**UNITED STATES OF AMERICA**
**BEFORE THE**
**FEDERAL ENERGY REGULATORY COMMISSION**

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| **Imbalance Provisions for Intermittent Resources Assessing the State of Wind Energy in Wholesale Electricity Markets** | **Docket Nos. RM05-10-000 AD04-13-000** |

# OPENING COMMENTS OF THE CALIFORNIA INDEPENDENT SYSTEM OPERATOR CORPORATION IN RESPONSE TO NOTICE OF PROPOSED RULEMAKING

Pursuant to the Notice of Proposed Rulemaking ("NOPR") published in the Federal Register on April 26, 2005,[1] the California Independent System Operator Corporation ("CAISO") respectfully submits the following comments regarding the Federal Energy Regulatory Commission's ("Commission") intention to include an intermittent generator imbalance service schedule in the open access transmission tariffs ("OATT") of public utilities.

## I. Introduction

The CAISO concurs with the Commission's conclusion that distinct generation imbalance provisions must be adopted to accommodate the special characteristics of intermittent resources if they are to compete on a comparable basis in electricity markets with other forms of generation. The NOPR correctly recognizes that weather-driven conditions beyond the intermittent generator's control will cause frequent deviations between the generator's output and its schedule. Under these circumstances, the CAISO agrees that the application of

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[1] *Notice of Proposed Rulemaking: Imbalance Provisions for Intermittent Resources Assessing the State of Wind Energy in Wholesale Electricity Markets,* RM05-10-000, 70 Fed. Reg. 21349 (April 26, 2005).

the same generation imbalance rules appropriate for resources with a controllable energy source will result in significant imbalance charges that erect potential barriers to the development and market participation of intermittent technologies.

The NOPR's proposed solution involves adoption of an intermittent generator imbalance bandwidth where deviations within +/-10 percent of the generator's schedule for each generating hour will be priced at the transmission provider's system incremental price for the deviation period. Only net hourly deviations in excess of the bandwidth will be subject to imbalance pricing. In selecting this solution, the Commission implicitly expresses a preference for the NOPR bandwidth methodology over the Commission-approved CAISO Participating Intermittent Resource Program ("PIRP").[2] PIRP, while similar by its spirit and objectives to the solution in the NOPR in many ways, exempts intermittent generators from hourly imbalance penalties completely and utilizes monthly netting of imbalances in the settlement process.[3]

The California ISO PIRP is a proven concept that has been fully operational for almost one year. There are already 10 participating resources in PIRP with capacity of about 450 MW. Eight new participants are expected to join the program in 2005. As the NOPR acknowledged, PIRP "is an example of tariff

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[2] See, *California Independent System Operator Corp.,* 98 FERC ¶ 61,327 (2002) ["With this proposal, the Cal ISO provides a fair and effective means of accommodating the scheduling needs of intermittent generation, while avoiding imposing additional costs on other market participants."].

[3] PIRP originated in July 2001 after direction from the CAISO Board of Governors to work with representatives of the California Wind Energy Association, the American Wind Energy Association, the Independent Energy Producers Association, the California Department of Water Resources, the Governor's office, investor-owned utilities and other interested parties. PIRP represents a consensus proposal from this working group.

reforms that could facilitate wind development."[4] In fact, the California Public Utilities Commission submitted comments extolling PIRP as "a key tool" in allowing intermittent resources to "operate competitively in California" and to contribute to the State's renewable portfolio standard.[5] Other diverse entities, such as the American Wind Energy Association and San Diego Gas & Electric Company, similarly expressed support for PIRP.[6] As explained below, the CAISO believes that PIRP is superior in several respects to the NOPR proposal, and asks the Commission to explicitly endorse the general principles underlying PIRP and incorporate them into any final pro forma intermittent generator imbalance tariff.

In addition to, or as part of, describing PIRP principles, the CAISO also addresses other specific areas on which the NOPR solicits comment, including: (1) the proposed definition of intermittent resource and (2) what reliability impacts intermittent generator imbalances and scheduling flexibility may have on the operation and reliability of the transmission providers system.

## II. The Commission Should Explicitly Allow Parties to Adopt the CAISO's Participating Intermittent Resource Program or its Equivalent

The NOPR expressly invites interested parties to comment on any "alternative proposals that the commenters may wish to discuss."[7] The CAISO believes that its PIRP represents a superior, viable and proven alternative to the

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4 NOPR at 21350, fn. 11.

5 *Id.* at 21355.

6 *Id.* at 21354-21355.

7 *Id.* at 21360.

NOPR's Schedule XYZ for some transmission providers. As such, PIRP either should be included in the Commission's final rule as an option available to transmission providers, or, at a minimum, certain principles underlying PIRP should be included as a guide to transmission providers in designing variations that are "consistent with or superior to" the terms of the pro forma OATT.

### A. Principles for an Intermittent Generator Imbalance Service

1) The transmission provider develops a technology-specific definition of eligible intermittent generators reflecting regional and local considerations.

2) Eligible intermittent generators may elect to be participating intermittent generators in a voluntary program[8] with the transmission provider to develop an unbiased, near real-time forecast of hourly energy generation.

