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December 7, 2017

WebEx Broadcast

Settlements Forum

2017 Q4

Rachel Likover

Market Analysis & Settlements



Version 1: Added Q&A list from the live webinar (pages 25-26)

Topics



Upcoming Settlement/Market Changes

- Winter Reliability Program
- Forward Capacity Market- Performance Incentives
- Price Responsive Demand
- Net Commitment Period Compensation - Cost Reallocation



Informational Items

- New! Forward Capacity Market Cost Allocation Projection Report
- Website Tour
- Next meeting date

Upcoming Settlement/Market Changes

- Winter Reliability Program
- Forward Capacity Market – Performance Incentives
- Price Responsive Demand – Full Integration
- NCPD Cost Reallocation



Winter Reliability Program

December 2017 – February 2018



Joint ISO-NE/NEPOOL FERC Filing

- Objective is to maintain reliability during the cold weather months
- Filing contains two proposals; ISO and NEPOOL
- FERC order selected NEPOOL proposal
- This winter, 2017/18, is the last period when this program will be in effect
 - Program ends with Forward Capacity Market - Performance Incentives implementation in June 2018

**Joint ISO-NE/NEPOOL FERC Filing
Winter Reliability Program**

[ER15-2208-000](#)

[FERC Order - ER15-2208-000](#)

Winter Reliability Program

Program Details and Rates



- Offset carrying cost of unused firm fuel purchased by generators for winter period
 - Compensation for unused oil inventory
 - Compensation for unused LNG contract volume
- Demand Response program

Set Rates for 2017/18 Payments Market Rule 1, Appendix K Calculation Posting *

Oil: \$10.33/BBL

LNG: \$1.72/MMBTU

DR: \$1.033/kW-month

* [Visit the Winter Program Payment Rate webpage for further details.](#)

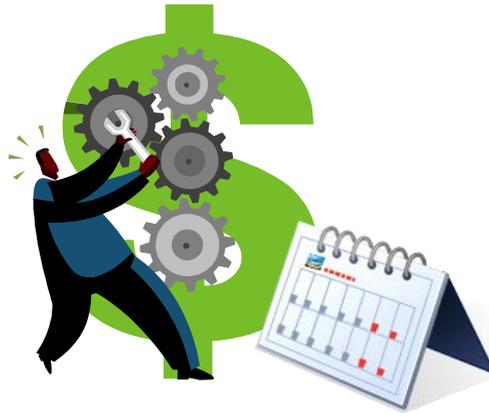


Winter Reliability Program

Updated Settlement and Billing Process Details



- Program charges for three months (December – February)
- Charges allocated pro-rata on Real Time Load Obligation (RTLO)*
- Estimated charges billed out monthly for three months, and then a true-up reflecting final actual unused inventories will be calculated and billed



** Excluding RTLO associated with Dispatchable Asset Related Demand pumping load and Coordinated External Transactions (CETs).*

Winter Reliability Program

Updated Settlement and Billing Process Details



Charge estimates based on 75% of eligible inventory on Dec 1st

Approximate Eligible Inventory Charge *	
Oil:	\$29 Million
Gas:	None
DR:	\$23 Thousand
Total	\$29 Million

75% of Total Inventory: ~\$21.8 Million

Charge Estimates* for December – February:
~ \$7.3 Million per Month

Payment to generators for unused fuel inventory will take place in one bill, issued on May 14, 2018

* Subject to change based on actual December inventory.

