



Remedial Action Schemes in the ERCOT Market

A Financial Participant's Perspective

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Appian Way Energy Partners

- Financial marketer founded in 2014. Experienced team with over 20 years of experience in LMP markets
- Active in ERCOT as well as other RTOs
 - CRRs
 - Financial futures
 - Bilateral transactions to help other market participants manage basis risk
- Appian Way principals have background in market design – we support competitive electricity markets based on open access, non-discrimination and transparency. We believe electricity market competition, with open access, leads to better public policy outcomes in electricity markets
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Overview of Comments & Discussion Topics

- Appian Way supports ERCOT's proposed NOGRR215 to limit reliability risks associated with the potential proliferation of Remedial Action Schemes (RASs)
- RASs have an important role in RTO markets, but we believe RAS usage should be rare, temporary and reserved for reliability. Concerns:
 - USE OF RAS FOR ECONOMICS INSTEAD OF RELIABILITY
 - THE SLIPPERY SLOPE PROBLEM WITH RAS PROLIFERATION
 - COMMERCIAL IMPACTS AND TRANSPARENCY



Definition and Applications

- Remedial Action Schemes are designed to detect predetermined abnormal system conditions and automatically take corrective actions. May include, but are not limited to:
 - Adjusting or Tripping Generation (MW and MVARs)
 - Tripping Load
 - System Reconfiguration
- Possible applications for RAS:
 - Reliability purposes
 - Economic purposes
 - » Congestion management
 - » Local price/dispatch management



Use of RASs for Economics vs. Reliability

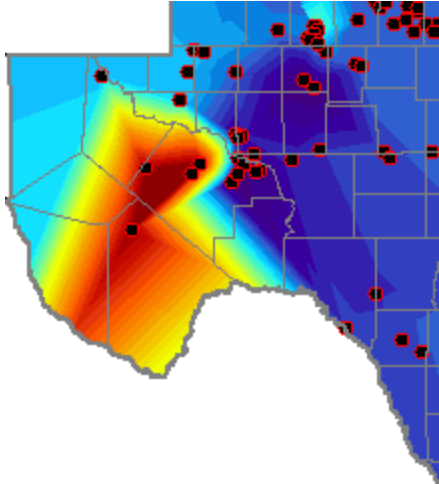
- A spot market in electricity has two principal functions:
 - **Maintain Efficient Short-Term Operations and Dispatch** – Least-cost and reliable dispatch to meet load given available resources in the hour/day; efficient usage of transmission capacity; largely independent of longer-term contract arrangements
 - **Facilitate Longer-Term Contracting and Competitive Entry** – Spot market reduces the risks of contracting; Allows contracting parties to sell “overs and unders” to meet their obligations at least cost/highest profits, facilitates entry by undiversified competitors, each of which can compete in the specific activity it does best without needing to be a self-contained, full-service producer; sends price signals regarding when and where new generation or transmission is needed
- Use of RASs for congestion management can have the unintended consequence of distorting price signals regarding long-term entry and the need for economic transmission solutions
 - By masking local congestion and flattening local prices, RAS will decrease accuracy and transparency of LMPs that may lead to wrong economic signals for future generation and transmission locations concerning congestion management
 - Using multiple RASs in a limited geographical area (to eliminate local congestion) will result in similar LMPs for the region



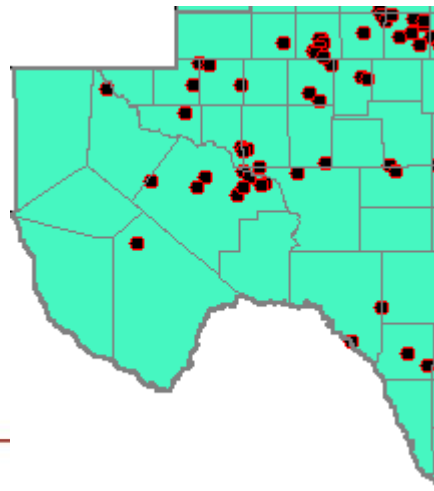
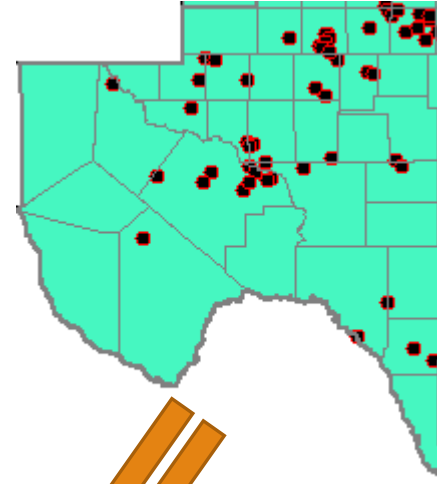
Use of RASs for Economics vs. Reliability

- Use of RAS to eliminate local congestion

Nodal Price before RAS



Nodal Price after RAS



Zonal Price



RAS Proliferation – Where does it Lead?

- If RASs become a common mechanism for addressing congestion for new entrants, more and more entrants will look to rely on RASs
- A large increase in the number of RASs could significantly and negatively impact the reliability of the ERCOT System
 - It is difficult or impossible to assess all possible impacts of RASs on the ERCOT System during the RAS approval process
 - The risk of RAS misoperation can be a significant reliability issue
 - If the number of RASs increase, especially if there are multiple RASs in a particular area, there is a heightened possibility of RAS-RAS interaction or cascading RAS operation resulting in unforeseen reliability consequences
 - As the number of RASs in the ERCOT System increase, so does the amount of maintenance needed in ERCOT systems and situational awareness tools related to RASs
 - The design of a RAS can lead to a condition where a constraint that is easily resolved by ERCOT market tools (e.g. Security-Constrained Economic Dispatch (SCED)) is replaced with post-RAS congestion that does not have a market solution



Commercial Impacts and Transparency

- When faced with multiple competing RAS proposals, how should ERCOT choose? Non-discrimination is a bedrock principle of electricity market competition. But approval of some RASs vs. others may have commercial impacts that favor one market participant over others
- Moreover, the distortion of price signals complicates the ability of financial players to offer longer-term basis hedging products and may cause project developers to adopt overly rosy expectations that mitigate the market-wide benefit of the new project
- Introduction of a new RAS can complicate CRR valuations where market participants take positions that have a certain expected value that can be eliminated by the introduction of a new RAS. This uncertainty results in higher risk premia in CRR prices
- It is important for market integrity for ERCOT to have a transparent process for handling of new RAS requests that have material market impacts

