External Transactions

Credit Requirement

Waseem Alkhatib

Product Business Senior Analyst

New York Independent System Operator

Credit Policy Working Group

August 13, 2012

Rensselaer, NY

DRAFT – FOR DISCUSSION PURPOSES ONLY

Agenda

- Background
- External Transactions Credit Requirements
- Next Steps

Background

- In 2009 an evaluation of External Transactions Credit Requirements was performed and NYISO brought proposed changes through the governance process.
  - *Changes received Board of Director approval in August 2009.*
  - *Implementation was originally planned for 2010 but delayed to 2012 due to system and resource constraints; it then shifted again due to FERC Order 755.*
- The project to automate the proposed changes is planned for deployment in June 2013.

External Suppliers (Import Transactions)

External Suppliers

- Import Suppliers that offer supply in the Day-Ahead Market incur the obligation to cover their Day-Ahead position by scheduling and delivering energy in Real-Time or by financially settling their position at Real-Time prices.

External Suppliers

- For most Market Participants, imports scheduled in the Day-Ahead Market are scheduled to flow in the Real-Time Market.
- These Market Participants rarely incur losses.
- Typically, the payments due to the importer for power that does flow more than offset occasional losses.

External Suppliers

- There are some Market Participants whose Day-Ahead Market import transactions rarely, if ever, flow.
  - *These import transactions are essentially the same as virtual supply bids.*

- Currently these Market Participants may not have sufficient credit coverage for potential losses incurred on these essentially virtual positions.

External Suppliers (Import Transactions)

Bidding Credit Requirements

External Suppliers – Bidding Requirements

- Using a historical performance approach, the NYISO can track the delivery performance of each external supplier over time.

- This information can be used in conjunction with the Virtual Supply Price Differential to determine credit requirements for Market Participants that appear to be using external transactions to engage in virtual transactions.

External Suppliers – Bidding Requirements

- The historical performance approach will apply to external suppliers with sufficient bidding history:
  - *Sufficient bidding history is defined as 50 bids in prior 3 or 6 month window.*
  - *If 25% or more of the MWhs analyzed settled at loss the external supplier will be subject to external transaction credit requirements.*
  - *Historical performance analysis will be completed on a monthly basis.*
- An external supplier without sufficient bidding history will always be subject to these credit requirements, including new external suppliers.

External Suppliers – Bidding Requirements

- The Virtual Supply Price Differential for external transactions will be calculated for all of the external proxy busses using the same time period groupings and thresholds as currently used for Virtual Transactions.
  - *Price differential data will be segmented into the following three groups (seasons):*

Season	Time Duration	
	Duration Start	Duration End
Summer	May 1 (00:00:00)	August 31 (23:59:59)
Winter	December 1: (00:00:00)	February 28 (23:59:59) February 29 (23:59:59) during leap years
Rest of Year	September 1 (00:00:00) March 1 (00:00:00)	November 30 (23:59:59) April 30 (23:59:59)

External Suppliers – Bidding Requirements

- The bidding requirement for external suppliers subject to this credit requirement in the NYISO market will be:
  - *Bid MWhs multiplied by the appropriate Virtual Supply Price Differential.*

Example:

Bid Curve	I	II	III
MWhs	27	61	100
Bid $/MWh	46	55	58

- Maximum Bid Energy MWhs amount = 100
- Virtual Supply Price Differential = $60
- ***Credit Requirement = 100 * $60 = $6,000***

External Suppliers (Import Transactions)

Operating Credit Requirements

External Suppliers – Operating Requirements

- Once the Day-Ahead Market's schedules and prices have been established after the DAM posts, the credit requirement for accepted Day-Ahead transactions will be:
  - *Scheduled MWhs in the Day-Ahead market multiplied by the appropriate Virtual Supply Price Differential.*

Example:

- Scheduled MWhs in the DAM = 50
- Virtual Supply Price Differential = $60
- ***Credit Requirement = 50 * $60 = $3,000***

External Suppliers – Operating Requirements

- Once the Real-Time Market's schedules and prices have been established after the completion of the energy hour indicated by the bid's date/time, the credit requirement will be:
  - *Absolute value of DAM Settlement minus the Balancing Payment*
    - Dam Settlement = DAM Scheduled MWhs * DAM LBMP
    - Balancing Payment = Max ((DAM Scheduled MWhs – Actual MWhs) * RT LBMP),0)

External Suppliers – Operating Requirements (cont.)

