Disclaimer for Customer Training: ISO New England (ISO) provides training to enhance participant and stakeholder understanding. Not all issues and requirements are addressed by the training. Consult the effective Transmission, Markets and Services Tariff and the relevant Market Manuals, Operating Procedures and Planning Procedures for detailed information. In case of a discrepancy between training provided by ISO and the Tariff or Procedures, the meaning of the Tariff and Procedures shall govern.

Settlements Forum

2018 Q4

Rachel Likover, Sarthak Pant, and Sabely Peralta
Market Analysis & Settlements

Note: This presentation was updated on 12/13/2018. Q&A from the live session was added at the end.
Topics

Upcoming Market/Settlement Changes

- Energy Storage Devices
- Forward Capacity Market – Capacity Supply Obligation (CSO) Cover Changes
- Forward Reserve Market – Internal Bilateral Transaction Submittal Deadline

Informational Items

- Forward Capacity Market – Competitive Auctions with Sponsored Policy Resources (CASPR)
- Forward Capacity Market – Annual Reconfiguration Transactions (ARTs)
- Website Tour
- Meeting Dates
Upcoming Market/Settlement Changes

- Energy Storage Devices
- Forward Capacity Market (FCM) – CSO Cover Changes
- Forward Reserve Market – Clarification on IBT deadlines
Energy Storage Devices (ESD)

April 1, 2019 *

Joint ISO-NE/NEPOOL Filing

• Enhance the ability of grid size storage to participate in markets
  – Binary Storage Facility (pumped storage)
  – Continuous Storage Facility (e.g. batteries)
• MIS report changes
  – Energy
  – Net Commitment Period Compensation (NCPC)
  – Regulation

Joint ISO-NE/NEPOOL FERC Filing

ER19-84-000

Link to FERC filings in .pdf version.

See this project’s web page:
• Customer Readiness page

* Pending FERC approval
What Are ESD?

ESD store electricity from the grid for later injection back into the grid

Two types of ESD:

• Binary storage facility (pumped storage)
  – Two assets: generator and dispatchable asset related demand (DARD)
  – Need time to switch between operation modes

• Continuous storage facility (e.g. batteries)
  – Three assets: generator, DARD, alternative technology regulation resource (ATRR)
  – Can move between max output & max consumption in 10 minutes or less
  – Simultaneous dispatch of facility; signal sent at 4 second intervals
FCM Capacity Supply Obligation (CSO) Cover Changes
Effective for FCM Settlements starting June 2019*

Joint ISO-NE/NEPOOL Filing

• New rules for resources with CSO that don’t fully satisfy obligation
  – Obligation satisfied by demonstrating MW output

• Monthly calculation of difference between resource CSO and its historical Maximum Demonstrated Output (MDO)
  – If CSO > MDO, failure to cover charge assessed for CSO MW above MDO
  – Tariff failure to cover rate **

• Participants cover unsatisfied resource obligation by transferring the obligation via reconfiguration auctions or bilateral transactions

• Failure to cover charges allocated as credits to Capacity Load Obligation

• MIS report changes
  – February 2019: New annual report, prefix “SP”, prior to ARA-3***
  – June 2019: New monthly detail report, some updates to current reports

*Pending FERC approval  ** Rate for June 2019-May 2022: Max Clearing Price (FCA, Reconfiguration Auctions) *** ARA: Annual Reconfiguration Auction

Joint ISO-NE/NEPOOL FERC Filing

ER19-169-000

Link to FERC filings in .pdf version.

See this project’s description:
• Customer Readiness page
Forward Reserve Market Internal Bilateral Transactions (IBT)

Submittal Deadlines

FRM Internal Bilateral Transaction (IBT) is contract for the transfer of FRM obligation

• At market inception, FRM IBT submittal deadline was prior to operating day
• In 2015, submittal deadline changed
  – Second business day after operating day
  – Same deadline as Real-Time Energy Market IBTs
• Option for submitting FRM IBT for market resettlement was silent

Clarification is provided here:

• FRM IBT submittal for the Data Reconciliation Process (DRP) resettlement
  – Deadline is 101 business days after end of operating month
  – Same deadline as Real-Time Energy Market IBTs
  – DRP IBT deadlines for each year included here

The IBT User Guide on the ISO New England website reflects this clarification
Informational Items

- Informational: Forward Capacity Market – CASPR
- Informational: Forward Capacity Market – ARTS
- Website Tour
- Settlements Forum Dates
- Questions
FCM Competitive Auctions with Sponsored Policy Resources (CASPR)
February, 2019 – FCA #13 for 2022/23

Joint ISO-NE/NEPOOL Filing

• Secondary auction in the Forward Capacity Auction (FCA) process
• Market entry for resources receiving revenue from state or municipal government
  – New clean, renewable, or alternative energy
• These resources may be unable to sell capacity in the FCA
  – Out-of-market revenues prohibited from lowering FCA offer
• Substitution auction matches, MW for MW, the entry of these sponsored resources with retirement of existing resources
• Settlement impact/MIS revisions: Not until 2022/23!

