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Primary Frequency Response

AEP Package Clarifications

AEP PUBLIC

Misperceptions

We maintain that IF there is any shortage (no evidence), the current FERC Order will effectively begin to rebuild the number of generating resources with the capability of providing real-time, PFR service. The AEP package compliments this concept by ensuring adequacy and optimization during system restoration. Contrary to public assertions by PJM, the AEP package does not dismiss the important requirement of having primary frequency response (PFR) during system restoration.

- The AEP package focuses system restoration conversation where it should be - with transmission owner/operators/PJM and individual generators.
- In the event a TO discovers inadequate PFR in their local area, an RFP for primary frequency response could be issued so that the most efficient resources, that actually want to provide the service, can participate.
- This concept is the most cost-effective mechanism for obtaining services - as needed.

Misperceptions (cont'd)

- The RFP process for PFR during system restoration is a temporary concept. Why?
 - As new resources come online and existing resource upgrade, they are required to be PFR capable. This will naturally reduce the need for RFPs through a system restoration process.
- PJM states existing resources currently providing PFR will stop providing the service. Why would they? PJM has provided no evidence, but has consistently reiterated this statement.
- The AEP package is the only package that recognizes the potential future need of adequate synchronous inertial response. Although not part of the official package, the TOs should also be studying the amount of inertia that will be available to them during system restoration. Did you know that simple cycle CTs have less inertial response than a combined cycle CT? Both have much less than a coal unit. Similar RFP concepts could apply if shortages are discovered.

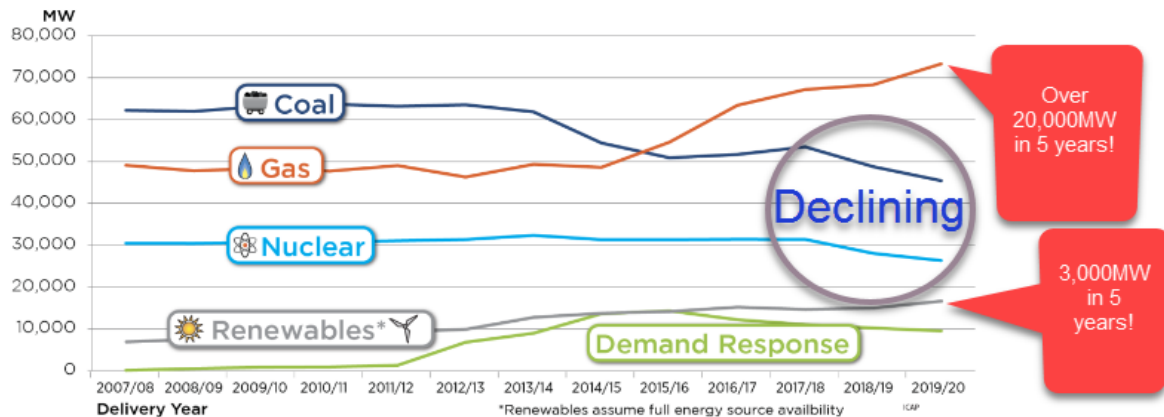
Why Invest in a Declining Resources Type?

The PJM packages will make customers pay for new investment of PFR from resources that are in decline. The AEP package which closely mimics FERC requirements does not.



PJM's Evolving Resource Mix and System Reliability

Figure 1. PJM Cleared Installed Capacity by Delivery Year



Source: <http://www.pjm.com/~media/library/reports-notice/special-reports/20170330-pjms-evolving-resource-mix-and-system-reliability.ashx>

Why Increase Inefficiency?

Certain packages under consideration will increase the cost of energy, as existing, energy optimized resources re-prioritize to provide PFR at all times.

AEP has presented evidence that even within only a limited portion of its fleet, the PJM packages will increase the cost of energy by millions of dollars. This is not an isolated issue. The PJM packages would also impact:

- CO2 emission
- SO2 emissions
- NOx emissions
- Hg emissions
- Fuel

Why? Because prioritizing frequency response will not allow generators to optimize the production of these byproducts.

This is not just a coal issue - certain aspects will apply to natural gas and oil-fired units as well.

Only During Restoration?

A PJM package states that ALL must provide during system restoration. It assumes the existence of switching capability. There is no switch! If you want PFR during system restoration, the unit must be tuned to provide it at all times. Re-tuning valves and governor action when there is a restoration event could increase chance of resource tripping significantly.

The package also suggests the need to bypass control limits that could limit a unit's ability to provide the entire range of PFR. Control loops and limits are put in place for the safety of personnel and the equipment itself (e.g. inlet temp and exhaust temp control, emissions, etc.). Eliminating control limits such as these will put the operation of units at an increased risk of tripping – at a time when the units are needed most.



Summary

The AEP package harmonizes with the existing FERC Order #842 to address the future need for resources to provide PFR and addresses the importance of having adequate PFR during a system restoration event.

It does not mandate existing units make capital investment and promote less efficient operations. Instead, it provides a competitive mechanism to address local shortages during restoration.