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**PacifiCorp’s Comments on the Day-Ahead Market Enhancements  
June 19, 2018 Stakeholder Workshop**

PacifiCorp hereby submits the following comments to the California Independent System Operator Corporation (“ISO”) on the Day-Ahead Market Enhancements stakeholder workshop that was held June 19, 2018, (“Workshop”). PacifiCorp appreciates the opportunity to provide comments for the ISO’s consideration.

**Introduction**

The ISO stated in its revised straw proposal published April 11, 2018 (“Revised Straw Proposal”), that the purpose of the initiative is to improve grid reliability and efficiency of its day-ahead market. The ISO proposed the following enhancements to achieve these improvements:

- Change the day-ahead market from hourly to 15-minute scheduling granularity;
- Combine the integrated forward market (“IFM”) with the residual unit commitment (“RUC”) processes; and
- Procure imbalance reserves that will have a must offer obligation to submit economic bids for the real-time market.

PacifiCorp understands that this initiative proposes enhancements to the ISO’s day-ahead market in the ISO balancing authority area (“BAA”), and that the scope of extending the day-ahead market initiatives to the energy imbalance market (“EIM”) will be addressed in a separate stakeholder initiative.

PacifiCorp thanks the ISO for its responses to comments on the Revised Straw Proposal, and for conducting the Workshop, and offers the comments below for the ISO’s consideration.

**Fifteen-Minute Scheduling Granularity**

PacifiCorp continues to support the proposed enhancement that would provide the capability to submit 15-minute base schedules in the EIM, as it would give EIM scheduling coordinators the ability to better manage their non-participating resources across the hour as well as manage solar



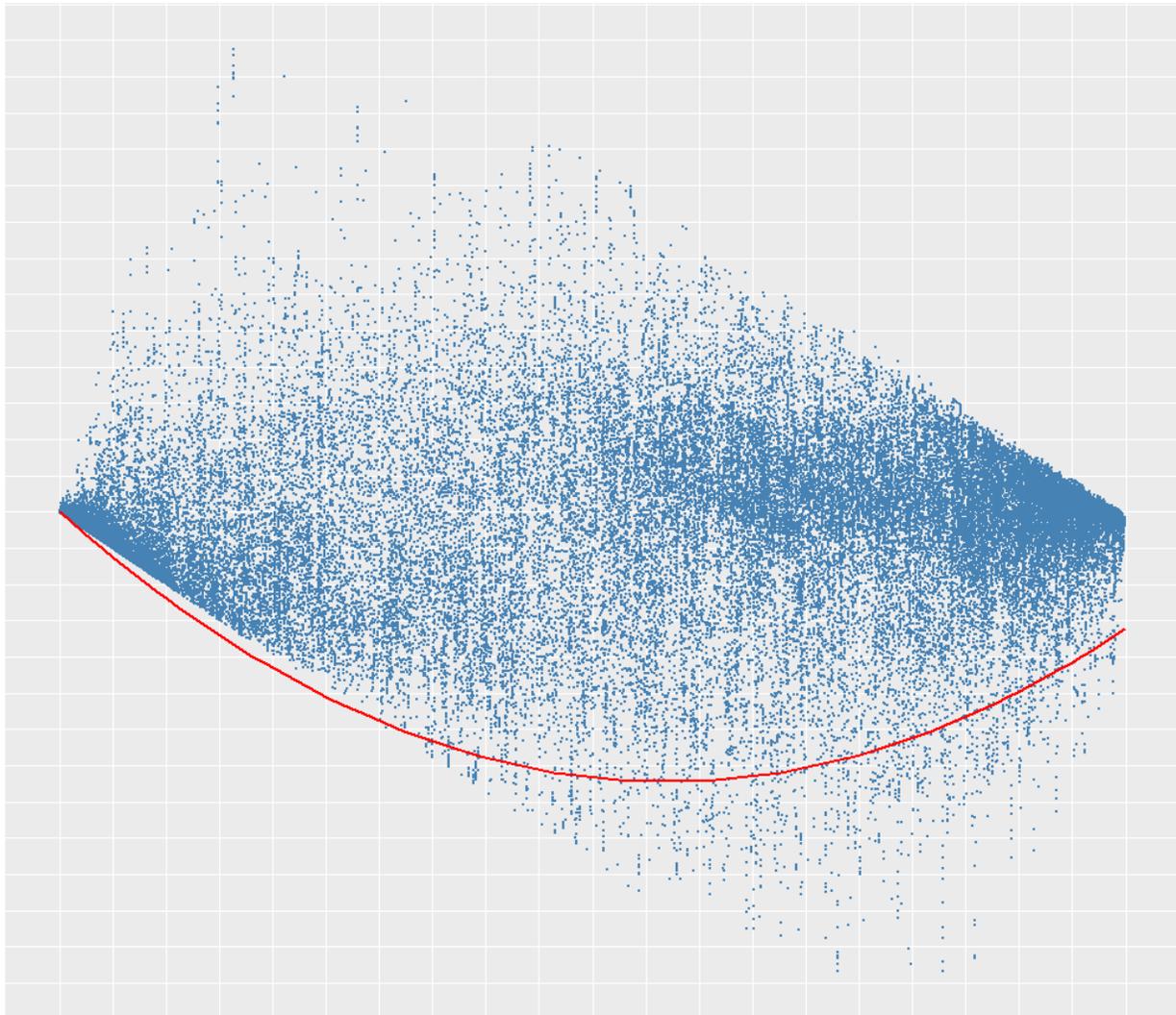
and load ramping events more efficiently. However, PacifiCorp requests that the ISO clarify whether real-time base schedules will need to be submitted every 15 minutes, and thus be subject to resource sufficiency tests before every 15-minute interval, or if base schedules will still be submitted hourly but with 15-minute granularity, with resource sufficiency tests conducted only for the hour, as is done today.

