

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

**FERC NOI ON REACTIVE POWER)
COMPENSATION)
)**

Docket No. RM22-2-000

**COMMENTS OF THE NATIONAL HYDROPOWER ASSOCIATION IN RESPONSE
TO FERC’S NOTICE OF INQUIRY ON REACTIVE POWER COMPENSATION**

Pursuant to Rule 211 of the rules of practice and procedure of the Federal Energy Regulatory Commission (“FERC” or “Commission”), the National Hydropower Association (“NHA”) submits these comments in response to FERC’s Notice of Inquiry (NOI) on reactive power compensation and market design, dated November 18, 2021. NHA is a national non-profit trade association dedicated exclusively to advancing the interests of the U.S. hydropower industry, including conventional, pumped storage and new marine and hydrokinetic technologies. NHA represents more than 250 companies, from Fortune 500 corporations to family-owned small businesses. Our diverse membership includes public and investor-owned utilities, independent power producers, developers, equipment manufacturers and other service providers.

I. Comments

Reactive power is an essential element to maintaining bulk electric reliability. As the nation’s power systems transition to more variable generation mixes, ensuring the grid has adequate reactive power capabilities will become more vital. Effective market designs and compensation mechanisms will be critical for grid operators to incent the reliable and cost-effective provision of this essential grid service. This is especially important in areas of the country where reactive power is procured by Regional Transmission Organizations (RTOs) or Independent System Operators

(ISOs). Although much of the NOI is focused on issues associated with the provision of reactive power from non-synchronous generators, NHA’s comments hope to shed light on issues faced by hydropower resources who provide stable, reliable reactive power through synchronous generators.

a. Hydropower’s provision of reactive power

All forms of hydropower (conventional, pumped storage and run-of-river) are capable of providing reactive power service. In fact, most conventional resources like baseload coal and nuclear operate at their rated power capacities, limiting their ability to provide reactive power. Hydropower resources typically operate below the +/-0.95 power factor allowing them to provide significant amounts of MVARs to maintain voltage. Indeed, a recent PNNL report found that hydropower’s reactive power capabilities are critical to the western interconnect¹. One illustrative example of hydropower’s value is its contribution to reactive power after significant grid disruptions like the tripping of a large nuclear unit. Specifically, PNNL found that “reactive power supplied by hydropower, post-contingency, was observed to be consistently greater than other resources for all combinations of seasonal and system loading conditions”². The figure below demonstrates hydropower’s essential contribution to grid stability during a large generator trip in the western interconnect. Despite hydropower representing only 25% of capacity in the western interconnect, hydro resources can provide the bulk of reactive power support during large contingencies.

¹ PNNL, *Hydropower’s Contribution to Grid Resilience*, October 2021
https://www.pnnl.gov/main/publications/external/technical_reports/PNNL-30554.pdf

² Ibid at 3.16

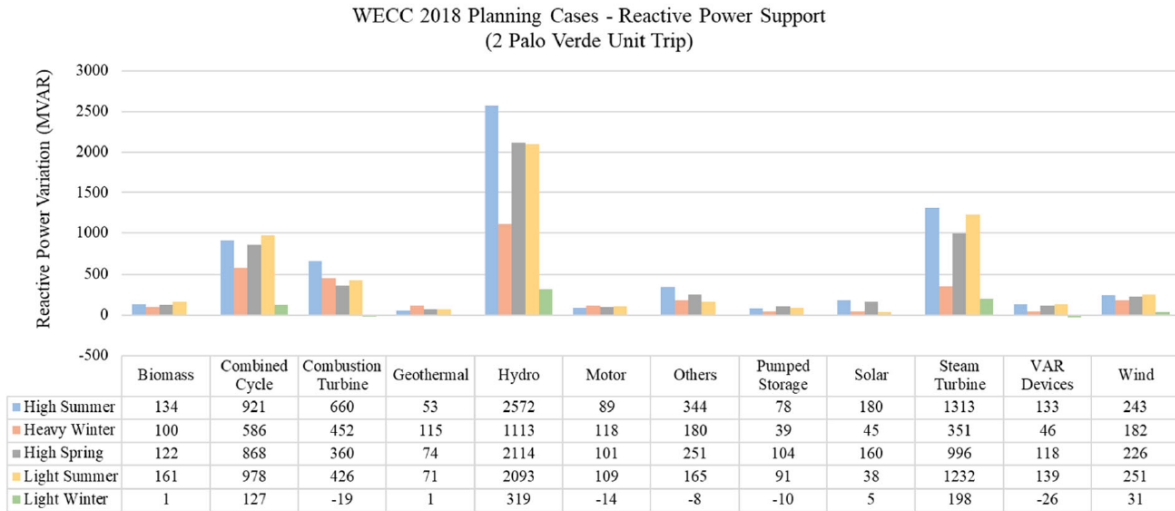


Figure 13. Additional reactive power supplied from various generation types following two Palo Verde Unit Trip contingency for 2018 WECC planning cases.

b. Reactive Power Compensation through Cost of Service

NHA members provide reliable reactive power service under several compensation mechanisms including cost of service. Hydropower owners and operators have had the following concerns with PJM’s cost of service method established under the AEP methodology.

- Time consuming and costly** – Most reactive power filings at the Commission are set for settlement and hearing. These hearings can cost thousands of dollars and last months or years to adjudicate. While this may be appropriate for some filers, the Commission’s consistent practice of requiring hearings and settlements has created a financial bar for smaller hydro owners who may not have the resources to fully litigate a rate filing. In addition, many smaller hydro generators are multi-purpose projects where the generation of power is the second or third highest objective of the facility. The Commission’s practice of sending filings to hearings and settlement has the effect of discouraging smaller projects from seeking adequate compensation for reactive power service. Even for projects with necessary

resources, the “black box” hearing and settlement process is unpredictable. From a business prospective, owners who must weigh various investment decisions over the long life of a hydro asset, have no idea how much or when revenue will be approved. This creates uncertainty for owners of hydro facilities who must choose when and where to deploy capital.