Example:

- DAM Scheduled MWhs = 50
- Actual MWhs = 10
- DAM LBMP = $40
- RT LBMP = $60

** Credit Requirement = |(50*$40) – Max((50-10)*$60),0)| = $400*

DAM Settlement

Balancing Payment

Holding Requirement

External Suppliers (Import Transactions)

Actual Purchases/Sales

External Suppliers – Actual Purchases/Sales

- After the market day is complete, the credit requirement will equal the payments due to the NYISO as determined by the Daily Bill results for that market day.

External Buyers (Export Transactions)

External Buyers

- Market Participants that bid to purchase energy in the Day-Ahead Market need to have sufficient credit to cover the value of the price capped export bid.

- Day-Ahead export buyers are essentially the same as virtual demand if the transaction does not flow in Real-Time.
  - *The buyer will have to sell the power back in the NYISO Real-Time Market.*

External Buyers

- The Virtual Load Price Differential will be calculated for all of the external proxy busses using the same time period groupings and thresholds as currently used for Virtual Transactions.

- The Virtual Load Price Differential will be used in calculating the credit requirement for External Buyers.

External Buyers (Export Transactions)

Bidding Credit Requirements

External Buyers– Bidding Requirements

- Grouping of Bids:
  - *All bids for each Market Participant that have the same Transaction Source, Sink and Bid Date/Hour will be grouped together and evaluated as one for the purpose of calculating bidding requirements.*
  - *Day-Ahead bids and Hour-Ahead bids will be grouped separately.*

External Buyers–
Bidding Requirements

- The bidding requirement for each bid group for each external buyer in the NYISO Day-Ahead market will be:

  The higher of:

  - *Maximum potential exposure for each bid group based on the bid prices.*

  or

  - *Maximum potential exposure based on the Virtual Load Price Differential*
    - The sum of all MWhs in the bid group multiplied by the Virtual Load Price Differential.

External Buyers–
Bidding Requirements

Example:

A) Maximum Exposure based on Bid Price = $ 4,500

Bid Curve A	I	II
MWhs	100	90
Bid $/MWH	10	15

Bid Curve B	I	II
MWhs	80	70
Bid $/MWH	30	45

If price is	Scheduled MWhs	Potential Exposure
≤ $ 10	100 + 90 + 80 + 70= 340	340 * $10 = $3,400
$10.01 to $15	90 + 80 + 70 = 240	240 * $15 = $3,600
$15.01 to $30	80 + 70 = 150	150 * $30 = $4,500
$30.01 to $45	70	70 * $45 = $3,150
≥ 45.01	0	N/A

B) Maximum Exposure based on Virtual Load Price Differential

Assume Virtual Load Price Differential = $12

*Maximum exposure = 340 * $12 = **$4,080***

- ***Credit Bidding Requirements = higher of A or B = $4,500***

External Buyers–
Bidding Requirements

- The credit requirement for each bid group for each external buyer bidding in the NYISO Hour-Ahead market will be:
  - *Maximum potential exposure for each bid group based on the bid prices.*

External Buyers (Export Transactions)

Operating Credit Requirements

External Buyers–
Operating Requirements

- Once the Day-Ahead Market's schedules and prices have been established after the DAM posts, the credit requirement for accepted Day-Ahead transactions will be:
  - *Scheduled MWhs in the Day-Ahead Market multiplied by the higher of LBMP or appropriate Virtual Load Price Differential*

Example:

- DAM Scheduled MWhs = 100
- DAM LBMP = $50
- Virtual Load Price Differential = $40
- ***Credit Requirement = 100 * $50 = $5,000***

- The calculation of the credit requirement for Hour-Ahead bids will remain the same.

