing authorities? Please explain.

PacifiCorp Response:

PacifiCorp participates in the Northwest Power Pool contingency reserve sharing program. Under the program, utilities hold operating reserves to cover their individual obligations (3% of load and 3% of generation), but can call on the reserves held by other participants in the 60 minutes following a large outage event. This reserve sharing program eliminates the need to account for the largest single contingency event and provides a more rapid response following outage events, as the deployment is spread across more generating units.

PacifiCorp also participates in the Western Frequency Response Sharing Group. NERC standard BAL-003-1 specifies that each BAA must arrest frequency deviations and support interconnection frequency when it drops below the scheduled level. When a frequency drop occurs, each BAA is expected to deploy resources that are at least equal to its Frequency Response Obligation. The incremental requirement is based on the size of the frequency drop and the BAA's Frequency Response Obligation, expressed in MW/0.1Hz. The additional capacity must be deployed immediately, and performance is measured over a period of seconds, amounting to under a minute. To comply with the standard, a BAA's median measured frequency response during a sampling of under-frequency events must be equal to or greater than its Frequency Response Obligation. In order to remain in good standing in the group, a utility must demonstrate that it is meeting the median response required in the standard. As a whole, the Western Frequency Response Sharing Group has significantly exceeded the required performance, so it acts as insurance policy to limit the risk and NERC penalties associated with non-compliance. For additional details on the frequency response sharing group, please refer to this presentation: https://www.wecc.biz/_layouts/15/WopiFrame.aspx?sourcedoc=/Administrative/Western%20Frequency%20Response%20Sharing%20Group%20-%202018.pdf&action=default&DefaultItemOpen=1

The above reserve sharing groups do not generally reduce PacifiCorp's required obligations. As a result, they would not compensate for any reserve shortfalls identified through IRP modeling.

PacifiCorp also receives reserve benefits from participating in the EIM, as the California Independent System Operator (CAISO)'s dispatch of resources from a diverse footprint reduces regulation reserve requirements and provides a larger pool of resources that can respond rapidly and cost-effectively. This EIM diversity benefit is incorporated in the regulation reserve calculation described in response to question 1.

While it is possible for PacifiCorp to purchase operating reserves from either another utility or a specific resource, this would require a bilateral negotiation as there is no formal market at this time. There are also restrictions on how different types of operating reserves could be transferred to PacifiCorp's BAAs which would preclude transactions with some

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potential counterparties or make such transactions cost-prohibitive. For long term planning purposes, the IRP does not assume that a short-term ancillary services market would exist though it does include interruptible loads that could be offered and managed by an aggregator as part of a long term program. To the extent PacifiCorp identifies needs for additional ancillary service capability either as part of the IRP or in its day-to-day operations, it would look at the available alternatives on a bilateral basis and would evaluate any viable solution offered in a Request for Proposal (RFP).

5. Are there any efforts by the Company to share reserves with other balancing authorities or other entities?

PacifiCorp Response:

No.

6. Will coal plant retirements affect variable generation integration costs? If so, to what extent?

PacifiCorp Response:

Variable generation integration costs are an estimate of the cost of maintaining sufficient flexible capacity to compensate for changes in wind and solar generation. Retiring coal resources that can provide operating reserves tends to increase integration costs as any reserves held would be spread to the remaining flexible resources. If the available flexible resources are generating and must be backed down to provide reserves, this increases costs as a result of reduced market sales or increased market purchases. However, if PacifiCorp’s portfolio adds resources that can provide operating reserves, this could more than offset the impact of the coal retirement. In short, integration costs are dependent on the PacifiCorp’s portfolio, both in the resources being integrated, and in the resources providing regulation reserve—changes in any of these variables would affect integration costs in some way.

The System Optimizer model (SO) does not endogenously account for operating-reserve costs or the value provided by resources that can hold operating reserves. To help it better account for the value of these attributes, integration costs are added to variable generation resources and operating reserve credits are added to resources that primarily provide reserves rather than energy. Once the portfolio selected by SO is placed in the PaR model, these cost adjustments are removed, as the PaR model is loaded with the incremental reserve requirement and calculates the costs of holding reserves specific to that portfolio--reserve requirements vary based on the selected portfolio of wind and solar resources, and with regard to the reserve supply, which is also impacted by the portfolio selection. As a result, PacifiCorp hasn’t specifically recalculated integration costs after coal plant retirements, but those costs are directly included in the reported results from the PaR model.

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

Check here if you do **not** want your Stakeholder feedback and accompanying materials posted to the IRP website.

***Respondent Comment:** Please provide your feedback for each IRP topic listed above.

[Click here to enter text.](#)

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.

[Click here to enter text.](#)

Recommendations: Provide any additional recommendations if not included above - specificity is greatly appreciated.

[Click here to enter text.](#)

Please submit your completed Stakeholder Feedback Form via email to IRP@PacifiCorp.com

Thank you for participating.

* Required fields