

# Memorandum

**To:** ISO Board of Governors

**From:** Jim Detmers, Vice President of Operations

**Date:** October 21, 2009

**Re:** **Decision on Outage and Forecasting Modifications for Eligible Intermittent Resources**

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*This memorandum requires Board action.*

## EXECUTIVE SUMMARY

The California Independent System Operator Corporation (ISO) must be able to accurately predict production from variable generation, such as wind and solar resources. Forecasting improvement therefore constitutes a critical component of the ISO's overall strategy to successfully manage the operational and market challenges posed by an increasing reliance on intermittent resources to meet the State's electricity needs. ISO experience gained through administration of the Participating Intermittent Resource Program (PIRP) demonstrates that poor data quality significantly undermines forecasting accuracy.

In order to improve the quality of data received from intermittent resources and thereby support more accurate forecasts, Management proposes the following two changes to the tariff:

- Expand the scope of resources subject to the obligation to install specified forecasting and telemetry equipment and to communicate relevant data to the ISO. Currently, the obligation applies only to participating intermittent resources.<sup>1</sup> Management proposes to extend the obligation to all interconnecting eligible intermittent resources<sup>2</sup> that have executed a participating generator agreement (PGA) or a qualifying facility participating generator agreement (QF PGA), unless otherwise exempt as discussed further below.

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<sup>1</sup> A participating intermittent resource is an eligible intermittent resource that meets certain requirements and elects to schedule in accordance with the scheduling requirements of the participating intermittent resource program. (ISO Tariff § 4.8 and Appendix Q)

<sup>2</sup> An eligible intermittent resource is a generating unit that is powered by one of the following sources, allowing for a de minimus amount of energy from other sources: 1) wind, 2) solar energy, or 3) hydroelectric potential derived from small conduit water distribution facilities that do not have storage capability.

- Reduce the threshold for reporting a forced outage of an eligible intermittent resource with total capacity of greater than 10 MW from the current outage capacity level of 10 MW to one MW. Thus, eligible intermittent resources with total capacity less than 10 MW will not have a forced outage reporting requirement, but eligible intermittent resources with total capacity greater than 10 MW must report forced outages impacting one MW or more of their capacity. This new requirement will apply to all EIRs greater than 10 MW that have executed a PGA or QF PGA. The ISO is not proposing to change the obligation imposed on all generating units, including eligible intermittent resources, to submit a more detailed report *explaining* any forced outages of 40 MW or more.

The first modification ensures that the ISO will have access to the data necessary to forecast the expected output from resources with intermittent production whether or not a resource participates in the PIRP. As a result, the ISO will not be unduly limited by commercial considerations involved in PIRP participation and will be able to gain an appropriate level of visibility over intermittent resources necessary to maintain reliability and operate efficient markets. The second modification eliminates a significant source of forecasting error by ensuring the ISO will have accurate information regarding the capacity actually available to produce electricity during the time frame of the operational forecasts.

The ISO, working with stakeholders also has refined the requirements for the forecasting and communications equipment applicable to wind and solar resources, respectively. No additional tariff changes are required to implement these new requirements, other than those already discussed. The existing *Eligible Intermittent Resource Protocol, Appendix Q* to the tariff (EIRP), currently imposes a general obligation on participating intermittent resources to comply with forecasting protocols and equipment requirements that the ISO may specify through a business practice manual (BPM) or ISO website. As noted above, the proposed tariff changes simply are intended to expand that obligation to all interconnecting eligible intermittent resources. Given the existing tariff authority to identify requirements, refinements to the forecasting and communication equipment specifications will not be expressly included in the tariff changes. Instead, they will be appropriately incorporated into a BPM in accordance with accepted ISO practice. As such, the forecasting and communication equipment requirements will be reviewed by Management and the ISO Board of Governors as part of the BPM change management process. A Management proposal to revise the BPM for Market Operations is pending and will likely be included in the routine BPM report at the next regularly scheduled Board meeting.