- **Accounting** – Many of NHA’s members are independent power producers (IPPs) and market based-sellers who are not subject to FERC Form No. 1 accounting standards. Indeed, most hydropower IPPs do not track their costs consistent with the uniform system of accounting. As such, it is difficult for NHA members applying for reactive power compensation in a cost-based setting to prove to Commission staff and other stakeholders their true cost of providing the service. Compounding this issue is the fact that many hydropower assets are long-life capital assets. The average age of a hydropower plant in the United States is 64 years³. When viewed solely from a book accounting perspective, these assets may appear to be fully depreciated. However, hydropower and pumped storage assets require constant investment to ensure the reliable operation over such a long time horizon. These capital investments extend the useful life of the asset, including investments related to the provision of reactive power. NHA urges the Commission to allow for accounting standards that are flexible enough to allow for longer life assets to prove their reasonable and prudent costs.
- **Testing** – Any effective testing regime should fairly assess the full potential of a facility’s technical capability of providing reactive power. NHA members have

³ EIA, Hydroelectric generators are among the United States’ oldest power plants, March 13, 2017
<https://www.eia.gov/todayinenergy/detail.php?id=30312>

experienced challenges with the testing process in PJM. For instance, in some circumstances, the coordination with PJM can be difficult. This is evident in scenarios where the testing facility must coordinate with PJM to only accept VARs from its project to fully assess the reactive power capability. The real time operations of the grid rarely can accommodate such a testing request and therefore the true potential of a facility may not be accurately judged due to no fault of the owner.

- **Existing reactive power contracts under cost of service** – Several NHA members have recently been approved rates under Schedule 2 of PJM’s tariff. NHA members strongly believe that any reform to reactive power compensation in PJM should hold these existing contracts harmless and only apply changes prospectively. NHA’s members with Schedule 2 rates spent considerable time, resources, and effort, overcoming the administrative barriers mentioned above, to receive a just and reasonable rate from the Commission. As such these reactive power suppliers should be grandfathered from subsequent changes to the compensation mechanisms. Concerns with administrative burden of Schedule 2 rates are not sufficient to undue just and reasonable rates as determined by the Commission.
- **IMM’s claim of overcompensation** – NHA members oppose the PJM Independent Market Monitor’s (IMM) contention that reactive power in PJM is double recovered by virtue of its inclusion in the E&AS offset for the reference unit in the capacity market. The PJM IMM argues that the energy and ancillary service offset for the reference unit is designed to compensate all resource who receive capacity

payments for reactive power. The IMM further argues that any payment above the \$2,199/MW-year threshold is double recovered. First, the capacity market is not the ideal mechanism to compensate for reactive power. The reliability pricing model is a complex administrative construct designed to ensure PJM has enough “capacity” to meet peak demand. There are a multitude of factors that influence capacity market results. Evolving market rules, entry and exit of resources, demand forecasting, transmission constraints and many other factors influence capacity market revenues for generators. It is not an appropriate mechanism to ensure the just and reasonable compensation of *other* grid services completely unrelated to capacity. Second, reactive power demand is very specific to location. While PJM’s capacity market has location-based prices, these prices are not granular enough to compensate for a specific generator’s provision of reactive power. Reactive power is an essential grid service that should be compensated based on reasonable costs and performance. Tying compensation to the capacity market will ensure that reactive power revenue will not be based on an individual generator’s cost or performance.

c. Reactive Power through Stated Rates

NHA members are compensated through stated rates in wholesale markets such as ISO-NE and NYISO. Stated rates can provide a more stable and predictable revenue source. In addition, the administrative burden associated with RTO-wide stated rates is much less than compared to cost-of-service ratemaking. Despite this, there is a significant compensation differential under PJM’s model versus ISO-NE or NYISO. While the process and certainty of stated rates are preferred, an RTO-wide rate may not provide the most adequate mechanism for compensation for

individual plants who may have much different reactive power capabilities. We urge the commission to consider technology-specific stated rates since capital intensive technologies like hydropower and pumped storage may require more investment than the fleet average.

II. NHA Recommendations

NHA recommends that the PJM process be improved rather than eliminated altogether. Generators should still have the option of filing cost of service or stated rates. In fact, NHA members are actively engaged in trying to find consensus for reforming reactive power compensation through the stakeholder process in PJM. We recommend the Commission allow for the PJM stakeholder process to play out before further action is taken. In addition, NHA urges the Commission not to undertake a time-intensive rulemaking process. The NOI pointed to specific areas of concern in specific regions of the country. We hope FERC focuses on those areas in need of reform rather than instituting a one size fits all approach or a broad rulemaking that will needlessly tie up stakeholder time and resources.

In addition, NHA members strongly believe that reactive power suppliers who have successfully navigated the PJM process should be allowed to keep those rates in effect should the Commission eliminate cost of service compensation. These asset owners proactively invested significant money, time and resources to provide the Commission with enough information to establish a just and reasonable rate. Any changes to reactive power compensation should grandfather those companies who have approved rates on file.

Finally, NHA members strongly oppose the IMM's contention that reactive power should be compensated through PJM's capacity market. The RPM is not well-equipped to account for the various differences between reactive power cost and performance among various technologies.

III. Communications

All correspondence, communications, pleadings and other documents related to this proceeding should be addressed to the following individuals:

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