

UNITED STATES OF AMERICA
BEFORE THE
FEDERAL ENERGY REGULATORY COMMISSION

Notice of Proposed Rulemaking)	
Third-Party Provision of Ancillary)	
Services; Accounting and Financial)	Docket Nos. RM11-24-000
Reporting for New Electric)	and AD 10-13-000
Storage Technologies)	

**COMMENTS OF THE NATIONAL HYDROPOWER ASSOCIATION ON THE
NOTICE OF PROPOSED RULEMAKING RE THIRD-PARTY PROVISION OF
ANCILLARY SERVICES; ACCOUNTING AND FINANCIAL REPORTING FOR NEW
ELECTRIC STORAGE TECHNOLOGIES**

I. Introduction.

On July 9, 2012, the Federal Energy Regulatory Commission (the “Commission”) issued a Notice of Proposed Rule Making on *Third-Party Provision of Ancillary Services; Accounting and Financial Reporting for New Electric Storage Technologies (RM11-24-000 and AD10-13-000)* (the “NOPR”). The Commission has invited comment on its proposals (i) to revise the *Avista Corp.* policy in certain respects, (ii) to require each public utility transmission provider to include OATT provisions explaining how it will determine Regulation and Frequency Response reserve requirements in a manner that accounts for the speed and accuracy of resources used, and (iii) to revise the accounting and reporting requirements under its Uniform System of Accounts in certain respects.

The National Hydropower Association¹ (“NHA”) appreciates this opportunity to comment on the proposed rules. With the appropriate market signals and regulatory structures in place, hydropower can meet its full potential to support electric reliability and the cost-effective integration of variable energy resources. The proposed rules are a step in the right direction, but additional policy changes are needed to enable energy storage to achieve the scale necessary to integrate the growing fleet of variable energy resources.

II. Ability of Conventional and Pumped Storage Hydropower Projects to Provide Ancillary Services.

Members of NHA own and operate, or are developing, both conventional and pumped storage hydropower projects. Due to their ability to rapidly increase or decrease generation on an as-needed basis, both types of hydropower are well-suited to providing ancillary services such as operating reserves and regulation services.

Pumped storage hydro and conventional hydro with reservoir storage store energy in the form of water in an upper reservoir. For a pumped storage project, excess or low-cost electric generation is used to supply pumping energy to fill the upper reservoir, usually during nights and weekends when overall system demand is low. To supply ancillary services or to meet peak loads, the stored water in both conventional and pumped storage projects can then be released through turbines to generate electricity to meet the demand. During other times of the day, both conventional hydro and pumped storage plant can rapidly respond to electric grid changes or disturbances (i.e., generating unit interruption), to assist with maintaining a reliable energy supply.

¹ NHA is a non-profit national association dedicated exclusively to advancing the interests of the U.S. hydropower industry, including conventional, pumped storage and new hydrokinetic technologies. NHA’s membership consists of more than 180 organizations including public utilities, investor-owned utilities, independent power producers, project developers, equipment manufacturers, environmental and engineering consultants, and attorneys. In 2009, NHA established a Pumped Storage Development Council to promote the benefits of energy storage and to advocate for needed changes to facilitate increased pumped storage project development.

The United States already has 40 existing pumped storage plants providing over 22 gigawatts of energy storage capacity. Most of this capacity was installed by utilities operating in a vertically integrated market before the early 1990s, although some of these projects are owned by the federal government while others have since been sold to independent power producers.

Pumped storage technology has advanced significantly since this first-generation U.S. fleet was installed. The new technology includes reversible pump-turbines and adjustable-speed pumped turbines,² which modulate the pumping power used for each unit and provide significant quantities of frequency regulation. These new plants feature fast ramping capability and can accurately manage hourly and intra-hour changes in generation, as well as second and sub-second disturbances. An additional 51,310 MWs representing over 60 pumped storage projects are in the Commission's queue for licensing and permitting (early development phase), but changes in regulation need to occur to create the market certainty required to facilitate the design and construction of these capital-intensive projects.