## **RECOMMENDATION**

Based on the analysis set forth herein, Management recommends that the Board approve the following motion:

***Moved, that the ISO Board of Governors approves the proposed tariff changes regarding (1) enlarging the applicability of the forecasting and communication equipment and data requirements of the Eligible Intermittent Resource Protocol to specified Eligible Intermittent Resources***

*and (2) reducing for Eligible Intermittent Resources the threshold for reporting Forced Outages from 10 to one MW, as detailed in the memorandum dated October 21, 2009, and;*

*Moved, that the ISO Board of Governors authorizes Management to make all of the necessary and appropriate filings with the Federal Energy Regulatory Commission to implement the proposal.*

## **DISCUSSION AND ANALYSIS**

### ***Expansion of applicability of the forecasting equipment installation and data communication requirements***

Management anticipates that most, if not all, new intermittent wind and solar capacity will elect to become a participating intermittent resource. Nevertheless, Management believes that, even if a particular intermittent resource decides not to participate in PIRP, the resource should communicate vital forecasting data to the ISO for use in maintaining reliable and efficient operations. Utilities will need to access approximately 8,000 MW of additional renewable resource capacity in order to achieve the State's 20% renewable portfolio standard goal. Significantly more renewable resources will be needed to achieve a 33% renewable portfolio standard. If the ISO lacks visibility regarding the anticipated production from this large amount of intermittent resources, the ISO will face an unacceptable reliability risk. Management, therefore, is proposing that all eligible intermittent resources that have executed a PGA or QF PGA be required to meet the forecasting data gathering and communication requirements of the Eligible Intermittent Resource Protocol (EIRP)<sup>3</sup>, subject to exemptions for certain wind resources. In that regard, wind facilities with existing or approved meteorological station tower configurations prior to the effective date of the proposed tariff change would not be compelled to alter those configurations. Similarly, those wind resources without an installed nacelle anemometer as of the effective date of the proposed tariff changes would not be obligated to retrofit.

The ISO is incorporating the forecasting equipment and communication data requirements in the Eligible Intermittent Resource Protocol. Under the existing EIRP, only those eligible intermittent resources that elect to become a participating intermittent resource must be certified, and this imposes the various forecasting and communication requirements on the resource. This would change under the modifications proposed by Management. All eligible intermittent resources, regardless of whether they are certified as a participating intermittent resource, and unless otherwise exempt, would be subject to the substantive forecasting equipment and data provisions of the EIRP. However, some sections of the EIRP, such as those relating to scheduling and settlements, and to PIRP monitoring would not apply unless the eligible intermittent resource elected to be certified as a participating intermittent resource.

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<sup>3</sup> ISO Tariff, Appendix Q.

### ***Lowering of forced outage threshold requirement***

Section 9.3.10 of the ISO tariff governs the reporting of forced outages. That section requires the operator of a generating unit to report an unanticipated forced outage that reduces the capability of the generating unit by the greater of 10 MW or 5% of the generating unit's maximum value, to the extent the forced outage lasts longer than 15 minutes. In addition, where the operator has to remove from service, or reduce the output capability of, a generating unit by 10 MW or more to prevent a likely forced outage within the next twenty-four hour period, the operator must similarly notify the ISO. Management believes that, given the significant variability of intermittent resource production and the expected significant increase in the amount of intermittent resource capacity that will be interconnected to the grid in the future, a 10 MW threshold for triggering the outage reporting obligation conflicts with the goal of reliable and efficient grid operations.

Forecast service providers must have accurate information on the output capability of eligible intermittent resources in order to provide accurate energy forecasts. Their forecasting algorithms must accurately reflect the eligible intermittent resource's characteristics. Unknown changes to the eligible intermittent resource's energy availability will affect the forecast. Accordingly, the absence of an obligation to report forced outages of less than 10 MW may lead to significant errors in forecasting the production of eligible intermittent resources.

