



NYISO Review of the California State Agencies' Preliminary Root Cause Analysis Report for the California August Load Shed Outages

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Background

- On October 6 2020, the California ISO (CAISO), the California Public Utilities Commission (CPUC), and California Energy Commission (CEC) jointly issued a preliminary root cause report (121 pages) regarding the August 14th and 15th load shed outages.
- The NYISO reviewed the preliminary report and identified differences in practices between those employed by the referenced California agencies (“California Practices”) and those used by the NYSRC and the NYISO (“New York Practices”).

Background

- The report states that “resource planning targets have not evolved to keep pace with climate change-induced extreme weather events, and that [CAISO’s] energy market practices did not perform as intended during stressed conditions.”
- The report identifies three categories of root cause factors that contributed to the load shed outages.
- This NYISO review is focused only on the three identified root cause factors – not the entirety of differences in regulatory, RA, energy market, and operations practices between California and New York.

Root Cause Factor #1

- “The climate change-induced extreme heat storm across the western U.S. resulted in the demand for electricity exceeding the existing electricity resource planning targets.
- The existing resource planning processes are not designed to fully address an extreme heat storm like the one experienced in mid-August.”

Root Cause Factor #1 – California Practice

- RA rules are set to meet average peak demand (a “1-in-2 year” peak demand) plus an assumed 15% planning reserve margin (PRM).
- Reserve margin includes a 6% value for operating reserves, and a 9% value to account for plant outages and higher than average peak demand.
- The assumed PRM value has not been revised since 2004.
- In meeting the PRM value, dispatchable resource capacity values are based on ICAP value, non-dispatchable resource capacity values are based upon historical energy output, and intermittent resource capacity values are based upon their Effective Load Carrying Capability (ELCC) value.

Root Cause Factor #1 – New York Practice

- RA requirements are set to meet a peak demand (a “1-in-3 year” Con Ed peak and a “1-in-2 year” peak for the remainder of NYS) plus a planning reserve margin that is established *annually* by the NYSRC.
- The NYSRC process uses a probabilistic evaluation of resource adequacy to meet a 0.1 day/year Loss of Load Expectation (LOLE) reliability criterion.
- The process allows for updates to peak load forecasts, generation mix, load forecast uncertainty, transmission system changes for NY and neighboring systems, and accommodates improvements to the resource adequacy models as needed through time.

Root Cause Factor #1 – Key Observations

- NY's practice to annually establish the planning reserve margin allows for a structured annual process to account for changing factors that can impact resource adequacy requirements and is performed by an independent reliability focused organization (NYSRC).
- Arguably more important to such extreme weather events is the NYISO's Installed Capacity market design that uses a sloped demand curve in support of making additional capacity supply available in excess of established minimum resource adequacy requirements.

Root Cause Factor #2

- In transitioning to a reliable, clean and affordable resource mix, [California's] resource planning targets have not kept pace to lead to sufficient resources that can be relied upon to meet demand in the early evening hours.

Root Cause Factor #2 – California Practice

- The California Resource Adequacy (RA) rules are set to meet the highest demand period (hour) of the peak day of the operative month.
- With the increase of solar penetration in recent years, the RA rules do not sufficiently account for the second critical demand period, which is the peak of net load - net of solar and wind generation - which occurs later in the day than the peak demand hour.

Root Cause Factor #2 – New York Practice

- The NYSRC process for establishing minimum resource adequacy requirements to meet a 0.1 day/year Loss of Load Expectation (LOLE) reliability criterion considers all 8,760 hours of the calendar year
- The NYSRC resource adequacy process uses historical energy production shapes for renewable resources that is correlated with other types of renewable resources.
- Additionally, the NYISO has a process to define the period of a day that capacity resources are required to be available. The defined performance period is expected to change in the future as timeframes change to meet resource adequacy needs.

Root Cause Factor #2 – Key Observations

- New York’s practice to annually establish the planning reserve margin using a probabilistic evaluation is well suited for meeting changing resource adequacy needs occurring for all hours of a day and, importantly, all days of the calendar year. This practice is expected to become more significant through time as seasonal variations in intermittent supply and the periods of stressed system conditions are expected to change in the future.
- Additionally, the NYISO’s practice to define the period (hours) of a day that capacity resources will be required to be available and expected to perform will be important in meeting future reliability needs.

Root Cause Factor #3

- Some practices in the [CAISO's] day-ahead energy market exacerbated the supply challenges under highly stressed conditions.

Root Cause Factor #3 – California Practice

- CAISO's day-ahead energy market allowed for a significant level of export transactions to be scheduled that were allowed to flow in real-time operation on August 14 & 15 - even though there were not sufficient supply resources available to meet the forecast load. On September 5 2020, CAISO changed its day-ahead energy market software to limit the scheduling of export transactions to available supply resources.
- It is unclear as to the extent CAISO operators could have taken action in real-time to curtail certain day-ahead scheduled export transactions to avoid the need for load shedding measures.

Root Cause Factor #3 – New York Practice

- The NYISO’s day-ahead energy market includes a “reliability evaluation pass” to identify potential reliability concerns resulting from the NYISO’s forecast of load and export transactions.
- The NYISO’s market rules do not require day-ahead exports to have a curtailment priority equivalent to NYISO firm load, and therefore are not expected to flow in real-time operation during supply shortages, unless the exports are supporting external capacity sales to neighboring control areas.

Root Cause Factor #3 – New York Practice

- The NYISO has the authority to take action in both the day-ahead and real-time timeframes to curtail all export transactions scheduled in its energy markets in order to serve NYISO firm load, except for those export transactions supporting external capacity sales to neighboring control areas.
- Curtailment of scheduled day-ahead export transactions, if necessary, is well coordinated via established procedures so affected neighboring control areas are made aware of the potential reliability impacts.

Root Cause Factor #3 – Key Observations

- The NYISO's day-ahead and real-time energy markets and related operational processes are well designed to serve New York firm load requirements, and to facilitate the scheduling of NY capacity backed and non-capacity backed export transactions in a reliable manner.
- NYISO Operations is empowered to take all necessary action to manage NYISO capacity backed export transactions in both the day-ahead and real-time energy market timeframes to help maintain reliable operations during stressed system conditions.

Immediate Measures by California Agencies to Ensure Reliability for 2021

- Updating resource and reliability planning targets “to better account for heat storms and other extreme events resulting from climate change” and a “transitioning electricity resource mix to meet the clean energy goals of the state during critical hours of grid need.”
- Ensuring that generation and storage projects currently under construction are completed by their targeted dates of operation.

Immediate Measures by California Agencies to Ensure Reliability for 2021

- Expediting regulatory approval and procurement processes “to develop additional resources that can be online by 2021. This will most likely focus on resources such as demand response and flexibility”
- Coordinating additional procurement by entities not subject to California jurisdiction; and
- Enhancing CAISO markets “to ensure they accurately reflect the actual balance of supply and demand during stressed operating conditions”

Our mission, in collaboration with our stakeholders, is to serve the public interest and provide benefit to consumers by:

- Maintaining and enhancing regional reliability
- Operating open, fair and competitive wholesale electricity markets
- Planning the power system for the future
- Providing factual information to policymakers, stakeholders and investors in the power system