III. Executive Summary of Comments.

NHA generally agrees with the Commission's proposed new rules pertaining to "pay for performance" and alleviating the most problematic effects of the *Avista* doctrine. However, the Commission's proposed rule does not come to grips with a critical obstacle identified by NHA and several other commenters: the need to establish rules that facilitate long-term contracts for energy storage services and to make it easier for market participants to value and enter into such contracts. The "pay for performance" rules embodied in this NOPR and in Order 755 are a step in the right direction, because they lay the ground work for enabling markets to properly value the ancillary services that both conventional hydro and pumped storage projects provide. Modern variable speed pumped storage projects are particularly adept at providing rapid response to ancillary service needs. That said, energy storage will continue to be a small player

² In Europe and the United States, the term "adjustable speed" is usually used to describe this turbine technology. In Japan, the same technology is commonly referred to as "variable speed."

relative to its potential if it is obliged to rely on day-ahead and real-time markets for financing, as the overall project costs may prohibit investment and debt financing without long-term revenue assurances.

The NOPR does not address two important issues that need to be resolved to enable developers and existing hydro operators to plan ahead. First, the Commission should make the changes to FERC Form 1 recommended by the NHA in order to address the shortcomings of the form as applied to *current* operations of the *existing* hydro fleet. Second, the Commission should provide guidance about how energy storage will be classified, rather than address the question on a case-by-case basis.

IV. NHA Comments on the NOPR.

A. The Commission Should Develop Policies That Facilitate Long-Term Contracts with Energy Storage Owners.

NHA generally believes that the changes proposed in the NOPR will enhance the role of conventional hydro and pumped storage in the ancillary services markets. As discussed below, the Commission's proposed adaptation of the *Avista* doctrine would improve the ability of an energy storage owner to participate in ancillary services markets without having to make a burdensome (in some instances nearly impossible) showing that it lacks market power in those markets. The "pay for performance" approach contemplated by the NOPR and by Order 755 will enable ancillary services markets to accurately value resources that can respond very quickly and very accurately in order to provide energy stabilizing resources to the electric grid.

But these improvements on their own will not enable the financing of most energy storage projects, particularly grid-scale storage. Unlike the pumped storage facilities that were built before the 1990s, new energy storage facilities will be built in competitive markets in which the old rate-based regulated utility generation model no longer applies—much of the nation's energy infrastructure is now owned or being developed by independent power producers who lack utility-rate base cost recovery structures. Even where competitive ancillary services

markets have been established and reward the high performance of energy storage devices, the markets operate entirely on a day-ahead and real-time basis and do not support energy storage facilities that require capital-intensive investment and some form of long-term revenue stream. This is why NHA and several other commenters called upon the Commission to establish market rules that would allow long-term contracts between storage developers and creditworthy offtakers who can use the services that energy storage can supply.

To date, certain energy storage projects, in particular batteries and flywheels, have been developed with the assistance of federal loan guarantees or with the aid of state incentives. Other smaller-scale energy storage installations are pilot projects undertaken by utilities evaluating how energy storage will perform with intermittent resources or when used for other purposes. Recent energy storage projects have also been successfully deployed as part of several wind and solar projects in Hawaii, a unique market where transmission systems are literally “islanded” and the price of energy is significantly affected by the cost of diesel fuel.

The United States installed over 20,000 MW of pumped storage from the 1970s through the 1990s. Those plants and the other generation and transmission facilities that form the backbone of the U.S. electric grid were deployed due to the foresight of regulated utility systems planners. Utilities that built capital-intensive but very valuable pumped storage hydro projects could count on recovering their investment in a regulated market. The result was the most reliable grid in the world, operating at very competitive power rates. Unfortunately, the existing FERC market structure would not re-create the versatile, storage-rich portfolio we have today, because developers are typically not able to obtain the necessary financing to build significant amounts of energy storage. Unless market rules are changed to allow energy storage developers to enter into long-term contracts for their services, energy storage development will not be robust enough to permit the continuing integration of variable energy resources without increasing the stresses on an already strained grid.