External Buyers– Operating Requirements

- Once the Real-Time Market's schedules and prices have been established after the completion of the energy hour indicated by the bid's date/time, the credit requirement will be:
  - *Day-Ahead (DA) calculation:*
    - The holding requirement will be reduced by the Balancing Payment.
    - Balancing Payment = Max ((DAM Scheduled MWhs –Actual MWhs) * RT LBMP),0)
  - *Hour-Ahead (HA) calculation:*
    - Max((Actual MWhs - DAM Scheduled MWhs) * RT LBMP), 0)
  - *Transaction Operating Requirement = DA calc + HA calc*

External Buyers–

Operating Requirements

Example 1:

- DAM Scheduled MWhs = 100
- Actual MWhs = 90
- RT LBMP = $40
- DAM Post Holding Requirement (from slide 28) = $5,000

DAM Post Holding **Balancing Payment**

- *Day-Ahead requirement = $5,000 - Max((100 - 90) * $40,0)*
  = $5,000 - $400
  = $4,600

- *Hour-Ahead requirement = Max((90 - 100) * 40),0)*
  = $0

- ***Transaction Operating Requirement = 4,600 + 0 = $4,600***

External Buyers–

Operating Requirements

Example 2:

- DAM Scheduled MWhs = 100
- Actual MWhs = 120
- RT LBMP = $40
- DAM Post Holding Requirement (from slide 28) = $5,000

DAM Post Holding **Balancing Payment**

- *Day-Ahead requirement = $5,000 - Max((100 - 120) * $40,0)*
  = 5,000 - $0
  = $5,000

- *Hour-Ahead requirement = Max((120 - 100) * $40),0)*
  = $800

- ***Transaction Operating Requirement = 5,000 + 800 = $5,800***

External Buyers (Export Transactions)

Actual Purchases/Sales

External Buyers – Actual Purchases/Sales

- After the market day is complete, the credit requirement will equal the payments due to the NYISO as determined by the Daily Bill results for that market day.

Wheel Through Transactions

Wheel Through

- Market Participants that bid to move energy though the NYISO need to have sufficient credit to cover the value of the price capped congestion bid.

Wheel Through Transactions

Bidding Credit Requirements

Wheel Through – Bidding Requirements

- The bidding requirement for each Wheel-Through bid in the NYISO market will be:
  - *The maximum potential exposure in the DAM and HAM for each bid submitted.*

Example:

Bid Curve	I	II	III
MWhs	30	40	50
Bid $/MWh	- 5	- 4	2

- *Each bid point exposure = MWhs * Bid $/MWh*
- *Bid Point 1 exposure = 30 * -5 * -1 = $150*
- *Bid Point 2 exposure = 40 * -4 * -1 = $160 ← Max Exposure*
- *Bid Point 3 exposure = 50 * 2 * -1 = ($100)*
- ***Bidding Requirement = $160***

Wheel Through Transactions

Operating Credit Requirements

Wheel Through – Operating Requirements

- Once the Day-Ahead Market's schedules and prices have been established after the DAM posts, the credit requirement for accepted Day-Ahead transactions will be :
  - *Scheduled MWhs in the Day-Ahead market multiplied by the (Day-Ahead Losses minus Day-Ahead Congestion)*

Example :

- DAM Scheduled MWhs = 50
- DAM Losses = $3, DAM Congestion = $-1
- ***Credit Requirement = 50 * (3 - (-1)) = $200***

- The calculation of the credit requirement for Hour-Ahead bids will remain the same.

