NPRR 1255 Discussion

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Recap

- Energy Storage Resource (ESR) mitigation framework under NPRR 1255 was the product of consultations at CMWG beginning in September 2023
- Various options considered and analyzed including a design based on the CAISO model before arriving at a recommended approach
- Developing an enduring ESR mitigation design recommendation to TAC is also a requirement under protocol

Recap

- NPRR 1255 introduces a dynamic, ‘just-in-time’ mitigation framework that determines constraint contributions as a function of the maximum Shadow Price and the Shift Factor of the ESR in intervals when an ESR has been flagged for mitigation through the SCED CCT process
- Sets a very high threshold for mitigation (ESR flagged under CCT must have a large helping shift factor of at least -0.2)
- In this case the Mitigated Offer Cap is a function of the maximum shadow price for a given constraint and the ESR shift factor plus system lambda from step 1 of the SCED two-step mitigation process
- This is by definition the highest possible MOC that will allow the Resource to be dispatched in SCED to resolve the constraint (before requiring manual operator actions).
  - ERCOT performed a backcast and looking at 2023, this design would have impacted 0.34% of all intervals with 95% for one hour or less.

Available Stored Energy

- In response to stakeholder concerns around state of charge, ERCOT introduced an additional threshold to be considered before mitigation would be applied
- In addition to the previous requirements, when available **stored energy for the next hour as calculated** below falls below 25%, the MOC would revert to the SWCAP

Available stored energy

= *((current SOC – MinSOC)/(HSL*1 hour))*100*

- The conversion of SOC into available stored energy for the next hour helps to ensure that longer duration batteries only avoid mitigation when it truly has limited remaining energy.

Example 1

Case 1

100 MW/100 MWh battery with MinSOC of 0 -current SOC of 24 MWh

Available Stored Energy

= [(24-0)/(100*1)]*100

= 24%

Result: in this case the available stored energy of the ESR for the next hour was less than 25%; it **would not be mitigated** and would have its MOC set at SWCAP

Case 2

100 MW/400 MWh battery with MinSOC of 0 -current SOC of 99 MWh

Available Stored Energy

= [(99-0)/(100*1)]*100

= 99%

Result: in this case the available stored energy of the ESR for the next hour was 99%; it **would be mitigated**

Summary

- Just-in-time mitigation framework sets a very high threshold for when and how ESRs should be subject to mitigation
  - Highest possible MOC that will allow SCED to resolve congestion before requiring Operator actions
- Available stored energy provides a further filter to ensure no mitigation when available energy for the next hour as calculated falls below 25%
- A high mitigation threshold helps ensure that mitigation is rare and only when no other market options are available to manage congestion
- Post-RTC implementation
  - Greater ability to co-optimize energy and Ancillary Services to manage congestion and cost would further