The Commission should solicit further input on policies that would allow regional transmission organizations and independent system operators (collectively, “RTOs”), as well as

stand-alone transmission providers, to enter into long-term contracts with energy storage owners, including owners of pumped storage facilities. These long-term contracts would provide the purchaser not only with specified ancillary services for the term of the contract, but also with energy storage services that are uniquely suited to manage the growing penetration of variable energy generation. These long-term ancillary services contracts could be procured in a competitive solicitation, as contemplated by the Commission in its proposed rules addressing the *Avista* restriction. In the absence of policies that encourage or at least allow for long-term contracts, energy storage will not reach its potential in the United States and simply will not be available to facilitate the integration of significant quantities of additional variable renewable resources.

B. The Commission’s Proposals for Addressing the *Avista* Restriction.

Under the part of the *Avista* policy that is the focus of the NOPR,³ a third party generally may not sell ancillary services at market-based rates to a public utility that is purchasing ancillary services to satisfy its own open access transmission tariff (“OATT”) requirements to offer ancillary services to its own customers (for purposes of these Comments, a “Purchasing Utility”). A third party can overcome this prohibition only by providing a market power study that demonstrates a lack of market power for the particular ancillary service in the particular geographic market. NHA agrees with the Commission’s finding that “to date, the Commission has not received an acceptable market power analysis for the sale of ancillary services at market-based rates outside of RTO/ISO markets”⁴ and its conclusion that “the effect of the *Avista* policy is to categorically prohibit sales of ancillary services to public utility transmission providers outside of the RTO and ISO markets.”⁵ In doing so, the *Avista* policy inhibits the nationwide development of new energy storage facilities, as well as the deployment of existing storage and conventional hydropower into the unorganized ancillary services markets.

³ *Avista Corp.*, 87 FERC ¶ 61,223 (“*Avista*”), order on reh’g, 89 FERC ¶ 61,136 (1999).

⁴ 77 Fed Reg at 40,417.

⁵ 77 Fed Reg at 40,416.

Generally, NHA believes that the Commission’s proposals are an improvement over the existing state of affairs in the unregulated markets. However, NHA urges the Commission to re-evaluate the effect of these rules from time to time to address potential changes in market conditions and lessons learned from operations under these rules.

The Commission first proposes to apply existing market power screens to the analysis of market power for Energy Imbalance and Generator Imbalance. The Commission’s regulations would be revised to create a rebuttable presumption that a seller lacks market power with respect to sales of energy, capacity, energy imbalance service, and generator imbalance service to a Purchasing Utility if the seller passes the “pivotal supplier screen”⁶ based on (i) annual peak demand of the relevant geographic market, and (ii) a market share analysis applied on a seasonal basis.⁷ The Commission stresses that this proposal would not constitute a revision to the *Avista* policy—rather, a seller who passes these screens would be deemed to have passed the market power test and thus would not be subject to the sales prohibition otherwise imposed by *Avista*. As proposed by the Commission, this rebuttable presumption would apply *only* to Energy Imbalance and Generator Imbalance service.⁸ However, NHA supports extending this rebuttable presumption to include *all* capacity and energy related ancillary service products, including both Regulation and Frequency Response (Schedule 3) and the Operating Reserves schedules (5 and 6).

With respect to ancillary services other than Energy Imbalance and Generator Imbalance,⁹ the Commission proposes a new reporting requirement that is intended to provide

⁶ The “pivotal supplier screen” evaluates the seller’s potential to exercise horizontal market power based on the seller’s uncommitted capacity at the time of annual peak demand in the relevant market. A seller satisfies the screen if its uncommitted capacity is less than the net uncommitted supply in the relevant market. 18 CFR § 35.37(b)(2011).

⁷ 77 Fed Reg at 40,418.