Joint ISO-NE/NEPOOL FERC Filing

ER18-619-000

Link to FERC filings in .pdf version.

See this project’s web page:
• Customer Readiness page
FMC Annual Reconfiguration Transactions (ARTS)
Apply to Capacity Commitment Periods (CCP) starting in 2020/21

Joint ISO-NE/NEPOOL Filing
• ARTS will provide participants and their counterparties a method to acquire or shed CSO with price certainty
• ARTS replace CSO bilaterals for CCP 2020/21 and forward
• ARTS will be submitted during the annual reconfiguration auctions (ARA)
• First ARAs with ARTS functionality
  – June 3, 2019: ARA #1 for 2021/22
  – Aug 1, 2019: ARA #2 for 2020/21
• Settlement impact/MIS revisions: Not until 2020/21!
Past Website Tours

Today’s Website Tour
• Customer Readiness 12-month outlook

Website Tours from Past Settlement Forums
2018 Q3 – ISO to Go 2.0; Billing Process Summary
2017 Q1 – How to subscribe to the Settlement Forum
2016 Q4 – Metering & Resettlements Calendar
2016 Q3 – Enhanced LMP Selection Options
2016 Q2 – Understanding The Bill page

Visit the Settlement Forum materials page to view these tours.

See the Appendix for more information
Settlements Forum Dates 2018

- **Q1** Thursday, March 8 at 10:00 AM
- **Q2** Thursday, June 7 at 10:00 AM
- **Q3** Thursday, September 6 at 10:00 AM
- **Q4** Thursday, December 6 at 10:00 AM
2019 Settlement Forum Dates

Q1  Thursday, March 7 at 10AM

Q2  Thursday, June 6 at 10AM

Q3  Thursday, September 5 at 10AM

Q4  Thursday, December 5 at 10AM
Appendix: Website Tour
Today’s Website Tour – Customer Readiness 12-Month Outlook

Helpful for answering many billing questions!

1. Open the ISO website
2. Navigate to: Participate > Support > Customer Readiness 12-Month Outlook
   - Scroll down to the project of interest;
   - Click the project’s title to go to the project page

Near-Term Projects

(0-6 Months)

<table>
<thead>
<tr>
<th>PROJECT</th>
<th>TARGET LAUNCH</th>
</tr>
</thead>
<tbody>
<tr>
<td>Competitive Auctions with Sponsored Policy Resources (CASPR)</td>
<td>February 4, 2019</td>
</tr>
</tbody>
</table>

Longer-Term Projects

(7-12 Months)

<table>
<thead>
<tr>
<th>PROJECT</th>
<th>TARGET LAUNCH</th>
</tr>
</thead>
<tbody>
<tr>
<td>Balance of Planning Period: Financial Assurance (BOPP FA)</td>
<td></td>
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</tbody>
</table>

Click to subscribe
1. For energy storage devices (ESD), can you explain how the generator, dispatchable asset related demand (DARD), and alternative technology regulation resource (ATRR) are dispatched simultaneously?

The ESD is one physical facility; for example, it could be a bank of large batteries. One dispatch signal is sent to the ESD facility. The signal, which is sent at a four second granularity, may be tell the ESD to inject energy to the grid or to consume energy.

In the ISO’s model, the ESD is represented as three assets: a generator, a DARD, and an ATRR. When the ESD is injecting energy onto the grid, the activity is recorded for the generator asset. When the ESD is consuming energy, the activity is recorded for the DARD asset. If the ESD is providing regulation, then the movement in the 4 second dispatch instructions will be recorded for the ATRR. (If the ESD is not providing regulation, the signal will be sent at four second intervals but the instruction will only be subject to change at 5 minute intervals.) Since only one signal is sent to the facility, it is a simultaneous dispatch of the three assets, where the signal directs the ESD to either provide energy, consume energy, and whether these activities are directed rapidly enough to provide regulation.

2. Can you repeat how far back you look for Maximum Demonstrated Output (MDO) in the CSO Cover calculation? And do you use the highest/lowest/average of this period?

The look back for the MDO starts 6 years from the beginning of the Capacity Commitment Period (CCP); one month will be added to the end of the period as we progress through the CCP. For example:

- In June 2019, the look back period will be June 2013-June 2019.
- In July 2019, the look back period will be June 2013-July 2019.
- In May 2020, the look back period will be June 2013-May 2020

We use the highest energy quantity in any interval during the look back period.

3. In the CSO Cover calculation, will the Failure to cover rate be applied to self supply resources?

Yes. All resources, including self supply, will be evaluated for failure to cover. Any failure would be charged at the failure to cover rate, as described in slide 6 of the presentation.