Wheel Through – Operating Requirements

- Once the Real-Time Market's schedules and prices have been established after the completion of the energy hour indicated by the bid's date/time, the credit requirement will be:
  - *Day-Ahead calculation:*
    - The holding requirement will be reduced by the Balancing Payment.
    - Balancing Payment = Max((DAM Scheduled MWhs – Actual MWhs) * (RT losses - RT congestion),0)
  - *Hour-Ahead calculation:*
    - Max(Actual MWhs - DAM Scheduled MWhs),0) * RT price

Wheel Through – Operating Requirements

Example 1:

- DAM Scheduled MWhs = 50
- Actual MWhs = 40
- RT Losses = $3
- RT Congestion = - $2
- RT Losses – RT Congestion = 3 – (-2) = 5
- DAM Post Holding Requirement (from slide 39) = $200

DAM Post Holding **Balancing Payment**

- *Day-Ahead requirement = $200 - Max((50 - 40) * $5),0)*
  = $200 - $50
  = $150
- *Hour-Ahead requirement = Max((40 - 50) * 5),0) = $0.00*
- ***Transaction Operating Requirement = 150 + 0 = $150***

Wheel Through – Operating Requirements

Example 2:

- DAM Scheduled MWhs = 50
- Actual MWhs = 70
- RT Losses = $3
- RT Congestions = - $2
- RT Losses – RT Congestions = 3 – (-2) = $5
- DAM Post Holding requirement (from slide 39) = $200

DAM Post Holding | **Balancing Payment**

- *Day-Ahead requirement = $200 - Max((50 - 70) * $5),0)*
  = 200 - 0
  = $200
- *Hour-Ahead requirement = Max((70 - 50) * 5),0) = $100*
- ***Transaction Operating Requirement = 200 + 100 = $300***

Wheel Through Transactions

Actual Purchases/Sales

Wheel Through – Actual Purchases/Sales

- After the market day is complete, the credit requirement will equal the payments due to the NYISO as determined by the Daily Bill results for that market day.

Next Steps

- BIC/MC & BOD approval occurred in Q3 2009
- CPWG - additional details in September/October 2012
- CPWG – review of tariff changes – Q4 2012
- FERC Filing – March 2013
- Deployment scheduled for June 2013

Appendix

Virtual Supply Price Differential by Time-of-Day and Proxy Bus
4/1/2005 - 6/30/2012

HQ Wheel Proxy (PTID 23651)			
	Summer	Winter	Rest-of-Year
HB7-10	35.76	56.63	38.28
HB11-14	56.09	29.22	34.65
HB15-18	58.62	74.61	54.04
HB19-22	37.71	37.45	37.54
Holiday	38.15	55.17	31.62
Night	31.15	31.36	27.60

NE Proxy (PTID 24062)			
	Summer	Winter	Rest-of-Year
HB7-10	32.84	69.84	44.08
HB11-14	66.12	36.28	39.74
HB15-18	99.34	92.31	62.63
HB19-22	31.47	51.22	45.43
Holiday	41.79	78.09	47.57
Night	34.78	47.09	35.72

OH Proxy (PTID 24063)			
	Summer	Winter	Rest-of-Year
HB7-10	35.62	53.88	35.28
HB11-14	54.82	25.01	33.55
HB15-18	60.83	66.38	55.96
HB19-22	36.21	35.09	43.14
Holiday	33.91	43.51	30.50
Night	30.54	28.00	26.68

PJM Proxy (PTID 24065)			
	Summer	Winter	Rest-of-Year
HB7-10	31.95	61.00	36.08
HB11-14	81.59	23.88	33.59
HB15-18	130.42	72.99	60.54
HB19-22	28.81	37.61	37.08
Holiday	31.03	48.29	31.26
Night	24.78	30.18	24.38

NE CSC Proxy (PTID 323557) 6/2/2005-6/30/2012			
	Summer	Winter	Rest-of-Year
HB7-10	70.38	105.93	73.05
HB11-14	223.65	65.74	64.47
HB15-18	306.68	136.61	93.92
HB19-22	117.81	108.60	81.45
Holiday	90.68	95.61	73.19
Night	47.17	51.86	44.61

HQ Import Proxy (PTID 23651 pre-7/1/2007 and PTID 323601 since 7/1/2007)			
	Summer	Winter	Rest-of-Year
HB7-10	33.22	53.18	34.87
HB11-14	52.13	27.90	30.68
HB15-18	54.47	69.68	53.35
HB19-22	36.99	36.01	33.42
Holiday	35.78	54.50	29.13
Night	29.93	30.40	26.88