PacifiCorp will need to make enhancements to systems and software to accommodate 15-minute scheduling granularity and there is a need for clarity on the base scheduling requirements, resource sufficiency and balancing schedule tests in order to timely and adequately schedule and implement these enhancements. At a minimum, PacifiCorp's ability to submit 15-minute schedules will be dependent on the ability of the software vendors to modify, test and deliver updated software. In addition, the proposed changes will require modifications to the EIM entities' internal business processes. PacifiCorp recommends that the ISO incorporate proposed process and system change timelines into its implementation timeline accordingly. Further, PacifiCorp seeks information from the ISO regarding the impact on an EIM entity, should it be unable to meet the ISO's implementation deadlines.

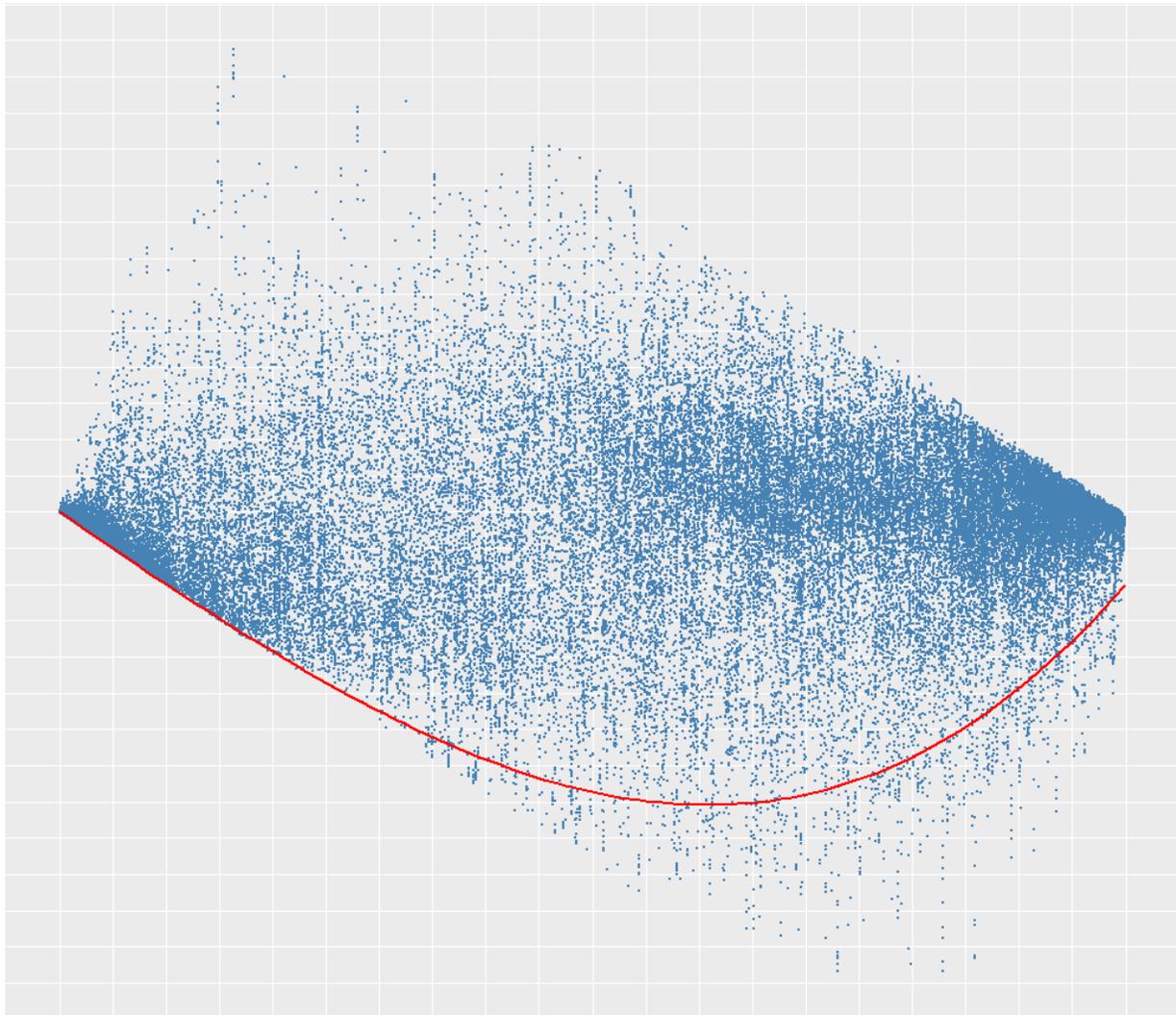
### **Day-Ahead Flexible Ramping Product Uncertainty Requirement**

