Thoughts on RCA: Treatment of Atypical Equipment Outages

Ben Griffiths | Markets Committee | April 2024

LS Power: An Industry-leading Developer, Operator, and Investor

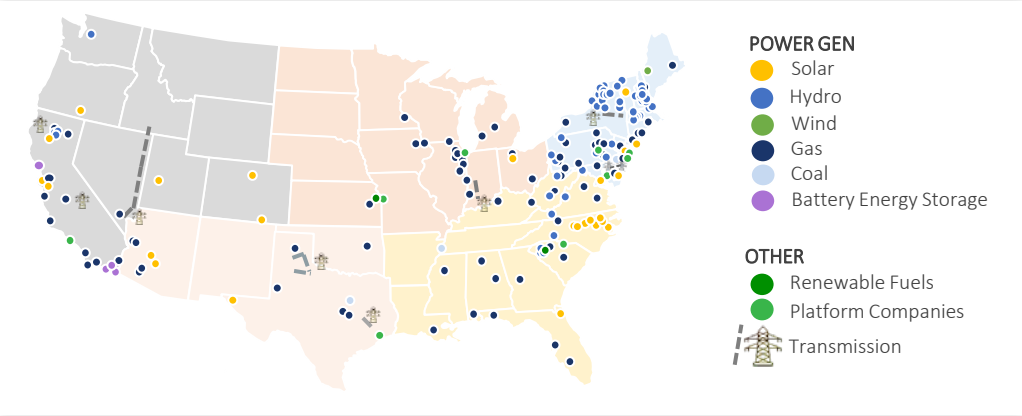
LS POWER
Innovation and Investment in Energy

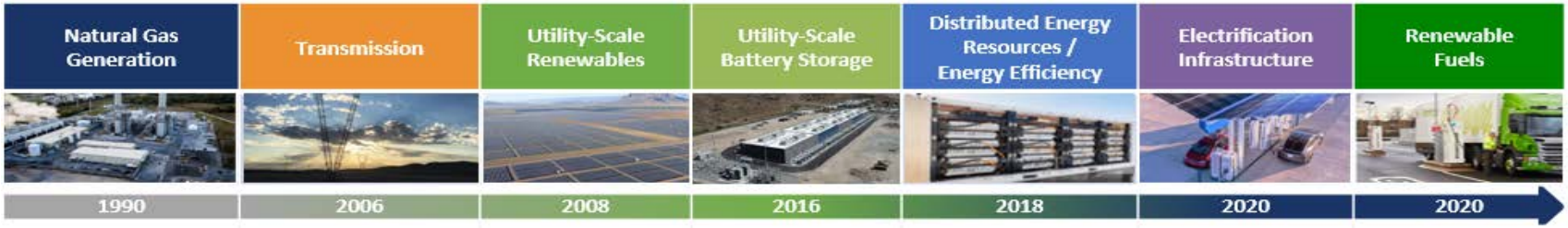
1990	Inception
>47	GW Developed and Acquired
>160	Power Generation Projects
>780	Miles of High-Voltage Transmission Completed
6	Transmission Utilities
8	Energy Services Platform Companies
>370	Professionals Across Five Offices

LS Power Group

Power Generation	Transmission	Energy Storage & Renewables

- Developed/Acquired ~50,000 MW of generation
- 16 transmission projects developed including 6 utilities across 5 ISO/RTOs and 8 states
- Nation leading energy transition businesses representing electric vehicle charging, demand response (virtual power plants), microgrids, renewable fuels and waste-to-energy platforms





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Presentation Summary

- Sometimes things break. While many forced outages are routine, others are catastrophic or otherwise atypical
- Resources can have equipment-related outages of extended duration that, once resolved, should not be expected to occur again. In these instances, *historic* performance is a poor predictor of *future* performance
- Nevertheless, the ISO's current proposal will include that outage for 3-5 years
  - For renewable resources (IPRs) and demand response (ADCR), this non-representative performance will be embedded in the unit's historic profiled generation
  - For thermal resources, non-representative performance will be embedded in EFORd
- The proposed approach is conceptually different from how outages are treated in the FCM today, and how they can be remedied using the Significant Decrease provisions
- **Proposal:** When there is either a major equipment-related outage that has since been resolved, or a material shift in resource composition, a resource should be able to challenge its default value and propose a substitute that better reflects expected output
  - Aligns new RCA performance inputs with existing Significant Decrease provisions

ISO already allows for adjustment of generator capacity values via the Significant Decrease provisions

- Today, the only thing that affects a resource's FCM Qualified Capacity value is its audited capability. Some metrics of unit performance, such as EFOR are included in FCM – but only on the demand side
- Resources can have performance-related decreases in their capability adjusted upward by the ISO in some instances, using the Significant Decrease provisions (13.1.2.2.4)
- If audited capability falls by the lesser of 10 MW or 10%, then the resource can
  - "submit a critical path schedule…describing the measures that will be taken and showing that the Existing Generating Capacity Resource…will be able to provide an amount of capacity consistent with the summer Qualified Capacity…by the start of the relevant Capacity Commitment Period"
- Subject to ISO approval, a resource can restore its FCM QC back to its expected future output
- This same logic can and should be extended to other portions of the RCA design, such as thermal xEFOR, IPR generation profiles, ADCR offer profiles. **A failure to allow for this adjustment will skew RCA results and increase consumer costs**