Appendix

Virtual Supply Price Differential by Time-of-Day and Proxy Bus 4/1/2005 - 6/30/2012

HQ Cedars Proxy (23651 pre-10/1/2008 and 323590 since 10/1/2008)			
	Summer	Winter	Rest-of-Year
HB7-10	36.03	55.11	37.20
HB11-14	56.96	29.57	34.29
HB15-18	58.62	73.48	54.07
HB19-22	38.39	37.45	38.20
Holiday	38.15	55.67	31.95
Night	31.52	31.83	27.60

NE 1385 Proxy (23551 pre-6/27/2007 and 323591 since 6/27/2007)			
	Summer	Winter	Rest-of-Year
HB7-10	70.21	106.74	76.22
HB11-14	231.84	68.55	71.28
HB15-18	285.29	139.80	94.62
HB19-22	102.72	93.18	84.07
Holiday	90.22	93.02	74.69
Night	45.47	51.15	47.59

PJM Neptune Proxy (24086 pre-5/9/2007 and 323594 since 5/9/2007)			
	Summer	Winter	Rest-of-Year
HB7-10	71.39	105.55	70.15
HB11-14	211.03	65.10	68.82
HB15-18	321.48	130.31	93.92
HB19-22	100.81	93.53	77.51
Holiday	96.90	93.09	73.80
Night	44.12	50.67	45.51

PJM VFT Proxy (23786 pre-9/16/2009 and 323633 since 9/16/2009)			
	Summer	Winter	Rest-of-Year
HB7-10	45.49	94.66	71.80
HB11-14	136.28	67.68	62.84
HB15-18	270.60	108.03	88.47
HB19-22	47.81	67.11	62.13
Holiday	61.95	73.81	60.54
Night	45.84	49.31	39.38

Appendix

Virtual Load Price Differential by Time-of-Day and Proxy Bus
4/1/2005 - 6/30/2012

HQ Wheel Proxy (PTID 23651)			
	Summer	Winter	Rest-of-Year
HB7-10	46.43	49.31	35.39
HB11-14	56.57	35.41	33.04
HB15-18	65.00	54.37	37.58
HB19-22	51.84	47.58	34.59
Holiday	51.97	46.21	35.63
Night	38.66	43.02	35.41

NE Proxy (PTID 24062)			
	Summer	Winter	Rest-of-Year
HB7-10	33.68	44.95	33.33
HB11-14	51.15	36.51	32.53
HB15-18	57.56	59.76	36.84
HB19-22	38.37	45.65	33.62
Holiday	41.23	43.88	34.72
Night	34.08	39.22	32.47

OH Proxy (PTID 24063)			
	Summer	Winter	Rest-of-Year
HB7-10	29.94	39.32	28.81
HB11-14	41.45	31.48	28.35
HB15-18	46.25	42.97	29.40
HB19-22	36.90	34.59	28.97
Holiday	35.56	38.99	29.50
Night	33.88	34.58	30.82

PJM Proxy (PTID 24065)			
	Summer	Winter	Rest-of-Year
HB7-10	31.89	37.98	30.22
HB11-14	48.93	35.03	31.29
HB15-18	57.03	52.35	34.72
HB19-22	35.56	39.16	32.87
Holiday	40.00	38.40	31.66
Night	33.67	34.99	31.32

NE CSC Proxy (PTID 323557) 6/2/2005-6/30/2012			
	Summer	Winter	Rest-of-Year
HB7-10	41.29	54.94	35.13
HB11-14	88.57	49.39	40.64
HB15-18	109.80	72.88	53.37
HB19-22	59.97	65.95	47.45
Holiday	62.79	61.43	43.63
Night	43.73	47.60	39.37

