RTC-RTD Convergence Analysis Overview

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December 5, 2017,Krey Corporate Center, NY

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Agenda

- Background
- Analysis conducted for study
- Overview of conclusions
- 2016 SOM recommendations
- Considerations for future work
- Next steps/Timeline
- Questions

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Background

- **Problem Statement**
  - Stakeholders and the Market Monitor have expressed concern about price divergences between RTC and RTD.
  - NYISO staff conducted an extensive analysis in 2017 to understand how often price divergences occur and what their primary drivers are.

- **Project Deliverable**
  - The 2017 deliverable for the RTC-RTD Convergence project is a completed study.
  - The study aims to identify primary causes of systematic price divergences between RTC and RTD.
  - The NYISO will publish a whitepaper by December 20, 2017 that explains the analysis the NYISO performed and includes recommendations to improve RTC-RTD price convergence.

Analysis

- **Study Period**
  - One year's worth of real-time production data was studied (July 1, 2016 - July 1, 2017)
  - This study period bridges recent market design changes.
    - Niagara Generation Modeling Improvements – May 2016
    - Lake Erie Loop flow modifications – June 2016
    - Initialization of Lake Success and Valley Stream PAR's (901/903 lines) – May 2016

- **Data and Correlations Reviewed:**
  - Magnitude and frequency of differences between LBMPs in RTC and RTD
  - Correlation between RTC-RTD congestion differences and LBMP differences
  - Correlation between load forecast differences and LBMP divergences
  - Correlation between Desired Net Interchange(DNI) changes and LBMP divergences
  - Correlation between regulation shortages and DNI changes
  - Case studies of three specific occurrences of high price divergences

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Overview of Conclusions

- **Price divergences are not a significant problem**
  - Price divergences between RTC and RTD are normally <$10 (~86% of the time).

- **No single driver of price divergences identified:**
  - Timing latency between RTC and RTD can result in price divergences when conditions change in real time
  - Weak correlations between:
    - LBMP divergences and corresponding congestion component for N.Y.C zone and PJM Linden VFT proxy
    - Load forecast differences and LBMP divergences in the fall months
    - DNI differences and LBMP divergences in any season (high correlation during certain hours)
    - Changes in DNI and regulation shortages in any season

  - Strong correlation between LBMP divergences and corresponding congestion component of LBMP in the West zone.
- **Identified overnight load forecast discrepancy between RTC and RTD**
- **Identified process improvement to accommodate Long Island PAR schedule changes**

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2016 SOM Recommendations

- **Offered potential enhancements:**
  - Add two near-tem look-ahead evaluation periods to RTC and RTD around the quarter hour
  - Adjust the timing of the look-ahead evaluations of RTC and RTD to be more consistent with the ramp cycle of external interchange
  - Enable RTD to delay the shut-down of a gas turbine for five minutes when it is economic to remain on-line
  - Better align the ramp rate assumed in the look-ahead evaluations of RTC and RTD for steam turbine generators with the actual demonstrated performance
  - Address inconsistencies between the ramp assumptions used in RTD's physical pass and RTD's pricing pass when units are ramping down

Considerations for Future Work

- **Recent Work**
  - Graduated Transmission demand curve enhancements – June 2017
  - Hybrid GT pricing improvements – February 2017
  - External Total Transfer Capability Interface limits – March 2017
  - ConEd/PSEG wheel replacement - May 2017
  - Made improvements to the overnight load forecast between RTC and RTD – June 2017
- **The NYISO is currently considering the following market design enhancements that may improve convergence between RTC and RTD:**
  - Lake Success and Valley Stream PAR schedule changes
  - Constraint Specific Transmission Demand Curves
  - 100+kV Constraint Modeling
  - RTD Pricing Improvements for External Interfaces
  - Allowing flexible shutdown of DAM committed generation
  - Enhancing RTD's evaluation window
  - Treatment of resource ramping between physical and ideal dispatch
  - 5-minute Interchange Scheduling

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Next Steps/Timeline

- **Whitepaper detailing RTC-RTD convergence analysis**
  - Will be posted by December 20, 2017 under the 12/5 MIWG materials.
  - Email announcement will be made when the report is posted on the NYISO public website
- **Future Discussions**
  - Discuss findings and recommendations with stakeholders at January 16, 2018 MIWG
- **Ongoing Work**
  - Project has been prioritized for next year with a deliverable of Market design concept proposed
- **Please e-mail any questions or feedback to:** pjain@nyiso.com

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Questions?

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