

COMMENTS OF THE ENERGY STORAGE ASSOCIATION ON THE FUTURE ANCILLARY SERVICE TEAM (FAST) DRAFT NODAL PROTOCOL REVISION REQUEST

The Energy Storage Association (ESA) appreciates the opportunity to comment on the draft Nodal Protocol Revision Request proposed by ERCOT staff. ESA has actively participated in each FAST meeting and provides the following comments which we request be included in the formal Nodal Protocol Revision Request when it is proposed.

I. Introduction

As background, the ESA is an industry trade association that was established over 20 years ago to foster the development and commercialization of energy storage technologies. Since then, its mission has been the promotion, development and commercialization of competitive and reliable energy storage delivery systems for use by electricity suppliers and their customers.

ESA members represent a diverse group of entities, including electric utilities, energy service companies, independent power producers, technology developers involved with advanced batteries, flywheels, thermal and compressed air energy storage, pumped hydro, supercapacitors and component suppliers, such as power conversion systems. ESA's members also include researchers who are committed to advancing the state-of-the-art in energy storage solutions.

ESA offers comments on the policy issue surrounding the pricing and procurement of Fast Frequency Response Service and Primary Frequency Response Service. This issue has been the subject of three TAC/FAST workshops and remains a significant issue for the new suite of Ancillary Services. The resolution of this issue will greatly impact the success of the overall FAST process and the ability of new resources like energy storage to enter the ERCOT market.

ESA also offers comments on the specific provisions in the draft NPRR. Some comments focus on oversights and some focus on more substantive deviations from the concepts discussed in the FAST process. Overall, ESA believes the newly structured Ancillary Services have the potential to bring additional efficiency and flexibility to the ERCOT grid, depending on the pricing and procurement methodologies that are ultimately adopted. We look forward to continuing to work with ERCOT and the other stakeholders to create a fair and efficient Ancillary Service market.

II. Comments on Pricing and Procurement

The FAST process was designed partly to unbundle existing services into more discreet services so that the grid operators can benefit from the contribution of additional new and emerging resources, which are capable of providing additional functionality and flexibility. Among the many changes proposed, the procurement and pricing concepts developed through the FAST

process established an equivalency ratio between Primary Frequency Response and Fast Frequency Response. This ratio governs the substitution, procurement, and pricing relationship between the two services. Under this proposal, dynamic studies conducted by ERCOT established a likely ratio of 1:1 under normal conditions. However, infrequently, under certain system conditions such as high wind/low load conditions, the ratio would rise up to 2:1 or higher, reflecting the greater value to the system of fast response under these system conditions. The concept of the equivalency ratio ensures that ERCOT has the performance it needs to maintain reliability and, in doing so, it also reflects the value of the specific services.

In addition, under this proposal, all resources providing these perfectly substitutable services receive opportunity costs. Opportunity costs are provided today to all resources (load and generation resources) participating in the Ancillary Service market or in SCED. These costs allow a resource to bid into multiple services and ensure it receives the highest payment regardless of the service for which it is dispatched. Under this concept, the ERCOT system can co-optimize and call the resource for the service it needs and the resource will not experience lost revenue as a result of the co-optimization. ESA participated in the FAST process and supports this approach to pricing and procurement.

During the TAC/FAST workshops, the issue of whether these services should be considered in separate stacks or have different pricing in the same stack was discussed. It is important to note that Load Resources and energy storage (as a Generation Resource) are likely to provide FFR, while other Generation Resources are likely to provide PFR. One alternate proposal known as “Alternative Proposal 2” would have PFR and FFR clearing in the same stack, with each service clearing at its own separate price. Resources providing PFR would receive opportunity costs, however, resources providing FFR would not. The effect of this proposal would be to ensure a significantly lower price for FFR than PFR, an unfairly disparate treatment of the specific resources providing PFR and FFR. Considering that ERCOT has deemed that FFR services are perfectly substitutable for PFR, this is an unreasonable differentiation of pricing based on the specific types of resources likely to provide the service. In fact, not only is FFR a substitute for PFR, the ERCOT equivalency ratio establishes that at times 1 MW of FFR is equal to 2 MW or more of PFR. As a result, FFR should never be priced below PFR. If this alternative proposal is adopted, there will likely be fewer, if any, new resources like energy storage entering the ERCOT market to provide FFR.

