UNITED STATES OF AMERICA
BEFORE THE
FEDERAL ENERGY REGULATORY COMMISSION

Principles for Efficient and Reliable Reactive Power Supply and Consumption	**)** **)**	**Docket No. AD05-1-000**

COMMENTS OF ISO/RTO COUNCIL ON STAFF REPORT ON REACTIVE POWER SUPPLY AND CONSUMPTION

Pursuant to the Commission's February 11, 2005 Notice in the above-captioned proceeding, the Alberta Electric System Operator ("ASEO"), California Independent System Operator Corporation ("CAISO"), the Independent Electricity System Operator of Ontario ("IESO"), ISO New England, Inc. ("ISO-NE"), Midwest Independent Transmission System Operator, Inc. (Midwest ISO"), New York Independent System Operator, Inc. ("NYISO"), and PJM Interconnection, LLC ("PJM") hereby jointly submit comments[1] as the ISO/RTO Council ("IRC")[2] on the February 4, 2005 Staff Report on Reactive Power Supply and Consumption ("Staff Report").[3]

Reactive power issues are critically important to the industry, and the Commission is right to address them at this time. These comments address the key

[1] The members of the IRC may submit individual comments as well. The Electric Reliability Council of Texas ("ERCOT"), a member of the IRC, does not join these comments as it is a non-jurisdictional entity. In addition, Southwest Power Pool ("SPP") does not join these comments due to a pending Commission matter.

[2] The nine functioning Independent System Operators ("ISOs") and Regional Transmission Organization ("RTOs") in North America formed the IRC in April 2003. The IRC's mission is to work collaboratively to develop effective processes, tools and standard methods for improving competitive electricity markets across North America. In fulfilling this mission, it is the IRC's goal to provide a perspective that balances reliability standards with market practices so that each complements the other.

[3] "Principles for Efficient and Reliable Reactive Power Supply and Consumption," Staff Report, Docket No. AD05-1-000 (Feb. 4, 2005).

reactive power challenges facing ISO/RTO markets, and recommend principles to guide future Commission action.[4]

I. The Commission Must Focus First on Reliability

The Commission's paramount principle in this policy area should be to never compromise reliability. It is critically important that reliable transmission networks be maintained and strengthened. The August 14, 2003 blackout that engulfed much of the Northeastern United States and a substantial portion of Canada crystallized this issue, and the Commission's subsequent recommendations and actions were positive steps towards ensuring that the risks of another massive power blackout are minimized.[5]

The Commission should continue this focus in its analysis of reactive power supply and consumption, and the IRC applauds the Staff Report for recognizing this up front.[6] Reliability must remain the Commission's near-term focus.[7] While the Staff Report devotes much time to the economics driving reactive power issues, and the IRC is aware that it is important not to lose sight of economic issues, we suggest that it may be premature to seriously consider applying competitive market mechanisms to the

[4] The comments included herein supplement the comments made on behalf of the IRC at the March 8, 2005 technical conference in this docket by Michael Calimano of the NYISO.

[5] *See Policy Statement on Matters Related to Bulk Power System Reliability*, 107 FERC ¶ 61,052, *clarified*, 108 FERC ¶ 61,288 (2004); *see also* U.S.-Canada Power System Outage Task Force, *Final Report on the August 14, 2003 Blackout in the United States and Canada: Causes and Recommendations* (April 18, 2004).

[6] *See, e.g.*, Staff Report at 3 ("Inadequate reactive power has led to voltage collapses and has been a major cause of several recent major power outages worldwide.").

[7] The view that maintaining reliability is critical was supported by many of the presenters at the March 8 technical conference. *See, e.g.*, Presentation of Donald Benjamin of NERC, Transcript at 7; Presentation of Philip Fedora of the Northeast Power Coordinating Council, Transcript at 8; Presentation of Michael Calimano of the NYISO, Transcript at 28; Presentation of David Bertagnolli of ISO-NE, Transcript at 105; Presentation of John Lucas of Southern Companies, Transcript at 111-12; Presentation of John Simpson of Reliant Energy, Transcript at 118; Presentation of Mayer Sasson of Consolidated Edison Co. of New York, Inc., Transcript at 182; Presentation of Susan Ivey of Exelon Corp., Transcript at 189.

procurement of reactive power at the present time.[8] Indeed, the ISOs and RTOs have already taken a number of measures in their respective reliability planning processes to ensure that adequate reactive power will be available when it is needed. The ISOs and RTOs have looked at potential problems, and developed solutions to address them, including the types of transmission and generation solutions outlined in the Staff Report. These efforts have largely been successful, and the fact is that all IRC members have in place adequate reactive resources to maintain reliability -- there is no pending crisis in this regard.