In order to address this situation, Management proposes to alter the reporting threshold for forced outages from 10 MW to one MW for those eligible intermittent resources with total capacity greater than 10 MW. Small eligible intermittent resources with less than 10 MW of total capacity will be exempt from the forced outage reporting requirements. Additionally, the obligation will apply on a generating facility, not a generating unit, basis. This change accounts for the fact that many eligible intermittent resources may be composed of many small or modular generating units that individually are less than 1 MW in size. Consequently, under the prior language such eligible intermittent resources would fall outside the express scope of the reporting obligation. The forced outage reporting requirements for all conventional, *i.e.*, non-EIR, generating units will remain unchanged.

### **POSITIONS OF THE PARTIES**

Each proposed tariff modification elicited one primary concern from stakeholders. With respect to the expansion of the forecasting equipment and communications requirements, Management proposes to charge all eligible intermittent resources the forecast fee currently assessed only to participating intermittent resources. The ISO levies a forecast fee in order to pay the costs of the ISO's forecasting service provider. CalWEA objects to application of the forecasting fee to those eligible intermittent resources that do not voluntarily choose to participate in the Participating Intermittent Load Program and as such do not receive PIRP's benefits. The tariff currently provides that the ISO may assess a charge up to \$.10 per MWh on the metered energy from participating intermittent resources as a forecast fee. However, the amount of the forecast fee is limited to the level necessary for the ISO to recover its projected annual costs related to developing energy forecasting systems, generating forecasts, validating forecasts, and monitoring forecast performance for the Participating Intermittent Resource Program. To determine the current forecast fee, the aggregate program costs incurred by the ISO are divided by the projected annual energy production of all participating intermittent resources. Several factors support Management's proposal. First, the

burden on reliable system operational that results from variable output is unaffected by the resource's decision whether or not to become a participating intermittent resource. The ISO's need for visibility and accurate forecasting is triggered by the intermittent resource's choice to interconnect to the ISO's balancing authority area. Given this direct causation, Management believes it is appropriate to apply the forecast fee to all eligible intermittent resources, rather than manage this reliability impact through the ISO's operating budget as it does, for instance, for load variability. Second, over time the per MWh charge will drop significantly as more energy is produced, not just from participating intermittent resources, but also from other eligible intermittent resources. This mitigates the expected financial impact of the proposal. Accordingly, this fact, along with the potential impacts of new intermittent resources on reliability and operational efficiency, justifies the extension of the forecast fee to all eligible intermittent resources.

Several stakeholders also opposed lowering the forced outage reporting threshold to one MW for eligible intermittent resources. Instead, several stakeholders felt that a 10 MW threshold was more reasonable. Management declined to alter its position for several reasons. First, the stakeholder position is, in large part, based on a misunderstanding of the reporting burden, which is minimal. The scheduling and logging system (SLIC) for the ISO allows for the automated reporting of forced outages. Second, setting a 10 MW threshold could exclude small-scale photovoltaic resources. However, given the potential proliferation of such resources and the significant aggregate capacity such resources will have, the ISO must maintain sufficient visibility as to the production capabilities of such resources to maintain reliable and efficient grid operations. Third, given the inherent variability of fuel-constrained renewable resources, Management anticipates incorporating forecasts of their output into market commitment and dispatch systems. As a consequence, greater precision and greater accuracy in the forecasts will promote more efficient market outcomes.

## **MANAGEMENT RECOMMENDATION**

The ISO anticipates a significant increase in reliance on intermittent resources, such as wind and solar generating facilities, to satisfy California's future demand for electrical energy. The variable nature of these resources poses challenges to reliable system operation. An increase in forecasting accuracy constitutes a critical means to address these challenges and enhanced data quality is fundamental to achieving that objective. To improve data quality received from all intermittent resources, Management recommends:

- Extending the scope of resources subject to the obligation to install specified forecasting and telemetry equipment and to communicate relevant data to the ISO, and
- Reduce the threshold for reporting a forced outage of an eligible intermittent resource with total capacity of greater than 10 MW from the current outage capacity level of 10 MW to one MW.