Winter Reliability Program

Program Settlement Calendar



CHARGES BILLING TIMELINE - OFFSET FOR UNUSED FUEL

Program Month	Program Charge Estimate Billing Month	Program Final Charge True-Up Billing Month
Dec 2017	Jan 2018	Apr 2018
Jan 2018	Feb 2018	Apr 2018
Feb 2018	Mar 2018	Apr 2018

CREDITS BILLING TIMELINE - OFFSET FOR UNUSED FUEL

Program Month	Program Credits Billing Month
Dec 2017	May 2018
Jan 2018	May 2018
Feb 2018	May 2018

CHARGES AND CREDITS BILLING TIMELINE - DEMAND RESPONSE

Program Month	Program Charges Billing Month	Program Credits Billing Month
Dec 2017	Jan 2018	Feb 2018
Jan 2018	Feb 2018	Mar 2018
Feb 2018	Mar 2018	Apr 2018

Winter Reliability Program

Settlement and Billing Reference Guide



MIS File Name	MIS Report Name	Invoice Line Item
SS_WRGENUIMC	Winter Reliability - Gen Unused Inventory Monthly Charges	Winter Gen Unused Inv Chrg
SS_WRGENUIP	Winter Reliability - Gen Unused Inventory Payment	Winter Gen Unused Inv Pymt
SS_WRDRMP	Winter Reliability - DR Monthly Payments	Winter DR Monthly Pymt
SS_WRDRMC	Winter Reliability - DR Monthly Charges	Winter DR Monthly Chrg
SS_WRDREP	Winter Reliability - DR Energy Payments	Winter DR Energy Pymt
SS_WRDREC	Winter Reliability - DR Energy Charges	Winter DR Energy Chrg
SS_WRGENFMOC	<i>Winter Reliability - Commissioning Failure to Meet Obligation Charges</i>	<i>Winter Comm Obl Failure Chrg</i>
SS_WRGENFMOR	<i>Winter Reliability - Commissioning Failure to Meet Obligation Refund</i>	<i>Winter Comm Obl Failure Refund</i>

- *Invoice Line Items will be detailed in the monthly bill Bill Job Aids (Dec – May)*
- *Participants receive MIS reports as applicable, e.g.:*
 - *Gen Unused Inventory Monthly Charges issued to Participants with RTLO during the month*
 - *Gen Payments report will be issued to program Participants with unused inventory*

Indicates MIS Report related to Dual Fuel Commissioning; Issuance triggered by exception case.

Forward Capacity Market – Performance Incentives

June 1, 2018*



Joint ISO-NE/NEPOOL Filing

- Implement pay for performance design
 - Resources will get a **capacity performance score** during scarcity conditions (could be positive or negative)
 - Payments/charges are based on this score and the tariff rate
 - Includes stop loss provisions
 - Includes revisions to Settlement MIS reports
- Retire current performance provisions
 - Shortage events
 - Demand response
 - External transaction penalties

Joint ISO-NE/NEPOOL FERC Filing

[ER14-1050-000](#)

[ER14-1050-001](#)

[ER14-2419-001](#)



Upcoming training will be announced soon!

[See the Key Project web page.](#)

* Pending FERC approval of conforming changes

Capacity Scarcity Event Scenario

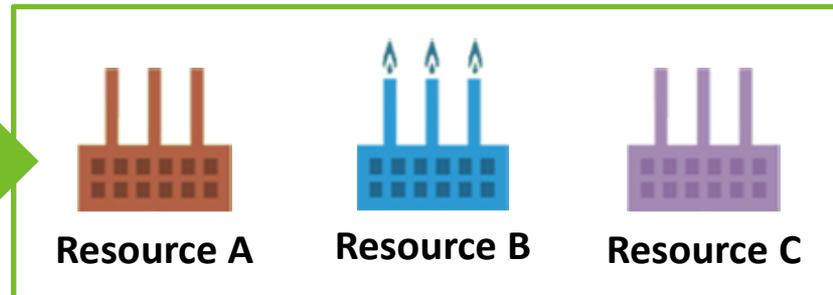
Scenario details:

- The total pool Capacity Supply Obligation (CSO) is 30,000 MW
- In this interval, we need 27,000 MW to cover load and operating reserve
- We have a capacity **scarcity** condition lasting 5 minutes
 - Reserve Constraint Penalty Factor included in 5-minute LMP

Steps to find a resource's payment/charge

1. Calculate the balancing ratio
2. Determine each resource's actual capacity provided
3. Calculate each resource's capacity performance score
4. Calculate each resource's payment or charge

What will these resources get paid/charged?