For example, ISO-NE's load power factor correction requirement is a good example of an ISO/RTO "best practice" in terms of identifying reactive power requirements on an annual, forward looking basis with regard to the sub-areas within the regional footprint. ISO-NE oversees a process that evaluates the appropriate load power factor for load within each sub-area zone in New England, the result of which is a maximum and minimum load power factor during peak periods.[9] This analysis allows ISO-NE to determine where such reactive power problems exist, and permits local distribution to propose local solutions. ISO-NE then publishes the results of the analysis, which gives load serving entities not in compliance with the program the ability to determine the optimal solution. This process allows for the deployment of static reactive

[8] Several presenters at the technical conference supported the use of current compensation methodologies, at least in the short-term. *See, e.g.*, Presentation of Michael Calimano of the NYISO, Transcript at 33; Presentation of Robert O'Connell of Williams Power Company, Inc., Transcript at 49; Presentation of Steven Wofford of Constellation Energy Commodities Group, Inc., Transcript at 109.

[9] This process is described in detail in comments being filed separately in this proceeding by ISO-NE and the New England Power Pool Participants Committee and in ISO New England Operating Procedure No. 17, which is available at: http://www.iso-ne.com/smd/operating_procedures/OP17_RTO_FIN.doc.

devices on the distribution system, which can be a more cost-effective solution than the installation of reactive devices on higher-voltage transmission facilities.[10]

While the ISOs and RTOs currently have adequate reactive resources, they are not complacent. The IRC members, as the Commission, place a high importance on continuing to ensure the adequacy of their reactive resources. The IRC does believe, however, that properly designed rules can improve the reactive resource planning efforts already underway, and looks forward to working with the Commission in designing the appropriate rules.

II. Any Reactive Power Requirement Should Include Several Important Features to Ensure Reliability

Whatever route the Commission takes, it is vitally important that certain features are in place to ensure reliability. First, any owner of a reactive power device connected to the bulk power system must be required to follow directions regarding reactive power production/consumption from its Reliability Coordinator ("RC") and transmission system operator. Moreover, a generator must be required to operate in voltage control mode unless directed to the contrary by its RC or system operator. Further, there is a need for improved comprehensive testing for both generators and for reactive equipment installed on the transmission system. Finally, the Commission should review the costs associated with installing reactive devices on the transmission system, and consider whether localized solutions may ultimately be more efficient and cost-effective.[11]

[10] A mechanism similar to the NE-ISO process is currently under consideration by the NYISO and its stakeholders.

[11] Several of the presenters at the technical conference endorsed this position. *See, e.g.*, Presentation of Michael Calimano of the NYISO, Transcript at 29; Presentation of David Bertagnolli of ISO-NE, Transcript at 105. *See also* Presentation of Philip Fedora of NPCC, Transcript at 11.

III. Reactive Power Assessment Should Be Based on NERC-Wide Standards that Account for Regional and Local Needs

The Commission and the industry should begin by reviewing NERC Version 0 reliability standards as the likeliest starting point for establishing continent-wide reactive power standards. These NERC standards provide voltage control guidelines, and are an important foundation upon which the Commission and stakeholders can build (and improve).

Critically, there must be sufficient flexibility in the application of these standards to meet regional needs, consistent with ISO and RTO market designs. The IRC agrees with the Staff Report that reactive power assessments should be made on a regional basis in order to ensure that localized needs are met. This is very important in ISO and RTO regions, each of which has unique regional characteristics and covers a diverse geographic base. The Commission has on other occasions noted the importance of providing ISOs/RTOs the flexibility to adapt otherwise standardized processes to their needs, such as in the generator interconnection process.[12] The same principle should be applied in the context of reactive power supply and consumption, where one region's needs and market features may differ significantly from another region. Moreover, ISOs and RTOs already assess reactive power requirements on a localized basis. As discussed above, their efforts have generally been successful in this regard, and the IRC encourages the Commission to continue to provide such regional flexibility.