HQ Import Proxy (PTID 23651 pre-7/1/2007 and PTID 323601 since 7/1/2007)			
	Summer	Winter	Rest-of-Year
HB7-10	56.97	53.31	38.20
HB11-14	69.71	36.09	35.31
HB15-18	75.64	58.02	39.14
HB19-22	60.19	49.19	38.09
Holiday	48.76	47.85	37.40
Night	38.60	43.19	37.68

Appendix

Virtual Load Price Differential by Time-of-Day and Proxy Bus
4/1/2005 - 6/30/2012

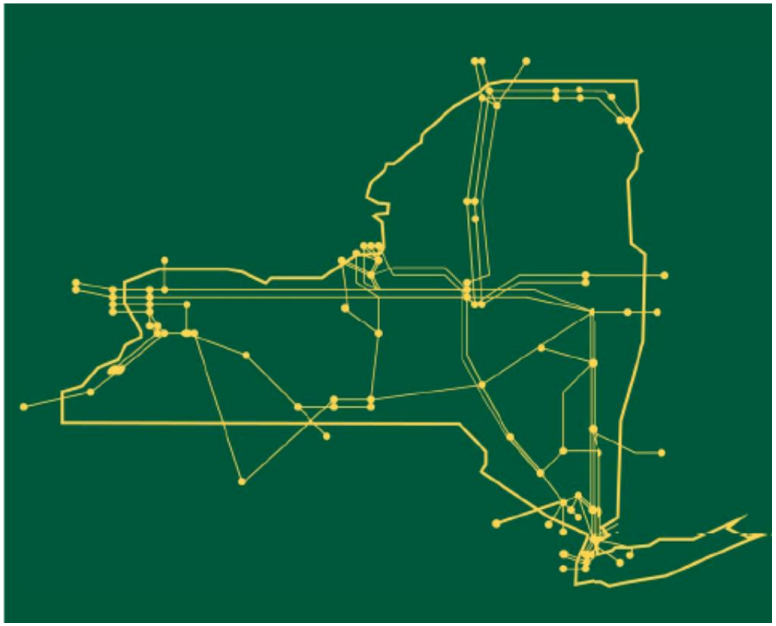
HQ Cedars Proxy (23651 pre-10/1/2008 and 323590 since 10/1/2008)			
	Summer	Winter	Rest-of-Year
HB7-10	45.60	50.24	33.73
HB11-14	55.29	35.58	32.27
HB15-18	62.34	54.70	37.19
HB19-22	47.15	47.14	34.10
Holiday	51.39	45.44	35.39
Night	38.26	42.64	35.22

NE 1385 Proxy (23551 pre-6/27/2007 and 323591 since 6/27/2007)			
	Summer	Winter	Rest-of-Year
HB7-10	43.80	53.46	36.25
HB11-14	68.77	48.84	41.42
HB15-18	97.50	75.07	53.09
HB19-22	52.67	68.64	47.10
Holiday	52.06	66.50	43.68
Night	44.54	48.34	38.93

PJM Neptune Proxy (24086 pre-5/9/2007 and 323594 since 5/9/2007)			
	Summer	Winter	Rest-of-Year
HB7-10	39.11	52.37	35.40
HB11-14	81.87	47.65	39.58
HB15-18	107.08	70.88	52.41
HB19-22	54.24	64.74	46.95
Holiday	56.64	57.93	43.06
Night	42.15	46.47	38.92

PJM VFT Proxy (23786 pre-9/16/2009 and 323633 since 9/16/2009)			
	Summer	Winter	Rest-of-Year
HB7-10	47.36	52.32	41.06
HB11-14	48.17	53.84	49.35
HB15-18	56.14	64.30	51.40
HB19-22	42.93	50.84	42.04
Holiday	46.86	46.04	41.46
Night	39.53	41.34	36.99

The New York Independent System Operator (NYISO) is a not-for-profit corporation responsible for operating the state's bulk electricity grid, administering New York's competitive wholesale electricity markets, conducting comprehensive long-term planning for the state's electric power system, and advancing the technological infrastructure of the electric system serving the Empire State.



www.nyiso.com