Step 1: Calculate the Balancing Ratio

Scenario details:

- Total CSO: 30,000 MW
- 5 min long capacity scarcity condition
- Total capacity needed to cover load and reserve: 27,000

The ISO uses the balancing ratio to determine the amount of capacity that was needed from each resource during the scarcity condition.

Capacity needed for reliable system operation



$$\text{Balancing Ratio} = \frac{\text{Load + Reserve Requirement}}{\sum \text{Capacity Supply Obligation}}$$

$$\text{Balancing Ratio} = \frac{27,000 \text{ MW}}{30,000 \text{ MW}} = 0.9$$

Step 2: Determine Resource's Actual Capacity Provided

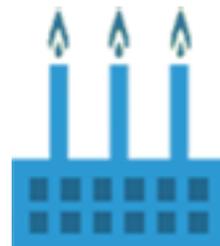
Scenario details:

- Capacity required: 27,000 MW
- Total pool CSO: 30,000 MW

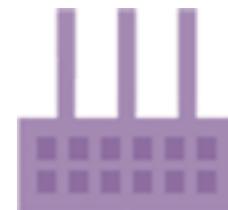
- **Balancing ratio: .9**



Resource A



Resource B



Resource C

Energy Quantity	10 MW	45 MW	46 MW
Reserve Designation	0 MW	10 MW	4 MW
Actual capacity provided (ACP)	10 MW	55 MW	50 MW

$$\text{Actual Capacity Provided (ACP)}^* = \text{Energy Quantity} + \text{Reserve Designation}$$

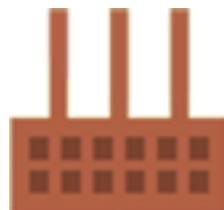
* The calculation for ACP varies by resource type. See the [appendix](#) for details.

Step 3: Get Each Resource's Capacity Performance Score

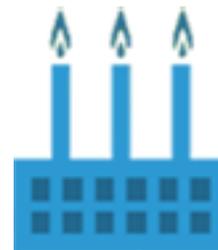
Scenario details:

- Capacity required: 27,000 MW
- Total pool CSO: 30,000 MW

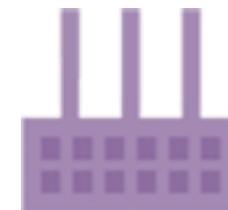
- **Balancing ratio: .9**



Resource A



Resource B



Resource C

Energy Quantity	10 MW	45 MW	46 MW
Reserve Designation	0 MW	10 MW	4 MW
Actual capacity provided (ACP)	10 MW	55 MW	50 MW
Capacity supply obligation (CSO)	100 MW	50 MW	0 MW
CSO x Balancing Ratio	90 MW	45 MW	0 MW
Performance Score	-80 MW	10 MW	50 MW

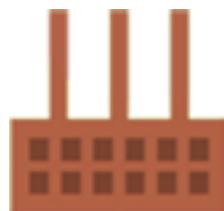
$$\text{Performance Score} = \text{ACP} - (\text{Balancing Ratio} \times \text{CSO})$$

Step 4: Calculate the Resource's Payment/Charge

Scenario details:

- Capacity required: 27,000 MW
- Total pool CSO: 30,000 MW

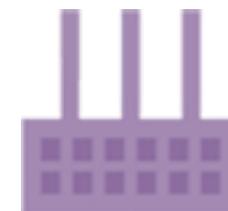
- Balancing ratio: .9



Resource A



Resource B



Resource C

Energy Quantity	10 MW	45 MW	46 MW
Reserve Designation	0 MW	10 MW	4 MW
Actual capacity provided (ACP)	10 MW	55 MW	50 MW
Capacity supply obligation (CSO)	100 MW	50 MW	0 MW
CSO x Balancing Ratio	90 MW	45 MW	0 MW
Performance Score	-80 MW	10 MW	50 MW
Payment/(Charge)	-13,333.33	1,166.67	8,333.33

$$\text{Payment/Charge} = \text{Performance Score} \times (\text{Tariff rate}^*/12)$$