PacifiCorp is supportive of an approach that takes into consideration the forecast levels of wind, solar and load. The proposed change to a quantile polynomial regression method, for determining the uncertainty requirement, is a definite improvement to the old method. The ISO, in its DA FRP presentation, illustrated a second order (quadratic) polynomial. However, given certain distributions of forecast errors, the quadratic fit may produce uncertainty requirements which are greater than the possible uncertainty for certain forecast levels.

For example, in the below figure (produced using actual PacifiCorp solar data), at low forecast levels the quadratic fit would produce uncertainty requirements that are greater than the possible uncertainty that could materialize.



However, if a third order polynomial were applied, the results would be more representative of reality, as illustrated in the below figure.



PacifiCorp urges the ISO to explore how the forecast error distribution across different entities and across different time periods may require different regression techniques, in the event that a quantile polynomial regression method is employed.

PacifiCorp is also concerned with the formulation of the adjustment ratio, specifically as it applies to the use of the histogram-based component substitution requirement (HCSR). One of the reasons for moving away from the current histogram-based methodology is that the VER forecast level is not factored into the uncertainty requirement. However, by creating an adjustment ratio based on the current histogram methodology, the aforementioned flaw may be captured within the ratio (depending on the specific methodology used to construct the ratio) and consequently, the ratio may not be accurate, depending on the forecast levels prevalent in the data used to create the ratio.



PacifiCorp urges the ISO to carefully consider the construction of the adjustment ratio, such that the forecast levels of wind and solar are correctly represented within the HCSR.

With the use of a rolling history for the previous N days (e.g.,  $N = 40$ ), PacifiCorp is concerned about the impact of data input errors on the output of the regression. For example, in the bid range capacity test, PacifiCorp recently experienced one-time data error issues which resulted in the capacity test's histogram reflecting artificially high requirements. Within the context of the flexible ramping product, there exists the potential for data errors to artificially inflate the load, wind or solar variation such that even while restricting the data to the 95<sup>th</sup> percentile, the uncertainty requirement output could be artificially amplified for the proceeding N days.

PacifiCorp believes there should be a mechanism in place for the ISO to identify data errors, (or have these data errors identified for them) within the rolling history, and exclude them if it is deemed appropriate.

### **Cost Allocation**

The ISO proposes to allocate costs of the DA FRP using the same principles and determinants used with the FMM FRP. Upward uncertainty costs will be allocated to upward uncertainty movement and downward uncertainty costs will be allocated to downward uncertainty movement. Scheduled energy costs will be allocated to metered demand. As stated in previous comments, PacifiCorp is supportive of a cost allocation of the DA FRP that is allocated to the day-ahead market. However, PacifiCorp is concerned that with the real-time must-offer obligation and extended unit commitment horizons, uneconomic operation of resources relative to real-time energy prices is more likely to occur.

PacifiCorp appreciates the spreadsheet examples provided by the ISO to show how settlement statements would work, but, PacifiCorp is concerned that there is a risk for increased real-time bid cost-recovery due to additional commitments on a day-ahead basis that may not be needed in real-time. While PacifiCorp understands the need for additional resources to manage uncertainty on a day-ahead basis, and operates its system similarly, it does not want to be burdened with the additional cost associated with the new product. Within the context of the explanation there was no discussion of allocation to EIM participants, but PacifiCorp would like to confirm that the cost allocation would not apply to changes from EIM base schedules and will only apply to changes from IFM schedules.

### **Conclusion**

PacifiCorp appreciates the ISO's consideration of these comments and questions and looks forward to the ISO's draft final proposal.