3) Participating intermittent generators must schedule in accordance with the hourly forecast.

4) Imbalances by non-participating intermittent generators are priced in accordance with the transmission provider's standard schedule for generator imbalance service.

5) Imbalances by participating intermittent generators would be aggregated and netted across a calendar month or other period of time, and such net monthly deviations would be priced at the locational monthly average price.

6) A fee to defray the cost of forecasting may be imposed, and other charges for Regulation or balancing service may be assessed, depending on the

[8] The CAISO notes that a necessary outcome of the Commission's final rule should be a clear statement that in those regions with an acceptable voluntary intermittent generator imbalance service that varies from the pro forma tariff, the pro forma tariff does not provide an alternative or default service should the intermittent generator elect not to participate in the voluntary program. Permitting intermittent resources to choose between two intermittent imbalance service schedules would be overly burdensome on the transmission provider and unnecessary under the rationale of the NOPR. The NOPR recognizes that many current "imbalance tariff provisions … have become outdated and have become unjust, unreasonable, unduly discriminatory or preferential." (NOPR at 21349.) By providing the option for intermittent resources to opt into a just and reasonable imbalance service, the transmission provider is removing the unjust, unreasonable, discriminatory or preferential impact of other applicable imbalance services that may create a competitive barrier.

level of penetration of intermittent generators in the transmission provider's balancing area, as may be approved by FERC.

### B. Discussion of CAISO Proposed Principles

#### 1. CAISO Principles Are Superior to NOPR Terms in Several Respects

The principles that underlie the CAISO's PIRP offer important advantages over the terms proposed in the NOPR. First, the PIRP does not rely on an arbitrary deviation band such as that proposed under the NOPR and, therefore, provides a more effective means of assuring that no undue discrimination against eligible intermittent generators occurs in settling imbalances. Using a fixed deviation band implicitly assumes that variability in deviations driven by uncontrollable factors such as weather is constant, from one hour to the next. This assumption is unfounded. Variability will be greater in some hours than in others, depending on the technology, the location, the season and other unsystematic differences. The PIRP recognizes these differences in variability by simply requiring the participating resources to schedule in accordance with the near real-time forecast, which is based on the best available information. Under some conditions, a 10 percent bandwidth may be excessive, while in other cases it may be unreasonably narrow. Under PIRP, any deviations from schedule are by definition reasonable, since the resource is scheduled in accordance with the best available information.

The NOPR fails to establish reasonable obligations on intermittent generators receiving the benefits of the proposed balancing service. In contrast, PIRP establishes requirements for providing real-time telemetered information on

unit status, and variables relevant to forecasting energy production (i.e., temperature, wind speed, humidity). This information supports the development of professional, near real-time energy forecasts, which both define the schedule that a participating intermittent generator is required to submit, and provide the transmission provider with valuable updates on expected changes in generation by intermittent generators. With this information the transmission provider can anticipate potential transmission overloads or system imbalances. Additionally, PIRP requires intermittent generators to help shoulder the financial burden imposed on the system by requiring payment of a forecast fee.

A final benefit of PIRP is that the program is voluntary. Any eligible intermittent generator that is able to make technological or commercial arrangements to store Energy or other capacity to balance unscheduled deviations is free to undertake those initiatives. In summary, transmission providers should be allowed to undertake a program like PIRP since it offers several advantages to the NOPR proposal.

**2. Definition Should Be Technology-Specific**

The NOPR requested comment on the proposed definition of intermittent resources. The NOPR defines an intermittent resource as "an electric generator that is not dispatchable and cannot store its fuel source and therefore cannot respond to changes in system demand or respond to transmission security constraints."[9] This is a characteristic based definition. The PIRP principles, as reflected in the ISO Tariff, include a technology-specific definition of eligible intermittent generators. The ISO Tariff defines an "Eligible Intermittent Resource

[9] NOPR at 21349, fn. 1.

as “a Generating Unit that is powered solely by 1) wind, 2) solar energy, or 3) hydroelectric potential derived from small conduit water distribution facilities that do not have storage capability.”

The CAISO recognizes that the NOPR definition focuses on characteristics in a likely effort to be durable by encompassing potentially unforeseen technological innovations that nevertheless exhibit the attributes warranting special treatment, i.e., nondispatchable and cannot store its fuel. This definition is satisfactory under the NOPR’s assumption that “the penetration of these resources for most transmission systems will be relatively small” such that “variations in output caused by these entities should be easily managed and not unduly threaten system reliability.”[10] For California, the operational issues observed with the currently installed 2100 MW of wind capacity are not trivial and will only be exacerbated upon compliance with the state’s RPS goal of meeting 20% of energy needs with renewable resources by 2010.[11]

The “all or nothing” nature of the NOPR definition creates a potential disincentive for marginal improvements in output flexibility or the feasible use of energy storage technologies that do not alter the fundamental intermittent nature of the resource. Yet, to address the operational challenges confronting California, the CAISO must not only develop new concepts for automatic generation control and dispatch of controllable resources to mitigate the impact

[10] NOPR at 21351.

