BEFORE THE PUBLIC UTILITY COMMISSION

OF OREGON

UM 1355

In the Matter of THE PUBLIC UTILITY COMMISSION OF OREGON Investigation into Forecasting Forced Outage Rates for Electric Generating Units	STAFF'S OPENING BRIEF

1. Introduction

The Public Utility Commission of Oregon (Commission or PUC) opened this docket to explore issues surrounding the topic known as "forced outage rates" (FOR), and more specifically, to establish a methodology for forecasting FORs. The Commission's stated goal was to obtain "the most accurate forecast of forced outages at the relevant plants." *See* PUC Order No. 07-015. In the first phase of this proceeding, Staff proposed a method that it supported as being demonstrably superior to the current forecasting method of a simple four-year average and the proposed PacifiCorp methodology. Staff advocated using a "collar" mechanism using North American Electric Reliability Corporation (NERC) 90th and 10th percentile values as the objective outlier identifier, and then replacing these identified outlier values with the applicable 90th and 10th percentile NERC values. After considering the comments of all parties, the Commission proposed the following hybrid collar mechanism ("Commission Collar"):

> The Parties agree that for each year in which a coal fired unit's annual FOR falls outside the 10th or 90th percentile of comparable NERC coal units, the methodology for calculating the forced outage rate shall be as set forth in Staff/200, Brown/8-15, *except that, instead of adjusting the FOR to the 10th or 90th percentile values for the calendar year, the mean annual FOR for the unit's entire historical data shall be substituted.*

Order 09-479 at 1-2 (emphasis added). The emphasized language is the Commission's proposed "replacement strategy" for outliers that are identified by the methodology stated

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in the first part of the sentence.

Staff finds no compelling reason why the Commission should not impose its proposed Collar. However, staff proposes an alternative replacement strategy to address its own, as well as Portland General Electric's (PGE) and Idaho Power's, concerns about the relevancy of historical data, and a concern about limited data sets for purposes of the Commissions proposed long-term average.

2. Procedural Background

This docket has proceeded through various stages and, in the present phase, has been refined to determine the most "accurately predictive" FOR "Collar." *See* PUC Order No. 10-157 at 2. As will be discussed, that narrow issue has been further distilled to an inquiry into the most appropriate "replacement" or "substitution" strategy for the "outliers" (i.e. extreme outage events) that are identified by the Collar methodology.

In its Order 09-479, the Commission endorsed, and clarified, the Notice of Intent to Modify Stipulations and Establish Rate Calculation earlier issued by Administrative Law Judge Arlow. In pertinent part, the Commission proposed to amend PGE's, Idaho Power's and staff's respective stipulations to adopt the Commission Collar.

PGE and Idaho Power subsequently filed testimony challenging or questioning the Commission Collar. Staff and the Industrial Customers of Northwest Utilities (ICNU) submitted reply testimony and a hearing was held on August 23, 2010. PacifiCorp was not allowed to submit additional testimony but was permitted to participate in the hearing. Idaho Power did not participate in the hearing because, after testimony had been filed, staff and Idaho Power reached a settlement in principle.

3. The Collar Mechanism and a Replacement Strategy

In its ratemaking process the Commission uses a simple four-year moving average to forecast the forced outage rate of a coal-fired unit for the test period. A widely accepted principle in forecasting, especially forecasts using time-series data sets that have

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a limited number of data points, is to eliminate an outlier value so that it does not inappropriately influence the forecasted value. Based on this premise, the parties proposed collar methodologies that would achieve an increased level of accuracy over the current four-year average. The Commission proposed a collar mechanism that it believed was reasonable given the information provided within the first phase of the proceeding.

In this second phase of the proceeding, PGE and Idaho Power have expressed concerns as to the validity of using a long-term average that incorporates forced outage rate data that may no longer be relevant and unintentionally bias the forecast. *See generally* PGE/300, Idaho power/100. In addition, staff has concerns as to the length of historical plant data that is available for the specific coal-fired generating units of the individual utilities. *See* Staff/400, Brown/6.

In its opening testimony, PGE questioned ICNU's assertions that its proposed method is more accurate than the original staff proposal. PGE's critique of the ICNU method was primarily based on ICNU's theory that there is "mean reversion" over the life of a coal plant in its forced outage rates. Essentially, PGE claimed that the historical data set was a non-stationary time series, or in layman's terms, that the plant's annual average FOR was changing through time and would not return to one stationary value or mean. *See generally* PGE/300.