Although the providers of FFR are likely to primarily be Load Resources, energy storage is capable of providing both FFR and PFR as a Generation Resource. Even at a time when ERCOT has established that FFR would be worth twice as much as PFR, the Alternative 2 pricing and procurement proposal would pay an energy storage resource less than PFR during the same interval. This disparate pricing would deter these new resources from entering the FFR market. ESA certainly believes storage resources discharging electric power into the grid for FFR or PFR should not receive less than other generation resources providing the same or similar services. The idea of the new ancillary services design is to unbundle services needed and assure

payments for various services that reflect their actual value. ESA opposes the Alternative 2 proposal.

One additional option was presented at the September 15 TAC/FAST workshop, and is referred to as “Alternative Proposal 1”. This proposal would have FFR and PFR clear in the same stack with different clearing prices, but would ensure that FFR was paid the higher of the MCPE for PFR or the FFR clearing price (with the equivalency ratio), minus the opportunity costs. This proposal makes it more likely that these two substitutable services would receive the same or comparable prices. ESA considers this a less acceptable alternative to the FAST proposal discussed above.

ESA supports the concept proposed during FAST and supported by ERCOT staff, in which all resources providing both PFR and FFR services clear in one stack and receive the same price,-- with the equivalency ratio applied, and including opportunity costs for all participating resources. Substitutable services should not be priced in an unreasonably discriminatory manner based on the type of resource that is anticipated to participate in the specific service market. Over time, ERCOT and the stakeholders have purposefully crafted a market to ensure as much technology neutrality as possible. To differentiate pricing of substitutable services based on the specific types of resources providing those services is inconsistent with this market principle. As precedent, existing RRS compensates all resources providing the service with the same price – regardless of whether Load Resources or Generation Resources are providing the service. While ESA considers Alternative 1 as a compromise which would likely attract fewer new resources, ESA strongly opposes the Alternative 2 proposal, because we believe it would create a significant disincentive for new resources to enter the market.

As a final comment, ESA understands there is a risk presented when a resource is unable to perform its FFR obligation, and is required to replace its obligation with PFR at a higher price during times of high wind/low load system conditions. It is our understanding that the stakeholders are willing to work on a solution to this problem, and we look forward to joining in that effort. Without a solution to this risk, the exposure to higher substitution prices may thwart the ability of qualifying resources to participate in the FFR market and the market will fail to flourish.

The basis of this risk is the price cap on FFR (which is set at the \$9000/MW Value of Lost Load). No other proposed service has this price cap as a constraint. One obvious solution to the price risk for FFR resources is to remove the cap and allow the market to set the price with the equivalency ratio that ERCOT has determined is appropriate.

III. Specific Comments

A. Section 3 Management Activities for the ERCOT System

Language Proposed in 3.2.5(3)(e) Publication of Resource and Load Information:

Two days after the applicable Operating Day, ERCOT shall post on the MIS Public Area the following information for the ERCOT System and, if applicable, for each Disclosure Area from the DAM for each hourly Settlement Interval:

The aggregate Ancillary Service Offers (prices and quantities) in the DAM, for each type of Ancillary Service regardless of a Resource's On-Line or Off-Line status. For each Ancillary Service, ERCOT shall separately post aggregated offers from Generation Resources, Controllable Load Resources, and non-Controllable Load Resources. Linked Ancillary Service Offers will be included as non-linked Ancillary Service Offers;

Concern: ESA is concerned with protecting confidential market information about individual resources that participate in the ERCOT market. When a specific resource is easily identifiable through the posting of this market information, that resource is subject to competitive harm.

To be specific, energy storage resources are required to register as both load and generation. Energy storage will likely participate as a generation resource when providing FRRS-Up and as a load when providing FRRS-Down. FRRS is a sub-set of Regulation and ESA understands that any offer for FRRS will be included in the aggregated Regulation service information. While bundling that information together addresses some concern, almost all Reg-Up and Reg-Down is provided by generation resources. Since energy storage resources will be the sole provider of Reg-Down as a load resource, it will be easily identifiable. Likewise, most FRRS providers will be load, however, energy storage may be the only generation resource providing that service. Again, this specific resource type providing this specific service would be identifiable by the market.