* Tariff Rate: \$2000/MWh for first 3 years

Fully Integrated Price Responsive Demand (PRD)

June 1, 2018*



Joint ISO-NE/NEPOOL Filing

- Full integration of active demand response into the energy and reserves markets
 - ‘Must offer’ requirements for assets mapped to resource with Capacity Supply Obligation
- Demand reduction offers incur ISO Tariff Schedule 2 expenses
- Settlement MIS Report revisions
 - DA & RT Energy and Reserves
 - Additional new reports for DA & RT NCPC

Joint ISO-NE/NEPOOL FERC Filing

[ER11-4336-000](#)
[ER15-257-000](#)
[ER16-167-000](#)
[ER17-2164-000](#)*



- Watch the [DRWG web page](#) for PRD information

[See the Key Project web page;](#)
[includes training session link](#)

* Pending FERC approval of conforming changes

Fully Integrated PRD; NCPC Cost Reallocation

June 1, 2018



Joint ISO-NE/NEPOOL Filing

- Compliance with FERC Order 719, included in PRD implementation
- Real-time NCPC cost allocation during scarcity events
- Load deviations that are reductions from day-ahead commitments will be relieved of NCPC uplift charges
 - These charges reallocated to all Real Time Load Obligation
- Settlement MIS Report revisions

Joint ISO-NE/NEPOOL FERC Filing

[ER17-2164-000*](#)



- *See filing letter, pages 38-40 (Section G.2 of the letter). FERC approval is pending.*

Informational Items

- New FCM Cost Allocation Report
- Sorting and searching iso-ne.com
- Settlements Forum Dates
- Questions & Discussion



Forward Capacity Market

Net Regional Clearing Price (NRCP) Forecast – New Report on Website



- Informational report with projections of monthly NRCP by capacity zone
 - 2018/19
 - 2019/20
 - 2020/21
- Reports updated after each Annual Reconfiguration Auction (ARA)
- Objective is to assist participants in projecting FCM cost allocation
 - Estimates only
 - Will not match actual rates used in ISO settlement

NRCP Forecast Report

[NRCP Reporting](#)
[NRCP Report Tutorial Video](#)



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October 11, 2017

Net Regional Clearing Price Forecast

New Report



Net Regional Clearing Price Forecast Report

← ISO New England Training | 123 plays



FCA Delist Process Overview

← ISO New England Training | 61 plays

Settlements Forum Dates 2017



Thursday, March 2 at 10:00 AM



Thursday, June 8 at 10:00 AM



Thursday, September 7 at 10:00 AM



Thursday, December 7 at 10:00 AM

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

APPENDIX

- FCM Actual Capacity Provided (ACP) determination by Resource Type



Actual Capacity Provided (ACP) – Calculations

- Generating Resource
 - = **Energy Quantity + RT Reserve Designations – External Transaction sales**
- Import Resources
 - = **Max(0, Net Energy Delivered)**
- Active demand capacity resources (ADCR)
 - = **Max (0, ((RT Demand Reduction * T&D Loss Factor) + Net Supply + Reserve Designation))**
 - This calculation also applies to demand response resources that are not associated with an FCM capacity resource
- Passive demand capacity resource by configuration type:
 - Energy efficiency and load management
 - = **Max (0, (RT Load Reduction * T&D Loss Factor)**
 - Energy efficiency resources only evaluated in peak hours
 - Distributed generation
 - = **Max (0, ((RT Demand Reduction * T&D Loss Factor) + Net Supply))**

Settlements Forum: Thursday, December 7, 2017

Questions and Answers from the Webinar

1. **Question:** What will replace the Winter Reliability Program?