Idaho Power also raised a concern with regard to using a long-term historical average as a replacement value because it believes that over time the physical and operational characteristics of the Company's thermal fleet have changed. Idaho Power gave the example of maintenance procedures and the fact that they are completely different than those used at the plant 20 to 30 years ago. *See* Idaho Power/100, Carstensen/6, Lines 1-3.

However, PGE and Idaho Power did not provide statistical evidence of their conclusions with regard to a changing long-term average, or implications that changes in

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operations have had a significant change in the forced outage rate over time. Staff analyzed the PGE and Idaho Power testimony and found that while there were significant changes in the mean when calculating a rolling ten-year average, staff was unable to verify PGE's and Idaho Power's concerns, due to a lack of historical outage rate data. *See* Staff/400, Brown/6.

Lastly, PGE refuted ICNU's theory that its methodology provides greater forecast accuracy than the proposed staff method. PGE cited methodological errors in ICNU's conclusions, and an inaccuracy in ICNU's calculation. PGE's ultimate conclusion was that the ICNU method was not demonstrably superior to the staff method, but essentially equivalent in its forecast results. *See* PGE/300, Tinker-Weitzel/1-2.

Given the lack of statistical evidence in support of parties concerns with historical plant data, and a relative statistical tie between the proposed staff method and the ICNU forecasting method, staff concluded that it could not find a compelling reason for the Commission to alter its decision in Order No. 09-479. *See* Staff/400, Brown/2. However, staff finds that the concerns identified by Idaho Power and PGE, and a possible trend in the average of individual plants over time, should be taken into consideration. It is this reason that staff witness Brown provided an alternative proposal to the Commission.

Essentially, staff proposes to use a rolling ten-year average as the replacement value for the identified outlier, rather than the long-term historical average as proposed by the Commission. At the hearing, staff provided a simple example of how its ten-year average replacement strategy would work: PacifiCorp's Coal Strip 3 coal plant had a FOR in 2002 of approximately 36.8 percent. Under staff's alternative proposal, it is first necessary to determine whether the 2002 FOR was an outlier (extreme outage event) using the NERC 90/10 percentiles. Assuming 2002 is identified as an outlier, the next step is to determine the ten-year FOR average for the period 2008 through 1999 (i.e. the

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most recent ten-year rolling average of the FOR for the plant at issue).

In order to determine the ten-year average for the period 2008 through 1999, it would be necessary to determine and replace outliers back to 1999. In fact, it is possible to identify outliers back to the beginning of the plant's operation. This initial outlier identification and replacement analysis would only need to be performed once, and once it was complete, it would be used going forward without having to recalculate the historical data. *See* Transcript at 20-24 (cross examination of staff witness Brown).

Staff is aware that PGE's lawyer at the hearing stated it would take the company "two to three weeks" to fully analyze staff's proposal. Transcript at 44. Similarly, PacifiCorp's witness Duvall testified that staff's proposal was unclear and not fully understood by the company. Transcript at 48-49.

Staff disagrees that its proposal is complex, unclear or difficult to understand. Its simplicity is illustrated by the above example. Indeed, staff witness Brown testified that the underlying method to her proposal is very similar to PacifiCorp's 28-day outage proposal submitted in its supplemental testimony. *See* Transcript at 24, implicitly referencing PPL/102, Godfrey/8-11. Moreover, Witness Falkenberg found staff's proposal, a ten-year average, to be "not difficult to compute." Transcript at 37.

Lastly, ICNU's expert witness Falkenberg testified at the hearing that he had reviewed staff's proposal and found that it would produce more accurate results than staff's original proposal. Transcript at 38.

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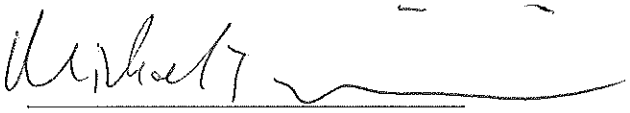
4. Conclusion

For the reasons stated, staff concludes the Commission Collar is appropriate to resolve the remaining FOR issues. However, if the Commission agrees with staff, Idaho Power and PGE's concerns with regard to irrelevant historical data, a changing mean through time, and incomplete historical plant data, it may consider adopting staff's alternative proposal for the substitution strategy.

DATED this 8th day of September 2010.

Respectfully submitted,

JOHN R. KROGER
Attorney General



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CERTIFICATE OF SERVICE

I certify that on September 8, 2010, I served the foregoing Staff's Opening Brief upon all parties of record in this proceeding by delivering a copy by electronic mail and by mailing a copy by postage prepaid first class mail or by hand delivery/shuttle mail to the parties accepting paper service.

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