Solution: ESA proposes that information concerning all resources offering into a service market be aggregated together and not separated by resource type as required in the protocol language above.

Language Proposed in 3.17.2 Primary Frequency Response Service (PFRS):

Primary Frequency Response Service (PFRS) is a continuous Ancillary Service intended to arrest and stabilize or maintain the frequency of the ERCOT System. PFRS is automatically deployed when system frequency deviation exceeds a predetermined threshold value. Resources providing PFRS must deliver their full PFRS capacity within 16 seconds. Resources that provide PFRS must reserve capacity for this Ancillary Service and be able to assist in arresting and stabilizing over or under-frequency excursions.

Concern: Throughout the FAST discussions, PFR has been discussed as a proportional response service. The language proposed here requires resources to "deliver their full PFRS capacity within 16 seconds".

Solution: ESA recommends that the language be clarified to reflect that this is a proportional response service.

Section 6 Adjustment Period and Real-Time Operations

Language proposed in 6.5.7.6 Load Frequency Control:

The function of LFC is to maintain system frequency without a cost optimization function. ERCOT shall execute LFC every four seconds to reduce system frequency deviations from scheduled frequency by providing a control signal to each QSE that represents Resources providing Regulation Service and by providing ERCOT's control signal to release PFRS, CRS, and SRS to SCED.

Concern: This section is the first mention of releasing PFRS to SCED. While traditional generation will be offer into SCED, ESA does not anticipate limited duration storage resources to be participating in SCED. However, energy storage resources are likely to offer into the PFRS market.

Solution: ESA requests further review by ERCOT to ensure that this SCED requirement will not constitute a barrier to entry for these new resources.

Language proposed in 6.5.7.7.1 Deployment and Recall of Regulation Service:

(7) For each Resource providing FRRS-Up or FRRS-Down, the implied ramp rate in MW per minute is such that, the total amount of FRRS must be fully available in 30 cycles.

Concern: FRRS is required to be fully available in 60 cycles. This section incorrectly requires full response in 30 cycles.

Solution: Correct the language to reflect the accurate response time of 60 cycles.

6.5.9.4.2 EEA Levels

Concern: 6.5.9.4.2(2)(a)(iv) assumes that FFRS 2 will be provided exclusively by Load Resources. While Load Resources will provide a significant amount of FFR 2, this service should be open to all resources that qualify to perform. Energy storage resources with appropriate duration and meeting all requirements should be eligible to provide this service as a generation resource.

Solution: In order to be technology neutral, this section should be reviewed to ensure that all qualifying resources can provide this service.

Section 8 Performance Monitoring

8.1.1.1 Ancillary Service and Reserves Qualification and Testing

Concern 1: This section also assumes that Load Resources will exclusively be providing FFR 2. 8.1.1.1(8) and (9) establishes specific qualification and testing requirements for Load Resources providing FFRS 2. It is unclear whether this section infers that only Load Resources will be providing FFRS 2 or is simply stating that Load Resources have specific qualification and testing requirements that must be met.

Solution 1: ESA supports language that is technology neutral so that all resources capable of meeting the requirements are allowed to provide the service. This section should be reviewed to ensure neutrality.

Concern 2- This section establishes different criteria for disqualification for FFR 1 and FFR 2. Up this point, ERCOT has ensured consistency between the two subsets of FFR 1 and FFR 2. However, this new language inserts a discrepancy in the performance metrics of FFR 1 and FFR 2. FFR 1 is called earlier and more often and, under this language, would be required to perform under a tighter band at the risk of disqualification. These higher standards for FFR 1 have not been proven necessary.

8.1.1.1(9) states that a Load Resource can be disqualified from providing **FFR 2** if it fails to respond with at least 95% or at most **150%** of its Ancillary Service responsibility. 8.1.1.1(10) states that any resource providing FFR 1 can be disqualified if it fails to respond with at least 95% or at most **110%** of its Ancillary Service responsibility.

Solution: ERCOT should reevaluate these different criteria for disqualification of FFR 1 and FFR 2 and ensure there is consistency among the performance metrics, especially for disqualification, for this service. ESA notes that under the current Nodal Protocols, the strict disqualification standard in place is the same as that proposed here for FFR 1 (namely the 110% maximum).