Three Examples: Thermal Resources

- Under the ISO proposal, thermal resources will be derated for their forced outage rate (EFOR)
  - Forced outage rates are a function of historic performance in the past 5 years
- In general, this approach makes sense, but there can be instances where it does not
- Consider a 100 MW thermal resource operating with a perfect operating history *except* for a year-long outage related to an equipment failure. After that equipment failure is resolved, the unit returns to perfect service
  - To the extent that the outage also leads to a Significant Decrease affecting seasonal QC, the ISO tariff already provides the ability to provide restoration plan documenting how the issue will be resolved
  - However, because 1 year in 5 has zero availability, it will have a forced outage rate of 20%
  - RCA will imbue that resource with an 80 MW QMRIC for the next five years (until the bad year rolls off the lookback window)
- **Is it really representative to assume that major outage will occur with same frequency going forward? No**

Three Examples: Intermittent Power Resources

- Under the ISO proposal, renewable resources will be modeled using historic output profiles
  - In general, ISO proposes to rely on hourly normalized profiles for past five years reflecting a combination of historical performance (when commercial) and simulated/proxy performance (when non-commercial)
  - Solar summer profile tied to 2021 observed performance
- In general, this approach makes sense, but there can be instances where it does not
- Consider a 100 MW renewable resource operating with a perfect (100%) output history *except* for a year-long outage related to an equipment failure. After that equipment failure is resolved, the unit returns to perfect service
  - For the failure year, renewable resource profile will show zero output
  - RCA will imbue that resource with an 80 MW QMRIC for the next five years (until the outage year rolls off the lookback window)
  - Note that for solar, this could lead to a 0 MW QMRIC is the outage year was 2021
- **Is it really representative to assume that major outage will occur with same frequency going forward? No**

Three Examples: Active Demand Capacity Resources

- Under the ISO proposal, ADCR will be modeled using a profile based on its historic offer quantity in certain intervals
  - In general, ISO proposes to rely on hourly normalized profiles for past three years. Includes a term that reflects outage rates (the "performance factor")
- In general, this approach makes sense, but there can be instances where it does not
- An ACDR resource is composed of one or more Demand Response Resources (DRRs) which are typically comprised of many smaller Demand Response Assets, or DRAs, (e.g. industrial facilities) located within a given DRR Aggregation Zone.
  - The underlying composition of an ADCR can change over time, as individual DRAs are added or removed from the portfolio
- Consider a 3 MW ADCR portfolio comprised of three 1 MW DRAs – two can produce 1 MW in all hours without any failure, one can produce zero output in all hours
  - RCA will provide that resource with a derate of 33% and a QMRIC of 2 MW
  - If the low value DRA is removed, then ACDR drops in size to 2 MW but will earn 1.33 MW QMRIC, even though it can produce 2 MW of value in practice. Reduction lasts 3 years
  - **Is it representative to assume that ADCR composition will remain constant? No**

A conceptual solution: reconstitute equipment-related outages

- Equipment issues that have been remedied (or have a credible, approved plan to remedy them) should not be carried forward, *at least in instances of major failure*
  - ADCR should be allowed similar change in instances of meaningful shift in composition
- Procedurally, the ISO should replace historic, outage-affected data with simulated/proxy performance data in the same period
  - This simulated/proxy data would need to include a representation of expected outage. For IPRs, data from DNV already includes such an adjustment
- An example: assume there is a major equipment failure that results in zero output for 1 month
  - In auction qualification process (or related window), resource would notify the ISO that a non-routine reduction that has occurred, and what was, or will, be done to resolve the issue
  - ISO would review that restoration plan or work completed to resolve the issue
  - If approved, ISO would,
    - For renewables: replace that month's actual data with simulated data from DNV or another source for that month
    - For others: adjust EFOR to remove that outage and replace with typical outage data
  - Reconstituted output would be used in RCA-based risk modeling and accreditation processes

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A caveat: need method to distinguish between routine and atypical outages

- It is not reasonable to "excuse" all outages
  - ISO-NE's current audit-based approach to accreditation fails to capture salient differences between units related to their outage rates. Shift from ICAP → QMRIC is an important advancement for accreditation in New England
- How do you differentiate between routine outages and atypical ones? Consider a 20-turbine wind farm with one step-up transformer acting as a single point of failure
  - A partial derate of 1 turbine feels like it should be treated as a routine outage
  - Loss of the transformer, by contrast, feels like it should be treated as an atypical one
- A possible solution: reconstitution only allowed if atypical outage is the greater of 10% of seasonal QC or 10 MW
  - These are the same thresholds as included in current Significant Decrease provisions
  - Perhaps there needs to be a duration or energy component as well: only outages of a certain magnitude should be contested

Reasonable Adjustments Benefit both Generation and Load

- It is in everybody's interest to have resources be represented in RCA accurately
  - Generators of all sorts should not be over-penalized for historic poor performance that should not be expected to occur in the delivery period
  - Unreasonably high EFOR values (or low output profiles) will result in higher-than-accurate Installed Capacity Requirements, increasing consumer costs
- The 3-5 year lookback period for performance estimates is generally reasonable, but there should be mechanism to allow for adjustment in certain circumstances
  - Allowing adjustment provides an incentive for generators to expeditiously repair their equipment or make other reliability-enhancing investments
- Not all failures deserve reconstitution and LS welcomes suggestions on best way to differentiate between typical and atypical outages

Questions?