Reactive Supply Compensation in Markets Operated by RTOs and ISOs

FERC Staff Workshop

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Introduction

- ISO New England (ISO-NE) appreciates the opportunity to speak at the Reactive Supply Compensation in Markets Operated by Regional Transmission Organizations and Independent System Operators Workshop
- This presentation focuses on the key elements of the New England compensation methodology for reactive power supply and voltage control (VAR Service):
  - Elements comprising the compensation methodology
  - The types of resources eligible for compensation, and the qualification requirements
  - Adjustments to compensation based on verified capability
  - Considerations for other compensation mechanisms

Compensation for Reactive Supply and Voltage Control Service in ISO New England

- In New England, compensation for VAR Service is available under Schedule 2 of the ISO New England Open Access Transmission Tariff (ISO-NE OATT)
- Compensation methodology provides for a multi-part payment, consisting of the same four elements first implemented in 1999 through a FERC-approved settlement (88 FERC ¶ 61,140):
  - Compensation for capability (the focus of this presentation)
    1. The fixed Capacity Cost (CC): Compensation for costs *associated with* the capability to provide VAR Service; not for actual performance to provide VAR Service
  - Compensation associated with the energy market variable cost implications of certain specific circumstances of VAR Service provision*
    2. Lost Opportunity Cost (LOC): Compensation for costs incurred because of a dispatch down to provide VAR Service
    3. Cost of Energy Consumed (CEC): Compensation for costs incurred because of providing VAR Service at zero real power output
    4. Cost of Energy Produced (CEP): Compensation for costs incurred because of being brought on-line to provide VAR Service

*Resources are not required to participate in the voluntary CC program in order to receive variable costs for providing VAR Service

Elements of Schedule 2 Rate Design – CC Component

- Under the CC compensation, eligible dynamic reactive power resources, i.e. Qualified Reactive Resources (QRR), are eligible to receive monthly CC Payments
- Base CC Rate (currently, $2.19/kVAr-year)
  - A negotiated New England-wide rate for all QRRs
  - Intended to recognize fixed capacity costs related to the installation and maintenance of the equipment necessary to provide VAR Service
  - Not a “cost-of-service” commensurate to actual costs of any particular reactive resource
- Formula adjustments to the Base CC Rate account for:
  - Proration based on quantity of participating resources compared with system-wide load
  - Proration based on the amount of leading and lagging reactive capability
- Origin of the Base CC Rate
  - The $2.19/kVAr-year Base CC Rate stems from a FERC-approved settlement agreement (137 FERC ¶ 61,237)
  - The original Base CC Rate proposed in 2006, and subsequently negotiated down, was $2.32/kVAr-year and was based on a weighted average blend of the pre-existing rate for older New England generators and FERC-approved AEP methodology VAR compensation filings
  - The blend of pre- and post-market generation resulted in $2.32 or ((2/3) * $1.38) + ((1/3)*$4.20)

Types of Resources Eligible for CC Compensation

- Generator and non-generator dynamic reactive power resources that request to receive CC compensation and meet the QRR requirements are eligible for CC compensation:
  - Prior to 2006, only dynamic generator reactive resources were eligible to receive CC compensation
  - In 2006, Schedule 2 revised to include non-generator dynamic reactive resources
  - In May 2016, Schedule 2 further revised to support the participation of newer generator technologies, such as wind, solar and other inverter-based generators, in a manner that recognizes the intermittent nature of some of these technologies (ER16-1789)

CC Qualification Requirements

- All dynamic reactive resources (synchronous/asynchronous, generator/non-generator) requesting to receive CC compensation must meet the *same* QRR qualification criteria to be eligible:
  - Entity owning/controlling the resource must be a Market Participant
  - Resource must be connected to the New England Transmission System, metered and dispatchable by the ISO or otherwise subject to the ISO's operational control
  - Resource must provide *measurable dynamic reactive* power voltage support, as determined by the ISO, and have its automated voltage regulator or equivalent equipment status telemetered to the ISO
  - Resource must meet all reactive power voltage support *testing requirements*
  - Resource must be interconnected/installed pursuant to the applicable rules in the ISO-NE Tariff

CC Rate Compensation is for Actual Tested Capability to Provide VAR Service

- A QRR receives VAR CC Rate payment for the quantity of verified leading and lagging capability as physically determined by testing the resource's capability (Qualified VARs)
- Within six months of receiving QRR status and at least every five years thereafter, QRRs are required to perform tests to measure the resource's ability to provide (lagging) reactive power to and absorb (leading) reactive power from the system at the relevant associated real power outputs
  - Before testing, compensation is based on technical data, such as, manufacturer reactive capability "D-Curves"

Accounting for Reactive Power in Real Power Compensation Mechanisms

- ISO-NE Forward Capacity Market (FCM) rules explicitly require Project Sponsor to exclude from its new capacity offer any anticipated revenues the resource is expected to receive for its CC as a QRR under Schedule 2
  - Protects against double compensation of costs
- This approach recognizes that:
  - Not all resources participating in the FCM are VAR-capable
    - Including compensation for VAR Service in FCM could result in non-VAR capable resource receiving a payment for VAR Service, or not compensating VAR-capable resources for the capability
  - Similar resources from an FCM perspective may have different levels of VAR capability
    - Compensated accordingly under Schedule 2

Questions