⁸ *Id.*

⁹ These ancillary services are Operating Reserve-Spinning, Operating Reserve-Supplemental, Reactive Supply and Voltage Control, and Regulation and Frequency Response services. The reporting requirement and optional screen would apply to Energy and Generator Imbalance services only if the Commission’s proposal for screening those services is not finalized. *See* 77 Fed Reg at 40,419 n.48.

potential sellers of ancillary services with information needed to develop a market power analysis that uses an optional screen that applies only to ancillary services. The Commission would require each public utility transmission provider to publicly post on its OASIS information about the aggregate amount (MW or MVAR) of each ancillary service that it has historically required, including any geographic limits or system constraints (i.e., transmission congestion) faced in meeting those ancillary service requirements. The screen would then compare (i) the amount of MWs (or MVARs, as applicable) that a seller could dedicate to providing the ancillary service in the relevant geographic market with (ii) the buyer's reported aggregate requirement for that ancillary service (taking into account locational requirements imposed by binding transmission constraints or the geographic limits of Reactive Supply). A seller whose available capacity is no more than 20 percent of the reported aggregate requirement for a given ancillary service would benefit from a rebuttable presumption that it lacks market power for the ancillary service in question. This approach would provide an alternate means of demonstrating lack of market power as required by *Avista*, but it would not constitute a revision to the *Avista* policy. The NHA does not see a need at this time for the Commission to develop alternative market screens, gather additional market information through reserve posting requirements, or set sub-regional price caps, beyond those already in place for the wholesale energy market.

A seller that did not wish to perform this market power analysis would have two other options. Under either of these options, a seller could make sales of ancillary services only in geographic markets where the seller had already been granted market-based rate authority for sales of energy and capacity.

First, it could propose price caps at or below which sales of certain ancillary services¹⁰ would be allowed. The cap could either be (i) the public utility provider's existing OATT rate for the same ancillary service, or (ii) rates not to exceed the highest public utility transmission

¹⁰ Regulation and Frequency Response, Reactive Supply and Voltage Control, Operating Reserve-Spinning or Operating Reserve-Supplemental.

provider OATT rate within the relevant geographical market for physical trading of the ancillary service in question. NHA believes that such price caps may not work at peak-demand times (e.g., during long, hot periods or in major, unplanned excess or shortfall generation scenarios), will not facilitate the creation of a liquid, dependable market for ancillary service and energy storage products, and may hinder the entry of new market participants.

Second, the seller could engage in sales of ancillary services to a Purchasing Utility where the sale is made pursuant to a competitive solicitation that meets five requirements: (i) the process must be open, fair, and transparent; (ii) the product or products sought through competitive solicitation must be precisely defined; (iii) evaluation criteria must be standardized and applied equally to all bids and bidders; (iv) an independent third party must design the solicitation, administer bidding, and evaluate the bids; and (v) the solicitation must have attracted sufficient seller interest to properly discipline market price.¹¹ NHA notes that competitive solicitations may not work well for short-notice transactions.

C. Resource Speed and Accuracy in Determination of Regulation and Frequency Response Service.

Both conventional hydro and pump storage projects are well suited to provide regulation and frequency response service. Modern variable speed pump storage projects are particularly adept at providing rapid-response to these needs. All existing adjustable-speed projects and those currently under construction are located in Europe, China, India, or Japan. However, several proposed U.S. pumped storage hydro projects are evaluating advanced technology, including the use of adjustable-speed technology, which would provide the generating and storage flexibility described in Part II, above. NHA has elsewhere noted that, for adjustable-speed technology to gain acceptance in the U.S., “the added cost of adjustable-speed technology must be offset by valuation in the ancillary services market.”¹²

¹¹ 77 Fed Reg at 40,422.

¹² National Hydropower Association, *Challenges and Opportunities for New Pumped Storage Development: A White Paper Developed by NHA’s Pumped Storage Development Council 33* (2012).