Answer: The Forward Capacity Market Performance Incentives – Pay for Performance (PfP) design will eliminate the need for the Winter Reliability Program. Under PfP, generators will be incentivized to maintain a firm fuel supply during cold weather.

2. **Question:** If there is an imbalance in the PfP credit and charge process, how will the over- or under-collection be allocated out?

Answer: It will be allocated pro-rata to Capacity Supply Obligation (CSO).

3. **Question:** What are the rates in the Tariff for capacity performance payments?

Answer: For the first 3 years, the rate is \$2000/MWh (2018/19 through 2020/21)

a. For the next 3 years, the rate is \$3500/MWh (2021/22 through 2023/24)

b. For subsequent years, the rate is \$5455/MWh

4. **Question:** How is an FCM resource protected from the risk of "unlimited" charges? What is that amount or calculation?

Answer: Under PfP, a resource that performs worse than its share of the system requirement during scarcity conditions has a negative Capacity Performance Score. This results in a negative Capacity Performance Payment for the resource. PfP includes monthly and annual stop-loss mechanisms which limit the magnitude of the resource's negative performance payment. The monthly stop-loss limit and the annual stop-loss limit are applied separately.

A resource that has reached either the monthly stop-loss limit, or the annual stop-loss limit, will have its negative performance payment limited in an obligation month.

A resource's monthly stop-loss limit is equal to the product of its CSO MW and the applicable Forward Capacity Auction (FCA) Starting Price.

Conceptually, a resource's annual stop-loss limit is equal to three times its maximum monthly net loss, where its maximum monthly net loss is its monthly FCM payment minus the monthly stop-loss limit. (The FCM payment is the payment for the CSO MW at the Forward Capacity Auction clearing price, and/or applicable reconfiguration auction or bilateral prices.) The details of these calculations are in Section III.13.7.3 of the [revised tariff](#).

5. **Question:** Does the stop-loss mechanism apply to demand resources?

Answer: Yes, the stop-loss mechanism applies to all FCM capacity resources.

6. **Question:** How will a scarcity condition be communicated?

Answer: Scarcity conditions are determined after the LMP has been finalized. Participants can monitor the Reserve Market Clearing Prices (RMCP) to determine if a Reserve Constraint Penalty Factor (RCPF) is setting price, as this may indicate a scarcity condition. There are three reserve shortage scenarios when RCPF is setting the RMCP that can indicate scarcity conditions:

- Local Thirty Minute Operating Reserve (TMOR) (RCPF=\$250/MWh)
- System-wide TMOR (RCPF = \$1000/MWh)
- System-wide Ten Minute Non-Spinning Reserve (RCPF=\$1500)

7. **Question:** Will the Price Responsive Demand (PRD) program only impact load, and not generators, on a Settlement basis?
Answer: The costs of PRD are allocated to load only, so on a strictly settlement basis, the answer is yes. Note that since PRD will impact the clearing price calculations, generators will be impacted by the inclusion of PRD in the energy and reserve markets.
8. **Question:** Would you please provide thoughts on what value is the most appropriate for load to calculate its monthly capacity charges from the Net Regional Clearing Price report?
Answer: The estimates of the total effective charge rates to load are provided in the final table of the report. Remember that these are projections only, and will not match the actual billed rates.
9. **Question:** Related to FCM, when will the Peak Energy Rent (PER) determination end?
Answer: PER will no longer be included in FCM settlement calculations starting in 2019/20.
10. **Question:** Under PfP, if a demand resource is offered at the ceiling price of \$1000/MWh, and never clears Day ahead or is dispatched in real time, would the demand reduction offer be counted as an energy delivery for the Actual Capacity Provided (ACP) calculation?
Answer: The demand resource's available reserve would be considered ACP; there is no energy delivery in this example.