Markets Enabling Ancillary Services From All Technologies

2nd Workshop on Active Power Control from Wind Power

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Federal Energy Regulatory Commission
The author’s views do not necessarily represent the views of the Federal Energy Regulatory Commission.
Outline

• What FERC has done
  – Order No. 890
  – Order No. 719
  – Order No. 755
  – Third-Party Provision of Ancillary Services NOPR

• Considerations for markets for ancillary services
Order No. 890: Ancillary Services

- Ancillary Service Schedules of the OATT modified to indicate they may be provided by generating units as well as non-generation resources such as demand response

Schedules:
- 2: Reactive Supply and Voltage Control
- 3: Regulation and Frequency Response
- 4: Energy Imbalance
- 5: Operating Reserve – Spinning
- 6: Operating Reserve – Supplemental
- 9: Generator Imbalance
Non-Generators Providing Ancillary Services: Examples

• Schedule 2 Reactive Supply and Voltage Control:
  – HVDC transmission terminals (Cross Sound Cable)

• Schedule 3 Regulation and Frequency Response:
  – Energy storage devices
    • electric vehicles
    • water heaters and other thermal storage
    • grid-scale batteries
    • flywheels
    • pumped storage
  – Demand response

• Schedules 4 and 5 Operating Reserve:
  – Demand response
  – Energy storage devices
Order No. 719: Wholesale Competition

- Requires RTOs to accept bids for ancillary services from technically qualified demand response resources
- Demand response participation in RTO markets in 2012:

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<th>RTO</th>
<th>Demand Bidding (MW)</th>
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<th>Spinning Reserves (MW)</th>
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Source: FERC 2012 Assessment of Demand Response and Net Metering
Order No. 755: Frequency Regulation

• Two-part market-based compensation
  – Only applies to RTO/ISO markets

• All cleared resources receive a uniform capacity price
  – Includes opportunity costs for standing ready to provide frequency regulation service

• Each resource receives a market-based performance payment for the service
  – Reflect a resource's accuracy of performance
Frequency Regulation: Pay for Performance

- Prior to Order No. 755: No differentiation in compensation for fast response.
- Today: Pay for performance in Frequency Regulation service in ISO/RTOs.

(Source: Beacon Power)
Third-Party Provision of Ancillary Services NOPR

- Regulation and frequency response reserve requirements
  - Proposes to require transmission providers to explain in their tariffs how they will determine regulation and frequency response reserve requirements, taking into account the speed and accuracy of the resources.
  - Preliminary finding that this is needed to prevent potential undue discrimination against customers that choose to meet their own needs for that ancillary service.
  - Does not mandate a method for meeting this requirement, but proposes that FERC evaluate those determinations on a case-specific basis.
Third-Party Provision of Ancillary Services NOPR

- **Market power test for ancillary service sales:**
  - Sellers that pass FERC’s current market-based rate analyses for energy and capacity would be presumed to lack market power for energy and generator imbalance services.
  - Reporting requirement that would give potential sellers of other ancillary services the information needed to develop market power analyses.
  - Proposes the use of price caps or competitive solicitations to mitigate market power.

- **Proposes revisions to FERC forms, reports, and accounting standards to account for and report transactions involving energy storage.**
Primary Frequency Response

• Currently listed under Schedule 3 of the OATT
  – (Regulation and Frequency Response Service)
  – No market yet

• New NERC Reliability Standard BAL-003 recently filed with the Commission for approval

• Questions to consider for a market:
  – What is the role of fast-responding resources?
  – What is the impact of distributed resources with smaller inertia?
Considerations for Ancillary Service Markets

- Clearly defined demand and supply
  - Non-discriminatory, technology neutral technical qualification requirements
  - How to determine demand – is it set by Reliability Standards, the market, or something else?
  - Should some minimum amount be required for reliability?
  - Are the resources providing ancillary services substitutable?
  - Should ancillary services be co-optimized or sold separately?
Considerations for Ancillary Service Markets

- Do the ancillary services cover the right set of services?
  - Interconnected Operations Services (IOS) – prior to Order No. 888 – included other services such as blackstart.
  - IOS: what transmission providers need to reliably operate the system
  - Ancillary services: what transmission providers need to offer open access to the transmission system
  - Are the ancillary services we have today the right ones for today’s markets and technologies?
Considerations for Ancillary Service Markets

• Regional differences
  – Are there physical differences that require some regions to need more fast-response resources than others?
  – Market structure: Do RTO/ISOs require different ancillary services from non-RTO/ISOs?

• Competitive: Many buyers and sellers
  – How to screen for market power?
  – How to do market power mitigation?
Considerations for Ancillary Service Markets

- **Transparency**
  - Market prices
  - Qualification process
  - Supply
  - Demand
  - Obligations of seller-rights of transmission provider – can the resource be committed for ancillary services?

- **Cost allocation**
  - Who are the buyers? Who causes the costs?
    - Transmission customers, loads, non-dispatchable generators?
  - Do payment incentives align with desired behavior to maintain reliability and economic efficiency?
Conclusion

- FERC revising rules as needed to keep up with changes in technology and market structure
- Many questions to be answered on markets for ancillary services
  - Impact of distributed resources
  - Role of innovative technologies
  - Impact of fast-responding resources