The Commission proposes to require transmission providers to amend their OATTs at Schedule 3 (Regulation and Frequency Response Service) to include provisions that explain how the transmission provider will take into account the speed and accuracy of regulation resources in determining Regulations and Frequency Response reserve requirements. The Commission would also require these provisions to include a description of how the public utility transmission provider would make adjustments to the capacity requirement when a customer opts to purchase from third parties or self-supply its requirements using resources with speed and accuracy characteristics that differ from the set of resources otherwise being used for Regulation and Frequency Response Service.¹³ NHA interprets the Commission’s proposal as extending the goals articulated in Order 755 to markets outside of the ISOs and RTOs.

NHA supports the Commission’s goal in Order 755 and in this NOPR of establishing “pay for performance” standards that recognize the difference between fast-responding, accurate resources like adjustable-speed pumped storage hydro and conventional hydro, versus conventional thermal resources that ramp more slowly and respond less nimbly. This approach should encourage the appropriate valuation of hydro resources in the ancillary services market. NHA also agrees with the Commission that each transmission provider will have unique needs and that a case-by-case evaluation of each proposed determination is more appropriate than imposing a mandatory methodology.

D. Accounting and Financial Reporting for New Energy Storage Technology.

The Commission states that “at this time, the proposed accounting and reporting rules do not impose additional accounting or reporting requirements for hydroelectric pumped storage plant[s].”¹⁴ The Commission explains that the existing accounting and reporting standards use subaccounts for pumped storage under the functional classification of “production,” and that no

¹³ See generally 77 Fed Reg at 40,423, 40,432.

¹⁴ 77 Fed Reg at 40,426.

pumped storage developer has successfully demonstrated a non-“production” use to the Commission to date.

However, NHA’s comments in this proceeding did not just address the application of FERC Form 1 to *future* pumped storage deployments, but the shortcomings in the way FERC Form 1 treats *existing* pumped storage hydroelectric plants *as they are now used*. Although some parts of FERC Form 1 do a satisfactory job with respect to hydropower installations, other parts do not work for pumped storage hydro projects. Suggested improvements and NHA’s reasons for requesting them are as follows:

- FERC Form 1, Pumped Storage Generating Plant Statistics, Line 6: “Plant hours Connect to Load while Generating.” The total hours an energy storage facility is synchronized and connected to the grid are important to identify. A pumped storage station’s effectiveness is based on its total “utilization factor,” which is the sum of hours generating, pumping, and condensing. NHA recommends the Commission change line 6 to read “Plant hours Connect to Load.” This would include all hours synchronized to the grid. If further detail is required, then the Commission should consider adding two line items to capture the “Plant hours Connect to Load while Pumping (charging)” and “Plant hours Connect to Load while Condensing.”
- FERC Form 1, Line 38: “Expenses for KWh (line 37/9).” This is an incorrect calculation to determine the true cost and representation of the operations and maintenance (“O&M”) expenses of pumped storage facilities. NHA recommends that the calculation be changed to include the pumping (or charging) hours to the calculation as follows: “Line 37/ (9+10).” NHA concurs with the Commission that the asset class cost accounting for pumped storage facilities in lines 13 through 35 of FERC Form 1 is satisfactory to capture accurately the capital and O&M costs for pumped storage facilities. However, these costs also include the incremental capital and O&M costs of the equipment required to allow reversible pump turbine operations, further supporting the logic above in including all pumping energy plus generation energy in the \$/KWh

calculation. This is not a pumped storage developer issue; it is an industry issue to create a more accurate database for benchmarking and O&M cost studies. Without this added information, the studies will be flawed.

In its discussion of the use of existing pumped storage resources to arbitrage the difference between the sales price of on-peak and off-peak electricity, the Commission noted that purchases of power for resale are to be recorded at cost in Account 555, Purchase Power, and concluded that “this account may sufficiently provide for the recording of the cost of electricity stored in storage operations that is sold in wholesale electricity markets.”¹⁵ NHA notes that line 36 on FERC Form 1 accounts for “Pumping Expenses,” and the pumped storage industry understands that the cost of pumping energy is to be included on this line. If the Commission changes the accounting for pumping (or charging) energy that is sold in wholesale electricity markets for energy storage facilities, the Commission should apply the same standard to pumped storage facilities.