[12] S*ee Standardization of Generator Interconnection Procedures and Agreements*, Order No. 2003, FERC Stats. and Regs. ¶ 31,146, at P 26 (2003), *order on reh'g*, Order No. 2003-A, FERC Stats. and Regs. ¶ 31,160 (2004), *order on reh'g*, Order No. 2003-B, FERC Stats. and Regs. ¶ 31,171 (2004).

IV. Reactive Power Needs Should Be Procured in an Efficient and Reliable Manner

The IRC supports the Staff Report's recommendation that reactive power needs must be procured in an efficient and reliable manner.[13] As the IRC stated above, the economic and reliability aspects of reactive power supply and consumption are intertwined, and it is important that the Commission design rules that promote an outcome that is both efficient and reliable.

All of the ISOs and RTOs currently employ similar processes for procuring reactive power using cost-based compensation methodologies. Most compensate generators supplying reactive power with their lost opportunity costs when their real power is reduced to produce the reactive power. Moreover, most ISOs and RTOs compensate both merchant generators and generators affiliated with transmission owners. Most ISOs and RTOs have also developed -- or are developing -- reactive power testing criteria. Finally, most ISOs and RTOs do not compensate generators incrementally for reactive power when the power factor is maintained within the established power factor range. The IRC believes that these practices meet the Staff Report recommendation that reactive power procurement be both efficient and reliable. And while there are some variations between the practices of various ISOs and RTOs, as noted in the Staff Report, these differences appropriately reflect regional diversity. As the IRC discussed above, sufficient flexibility in ISO and RTO markets to adapt continent-wide standards to regional needs is critically important. There is no reason to mandate strict standardization.

[13] *See* Staff Report at 105.

V. In the Near Term, the Commission Should Retain Current Compensation Methodologies

The Staff Report states that there are two primary options for pricing reactive power: (1) cost-based capacity payments and (2) real-time pricing.[14] The Staff Report observes that capacity payments are used in most jurisdictions. Real-time pricing is also used in most jurisdictions, for example with compensation for real power losses and opportunity costs associated with reduced real power output. However, no jurisdiction has developed a separate market for reactive resources. While not foreclosing the possibility that a well-designed market-based approach could potentially be implemented at some point, the IRC believes that continuing the current approach to compensating generators for reactive power supply is still warranted, and should be employed at least in the near- and mid-term. The IRC agrees with the Staff Report that it may take up to a decade to implement an effective real-time reactive power market.[15]

As the Staff Report recognized, the exercise of localized market power has the potential to become a significant issue if a real-time reactive power market were implemented at an early stage in this process.[16] This is because reactive power resources are only effective in the immediate area of the reactive power need due to substantially high losses as reactive power flows through the network. As a result, there is a strong possibility that local areas may be dominated by a small number of reactive power suppliers. By contrast, in real-time energy markets, the product of that market (energy)

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[14] *See id.* at 85-104.

[15] *See id.* at 111.

[16] *See id.* at 95 ("[M]ore complex approaches [such as implementing real-time pricing] may introduce technical challenges and bring with it the need for additional market power mitigation rules to achieve the potential efficiency gains."); *id.* at 97 ("[R]egulation or market power mitigation may be needed to prevent reactive power prices from reflecting an exercise of market power.").

can be transported over much longer distances. Thus, notwithstanding the tangible market power problems that exist in the real-time energy markets, and the challenges of designing appropriate and effective market monitoring and mitigation programs, the structure of the energy markets allows for the effective participation of larger numbers of energy suppliers than is realistically possible in a reactive power market. A reactive power pricing structure and related market monitoring and mitigation programs will be far more challenging to develop and implement than an energy market because of the highly localized nature of reactive power needs. In order to implement a properly functioning market design that appropriately compensates reactive power suppliers, the problems associated with local market power for reactive supply must be overcome.