8.1.1.2.1.2 Fast Frequency Response Service Qualification

Concern: 8.1.1.2.1.2(2) and (3) contain the same discrepancy in performance criteria for FFR 1 and FFR 2 as discussed above. (2) and (3) These use the 95% to 150% performance numbers for FFRS 2 and 95% to 110% for FFRS 1.

Solution: ESA recommends that the FFR resources be held to the same performance band and that the changes be made in this section as well.

Language proposed in 8.1.1.2.1.2(6):

(6) A qualification test for each Resource to provide FFRS is conducted during a continuous eight-hour period agreed to by the QSE and ERCOT. ERCOT shall confirm the date and time of the test with the QSE:

Concern: It is unclear whether the test being proposed occurs within an 8 hour window or lasts for 8 hours. The test required to evaluate FFR 1 may need to differ some from the test required to evaluate FFR 2 due to the different duration and restoration requirements of the services. Due to the nature of FFR 1, which has a 10 minute maximum duration and a 10 minute restoration requirement, a test that lasts 8 hours wouldn't provide additional information to ERCOT to prove the resource's ability to perform, and would be onerous to the resource. However, a test occurring over an 8 hour period may be considered helpful in evaluating the resource's ability to providing FFR 2 since that service has longer duration and restoration requirements.

Solution: ESA believes the structure of the test could be modified to provide ERCOT the information necessary to evaluate resources for each of the FFR services. ERCOT could conduct an appropriately designed test during a shorter timeframe, like one hour for FFR 1, and satisfy its responsibility validate a resource's capability to provide each service. A longer test could be designed for FFR 2.

8.1.1.4.2Fast Frequency Response Service Energy Deployment Criteria

Language proposed in 8.1.1.4.2 (11):

(11) If any of the requirements above are not met at the QSE's portfolio level ERCOT may submit a complaint to the TRE. Individual Resources providing FFRS will also be included in the complaint. Prior to submitting a complaint to Compliance, a Resource providing FFRS will have an opportunity to provide site-specific high resolution data (at least 32 samples per second) for further analysis.

Concern: This is the first time there has been reference to FFR being provided on a portfolio basis.

Solution: ESA requests additional information on how the portfolio will work before making a recommendation or comment. Will this be modeled on the portfolio approach used in Regulation service? Will there be participation factors? How will the portfolio work with FFR 1 and FFR 2?

8.5.1 Generation Resource and QSE Participation

Language provided in 8.5.1.1Governor in Service:

At all times an All-Inclusive Generation Resource is On-Line, its Governor must remain in service and be allowed to respond to all changes in system frequency except during startup,

shutdown, or testing. A Generation Entity may not reduce Primary Frequency Response on an individual All-Inclusive Generation Resource even during abnormal conditions without ERCOT's consent (conveyed by way of the Resource Entity's Qualified Scheduling Entity (QSE)) unless equipment damage is imminent. All On-Line Generation Resources that have capacity available to either increase output or decrease output in Real-Time must provide Primary Frequency Response, which may make use of that available capacity. Only Generation Resources providing Regulation Up (Reg-Up), Regulation Down (Reg-Down), Primary Frequency Response Service (PFRS), Contingency Reserve Service (CRS), or Supplemental Reserve Service (SRS), as specified in Section 8.1.1, QSE Ancillary Service and Reserves Performance Standards, shall be required to reserve capacity that may also be used to provide Primary Frequency Response (PFR).

Concern: This section requires generation resources that provide Ancillary Services to reserve capacity to be used for Primary Frequency Response. This is contrary to the provisions of this draft NPRR that establish a market for PFR, and contrary to the discussions in the FAST process. During the FAST process, the decision was made to only require those generation resources that offer into the PFR market to reserve capacity for that purpose. Other generation resources may be required to have their governors in service, but are not required to reserve capacity. If the protocols require the reservation of capacity, regardless of the resource's participation in the PFR market, then the market structure will be inefficient and likely fail.

Solution: ESA requests that ERCOT modify the language such that only Generation Resources that are participating in the PFR market are required to reserve capacity to be used to provide PFR.