

Below is a high-level summary of the different packages currently offered at the Primary Frequency Response Sr. Task Force. It is assumed that all packages have a primary frequency response requirement on all new units as per FERC Order 842. Please note that the summary description of the package does not include all details of that package. The intended purpose is to provide a high-level overview and highlight any key differences.

PJM proposal (Package A):

The PJM package would require existing units greater than 20 MW (with an exception process) to have PFR capability, contains a one-time capital recovery method and performance measurement to ensure capability.

IMM proposal (Package B):

The IMM package would require existing and new units greater than 10 MW (with an exception process) to have PFR capability. The IMM position is that the obligation to provide primary frequency response service should apply to all new and existing resources in order to prevent a competitive advantage to existing resources in PJM's markets. The IMM position is that the costs of PFR are already reflected as a cost of doing business in PJM markets. No additional compensation is required for new or existing resources because PJM's capacity and energy markets already provide the opportunity for compensation and recovery of costs associated with the installation, maintenance and operation of primary frequency response capability. The IMM position is that providing additional, out of market compensation to existing resources to recover costs associated with PFR is not only unnecessary, it would create an unfair competitive advantage to existing resources.

AEP proposal (Package C):

The AEP package applies PFR capability requirements on new units as well as existing units seeking material modifications related to the continued operations of the facility via a modified interconnection agreement. Existing resources are encouraged to continue providing PFR, as they are today, in a manner consistent with their current operations. Compensation for PFR capability could be sought at FERC as deemed necessary by the generation owner, however a computation methodology for compensation is purposefully undefined in this package. Related to PFR scoring performance; scoring should take place during meaningful and measurable frequency excursions, with future evolution of the scoring taking into account the inherent operational and thermal characteristics of an asset type. Resources will provide annual confirmation on whether frequency response capabilities should be available, assuming equipment not in outage, during actual system restoration. In the event a deficiency is identified from this annual data, (e.g. insufficient amount of units having operable governors capable of response during an actual restoration event or extremely low PFR performance in an area) the Transmission Owner and PJM may take alternative steps to mitigate operational risk, as identified in the system restoration plan. This could include the redirecting of initial electrical paths from units that lack sufficient PFR performance to those resources having better capability of providing PFR, or a new RFP process to seek incremental PFR capabilities in the area. PJM and the TOs would utilize this information to start restoration impact discussions, as necessary with individual generators. As a stop-gap to ensure successful implementation of this package, if the system-wide aggregate response reduces by 10% or greater the group will reconvene to analyze and suggest, as necessary, possible solutions.

Calpine proposal (Package E):

The Calpine package applies PFR capability requirements on new units as well as existing units that increase their unit capability via a modified interconnection agreement under a restoration scenario. Existing resources providing PFR are encouraged to continue to do so. This package offers a purchase of

service option in both the up and downward directions. For units meeting its own requirements, there is a one-time capital recovery method with a 10% rate of return. Units or their identified third party supplier(s) will provide annual confirmation on the ability to provide primary frequency response and dynamic reserves. Performance measurement will be based on frequency deviations of 120 consecutive seconds or more to ensure capability with reevaluation of the requirements if the system wide aggregated real-time response reduces by 10% or greater. DER resources with an ISA or WMPA after October 1, 2018 will be obligated to provide an upward primary frequency response. Resources will be exempt from performance assessment interval performance when PFR is for a downward response.