In addition, the implementation of a real-time pricing structure will likely require the development of reactive power pricing zones that are similar (but not identical) to currently existing locational marginal pricing zones for the energy markets. Again, because of the local nature of reactive power needs, significant challenges remain. For example, it is most likely that far more reactive power zones would need to be established than the existing energy pricing zones. Due to these challenges, the IRC urges the Commission to act cautiously in this regard in order to ensure that any market-based approach does not lead to larger market power and design problems in the short-run.

Finally, as many presenters at the March 8, 2005 technical conference discussed, even viewing reactive power as a "market" may be misleading, and may give more weight to economic efficiency concerns than perhaps should be the case.[17] The Commission must not lose sight of the fact that the primary issue driving reactive power

[17] *See, e.g.*, Presentation of Anjan Bose, Washington State University, Transcript at 36-39; Presentation of Scott Helyer of Tenaska, Inc., Transcript at 120.

needs is the provision of a *voltage control* service. When viewed as an issue of physics, rather than of markets or resources, the impetus for designing a market around a "product" such as reactive power becomes diminished. Again, the IRC counsels the Commission to carefully consider all of these implications before considering moving to a market-based pricing structure for reactive power.

VI. The ISO/RTO Council Supports a "Beneficiaries Pay" Approach to Compensation

The Staff Report recommends that those who benefit from reactive power should be charged for it.[18] The IRC believes that this is the correct approach, and that is how ISOs and RTOs currently allocate costs for reactive power use.

Currently in ISO and RTO markets, end users -- the primary beneficiaries of reactive power services -- pay directly or indirectly for the costs of producing reactive power. Transmission reactive facility costs are reflected in transmission tariffs, based on incurred monthly charges. Generators' costs and revenues included in ISO/RTO tariffs, such as those in *pro forma* OATT Rate Schedule 2, are reflected in the cost of transmission service and, therefore, in the cost of power to the end user. And while end users are the primary beneficiaries, the IRC notes that they are not the only parties that receive a benefit from the supply of reactive power. Generators, for example, benefit from a more stable system as well, because a more stable system will result in fewer trips.

VII. Reactive Power Suppliers Must Be Compensated on a Non-Discriminatory Basis

The IRC also agrees with another key recommendation contained in the Staff Report -- that suppliers of reactive power services must be compensated on a non-

[18] *See* Staff Report at 105.

discriminatory basis.[19] This very important principle underlies Commission policy in many different areas, and it is appropriate in this context as well. No matter what entity provides reactive power services, all should be paid using a comparable compensation methodology for the same type of reactive resources. In general, the ISOs and RTOs have been compensating all similarly situated generators, regardless of whether they are affiliated with vertically integrated utilities or are independent power producers, in the same manner. Moreover, the Commission is currently reviewing a pending Midwest ISO proposal to compensate both affiliated generators and merchant generators in a comparable fashion under Schedule 2 of its OATT.[20]

With respect to transmission devices, compensation for a transmitter's reactive devices is the same as for any other transmission reinforcement/expansion asset. Regulators measuring the use of these devices can therefore ensure there is no discrimination between transmitters.

VIII. Conclusion

In conclusion, the IRC appreciates the Commission's efforts to address reactive power supply and consumption issues, and believes that the Staff Report relates important issues and provides several sound recommendations. The IRC endorses the Staff Report's basic principles, including the use of non-discriminatory compensation methodologies and ensuring that reactive power procurement is reliable and efficient. The IRC does believe that the Commission's near-term focus must be on the reliability side of that coin, however, and that the Commission should support existing ISO and RTO reactive supply and procurement methodologies that ensure the reliable

[19] *See id.* at 105-06.

[20] *See* Midwest ISO's December 20, 2004 Compliance Filing in Docket No. ER04-961-003.

transmission of electric power. To this end, the IRC also supports continent-wide reactive power standards, similar to those that NERC has in place. These standards, however, should permit flexibility, especially in ISO and RTO regions, to adapt to regional and local needs. The IRC also suggests that the Commission proceed cautiously with respect to implementing a market-based pricing structure for reactive power, at least in the near- and mid-terms.

Respectfully submitted,

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