The Commission also inquired in its NOI whether power purchased to attain a state of initial charge should be accounted for as a base charge and included as a component cost of energy storage plant and equipment, asking whether there are any alternative methods to account for power purchased to initially attain a state of charge.¹⁶ NHA believes that there needs to be a new accounting mechanism to account for the energy required for initial unit testing and commissioning. In particular, for closed-loop pumped storage projects (off of any main stem river channel), where the initial filling of the reservoirs may not be from stream flow, the first unit testing entails pumping or charging the upper reservoir in stages. At this point in the development of a project, the station is months away from being declared “commercial,” and this required unit testing demands energy from the grid in order to achieve a full upper reservoir (i.e., considered a fully charged state for a pumped storage facility). Additional unit testing is also

¹⁵ *Id.* at 32 ¶ 38.

¹⁶ *Id.* at 36 ¶ 44.

required after the state of initial charge, and the energy produced during generation testing can be deducted from the pumping energy utilized to accurately, and transparently, account for the total energy required to achieve initial state of charge and reach commercial operation. NHA believes it is entirely appropriate to account for the supply of pumping (or charging) energy during the station testing phase in the base capital cost of the project.¹⁷

The ground rules for accounting for these costs should be clarified now and not on an *ad hoc* basis so that they can be considered in hydro project planning, development, and financing. NHA urges the Commission to revisit this issue, either in connection with the current NOPR or in a future proceeding that focuses specifically on the hydro industry's ongoing concerns about the practical shortcomings of FERC Form 1.

E. The Commission Should Continue Developing Policies and Guidance Concerning the Proper Classification of Energy Storage Assets.

NHA and several other commenters recommended that the Commission create a separate asset classification for energy storage, but the Commission declined to do so. At a minimum, the Commission should provide clear guidance concerning whether and when a given storage asset will be treated as transmission, generation, or distribution. The case-by-case approach that the Commission has taken to date makes planning difficult and remains an obstacle to the use of energy storage resources by transmission planners, who may be unwilling to take the risk that a given resource may fail to qualify as a transmission asset. On the other hand, if a utility views energy storage as being essentially like transmission, it may not be willing to negotiate an energy storage bid submitted in response to a request for proposals for the sale of generation or capacity, even though energy storage can supply both (e.g., under an electricity tolling arrangement with a wind plant that generates primarily during light load hours).

¹⁷ In addition, the "initial fill" of water at a pumped storage facility is analogous to "cushion gas" or "base gas" in a gas storage facility and should be included in the capital costs of a pumped storage project.

V. Conclusion.

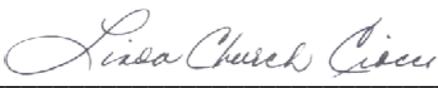
NHA generally agrees with the Commission’s proposed new rules pertaining to “pay for performance” and alleviating the most problematic effects of the *Avista* doctrine. However, the NOPR does not address three important issues that need to be resolved to enable developers and existing hydro operators to plan ahead. First, the Commission should make the changes to FERC Form 1 recommended by the NHA in order to address the shortcomings of the form as applied to *current* operations of the *existing* hydro fleet. Second, the Commission should provide guidance about how energy storage will be classified, rather than address the question on a case-by-case basis.

Finally, the Commission’s proposed rule does not address the need to establish rules that facilitate long-term contracts for energy storage services. Energy storage will continue to be a small player relative to its potential if it is obliged to rely on the day-ahead and real-time markets for financing. The Commission should revisit this issue to develop market rules that will enable energy storage to achieve the scale required to integrate variable renewable energy resources.

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Respectfully submitted,

NATIONAL HYDROPOWER
ASSOCIATION

By 

Linda Church Ciocci
Executive Director
National Hydropower Association
25 Massachusetts Ave., N.W., Suite 450
Washington, DC 20001
(202) 682-1700