**TAC Emergency Conditions List**

Items/Actions Assigned to PDCWG (converted to PPT for presentation to ROS on Nov 4, 2021)

***6 Resource Telemetry: Ensure accurate exchange of Resource telemetry information related to PRC to enhance situational awareness during EEA events.***

* Consideration should be given to creating a new Resource Status for ONHOLD – this could be developed for situations of uncertainty, or trouble-shooting, on the generator side, and would provide ERCOT and PRC with better insight when a generator is experiencing issues.
* NPRR1085 is tied to this topic.
* PDCWG recommendation is to close the action item and allow NPRR1085 to work through the stake holder process.

**30 Frequency Relay Points: Analyze load shed responsibilities related to frequencies for generation and load and ensure alignment.**

* PDCWG believes our role for this action item is secondary to other groups, and that the topic closely ties to action item 45. On action item 45, PDCWG feels that our role is leading.
* PDCWG believes some collaborative discussions should be held to consider any options to modify load shed procedures. In particular, could some amount of automated load shed occur at frequency thresholds above 59.30 Hz (in relation to NOGRR 226)?
* It is possible for damage to occur to generator turbines when frequency is between 59.6 Hz and 59.3 Hz if the condition persists, or if it reaches resonance with turbines.
* PDCWG recommendation is to close the action item and allow NOGRR226 to work through the stakeholder process.

**44 Ancillary Service Products: Review existing ancillary service products and determine if existing suite of products and amounts is adequate based on lessons learned from the February 2021 winter weather event.**

* PDCWG views this as a very broad issue – it warrants continuous reevaluation and revision consideration, but changes have complicated impacts to both reliability and economics
* Ancillary Services already have planned future modifications tied to Real-Time Co-optimization and NPRR 863 (ERCOT Contingency Reserves)
* There are aspects of Energy Storage Resources, in particular, that might deserve some product/service re-design – TAC Emergency Contingency List Item 91 is directed at this topic
* PDCWG recommends closing the action item and creating a new, temporary, task force or work group to dive deeper into ERCOT’s Ancillary Service Methodology, and analyzing historical Ancillary Service allocations

**45 Frequency: Analyze system frequency leading up to EEA conditions and determine impact of low frequency on generation and load tripping.**

* Telemetry errors from generators due to rapidly developing weather conditions and grid dynamics contributed to errant PRC calculation at ERCOT; this created a negative feedback loop where errors from generators caused errors at ERCOT, which then worsened problems for the generators
* The slow frequency degradation, exhausted Ancillary Services / Contingency Reserves, and incremental load sheds resulted in a frequency value between 59.30 and 59.40 Hz for about 4 minutes and 20 seconds on the morning of Feb 15
* Any frequency value below 59.60 Hz presents some risk of damage to the generator fleet – the impacts are highly dependent upon other system conditions (voltage), the depth of the frequency excursion, and on trend-line stability (oscillations are particularly problematic)
* 24,000 MW of ERCOT generation has relay settings that trip if frequency is below 59.4 Hz for 9 min (PRC-024) – 17,000 MW of such generation was on line on Feb 15; had frequency remained low for a few minutes longer, our circumstance could have become much worse
* NOGRR 226 proposes that the first 5% of TO Load Shed relay set point be moved from 59.30 Hz to 59.40 Hz, and PDCWG members have expressed some wide ranging flexibility as to how something like NOGRR 226 might be implemented
* PDCWG recommendation is to close the action item and allow NOGRR226 and the temporary task force/work group to review the Ancillary Service Methodology to work through the stakeholder process (per Action Item 30 and 44)

**91 Could FFR play a bigger role?**

* Any additional ESR capacity (not necessarily specific to FFR) that could have been brought on line on Feb 15 could have been beneficial – as is true for any additional MW availability, from any resource
* Had some ESR devices carrying FFR been awarded and served during the Feb 15 cold weather event, that service could have been particularly valuable in that it would have delivered those MW only once the frequency dropped below 59.85 Hz
* Additional frequency trigger points for FFR could enhance the benefits of the service
* PDCWG recommendation is to close the action item and allow NOGRR226 and the temporary task force/work group to review the Ancillary Service Methodology to work through the stakeholder process (per Action Item 30 and 44)