[11] See, *Southern California Edison Company,* Docket No. EL05-80-000. In this proceeding, Southern California Edison has sought a petition for declaratory order on various issues related to its proposed Antelope Transmission Project, which is intended to interconnect 1100 MW of wind generation in the Tehachapi and Antelope Valley area of California. In total, the potential wind power generation in the Tehachapi region is estimated in excess of 4,000 MW. (See, *Report of the Tehachapi Collaborative Study Group*, CPUC Docket No. I.00-11-001 (March 16, 2005).)

of the variability of intermittent generation output, but it must also explore the use of energy storage technology to shift off-peak energy production to peak periods and increase its ability to reduce power output during over-generation periods. A technology-based definition along the lines included in the PIRP will allow the incremental implementation of these solutions without the loss of the benefits associated with the intermittent imbalance service schedule.

### 3. Authority to Impose Regulation and Other Charges

A related principle not addressed in the NOPR because of the assumption regarding limited market penetration is the authority for the transmission provider to assess charges for additional Regulation services that must be procured to accommodate the variability of wind generation resources. There is also an impact on the amount of supplemental energy that must be dispatched within an operating hour as part of the load following service required to keep the system in balance. Methodologies for calculating the added burden for Regulation and load following are still being tested and validated, but should be recognized by the Commission as consistent with cost causation principles.

### 4. Centralized Forecasting

Unlike the NOPR, which is silent on the development of the intermittent resource forecast, the PIRP directly requires participating intermittent resources to schedule their production based on a centralized state-of-the-art forecast service. This requirement serves several salutary purposes. First, the centralized forecast promotes collaboration from participating resources who must provide real-time meteorological and production information to the CAISO

as well as capacity derate information. Availability of this information increases the overall situation awareness at the CAISO or other transmission provider and helps to increase the forecast accuracy. This, in turn, increases general predictability of wind energy production and minimizes its system impacts.

Second, and equally important, the PIRP forecast bias[12] minimization algorithm helps to minimize the imbalance cost shifts to the other market participants. Under the NOPR provisions, intermittent resources could systematically over-generate or under-generate without incurring any penalties to the extent they stay within the +/- 10% limit.

### 5. Monthly Netting Provides Advantages

Another material distinction between PIRP and the NOPR is the period over which deviations are settled. Under the PIRP provisions, the uninstructed deviations are settled over a calendar month. In contrast, the NOPR provides for settlement based on net hourly deviations. Accordingly, unlike the NOPR, PIRP does not establish any limits to deviations within a brief settlement interval and as a result will not penalize intermittent resources for short-term deviations from the schedule. The settlement of uninstructed deviations over a calendar month period also allows minimizing the settlement cash flow. Both of these effects enhance the ability of the intermittent generator to enter into competitive markets.

To appreciate the foregoing benefits of the PIRP monthly approach, it is useful to set forth some of the factors that prompted the development of PIRP. California experiences significant, frequent, and rapid ramps, both up and down,

[12] "Bias" is a sum of all deviations from the schedule calculated over one calendar month.

in its intermittent capacity. These rapid hourly, or less, fluctuations frequently operate to alter the output of wind generators by 100% or more. Forecast improvements have minimized the size of the deviations, but a deadband of +/- 10 percent is unlikely to fully protect intermittent resources from penalties under such extreme circumstances.

Similarly, in California, production from wind capacity is generally at its maximum at night during low load periods. In the spring shoulder months, most notably in April and May, California also experiences its maximum production from hydroelectric resources. This can cause over-generation conditions that not only create operational difficulties, but also lead to possible negative prices during these off-peak periods such that the wind generator has to pay the market for the energy they produced. The PIRP program significantly reduces the risk exposure to negative prices for the wind generators due to the monthly netting of imbalance energy charges. The proposed NOPR will still expose the wind generators to this risk in those locations where the market prices can become negative.

## III. Conclusion

For the reasons discussed above, the CAISO respectfully requests that the PIRP either be included in the Commission's final rule as an option available to transmission providers, or, at a minimum, that certain principles underlying the PIRP should be included as a guide to transmission providers' in designing variations that are "consistent with or superior to" the terms of the pro forma OATT.

Respectfully submitted,

***/s/ Grant Rosenblum***

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CALIFORNIA ISO

California Independent
System Operator

May 26, 2005

**Via Electronic Filing**

The Honorable Magalie R. Salas
Secretary
Federal Energy Regulatory Commission
888 First Street, N.E.
Washington, D.C. 20426

**Re: Imbalance Provisions for Intermittent Resources Assessing the State of Wind Energy in Wholesale Electricity Markets**
**Docket Nos. RM05-10-000 and AD04-13-000**

Dear Secretary Salas:

Transmitted herewith for electronic filing in the above-referenced proceeding is the Opening Comments Of The California Independent System Operator Corporation In Response To Notice Of Proposed Rulemaking of the California Independent System Operator Corporation.

Thank you for your attention to this matter.

Yours truly,

***/s/ Grant Rosenblum***
Grant Rosenblum

Counsel for the California Independent
System Operator Corporation