

Joint Energy Scheduling System (JESS) Enhancements and...

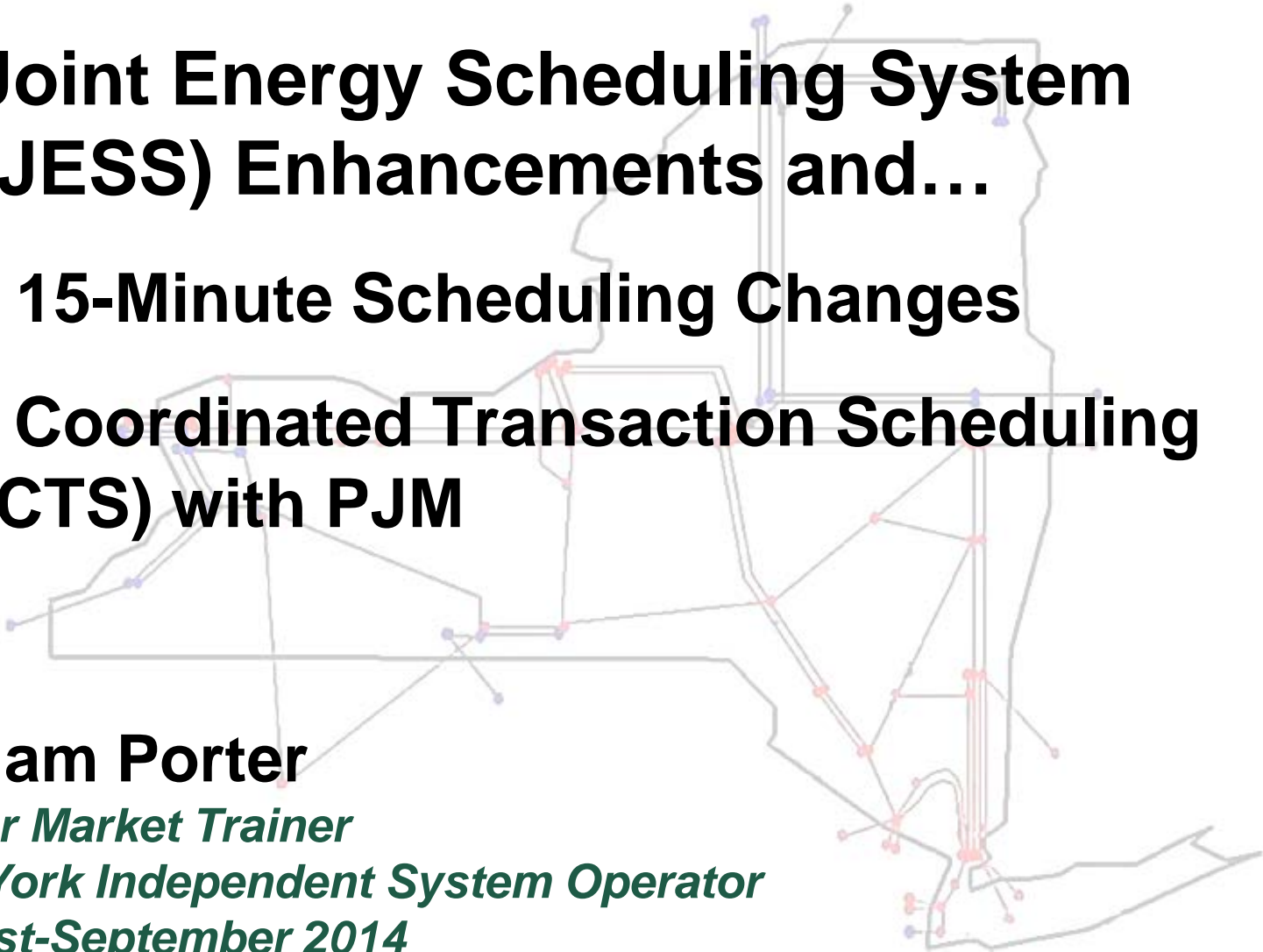
- **15-Minute Scheduling Changes**
- **Coordinated Transaction Scheduling (CTS) with PJM**

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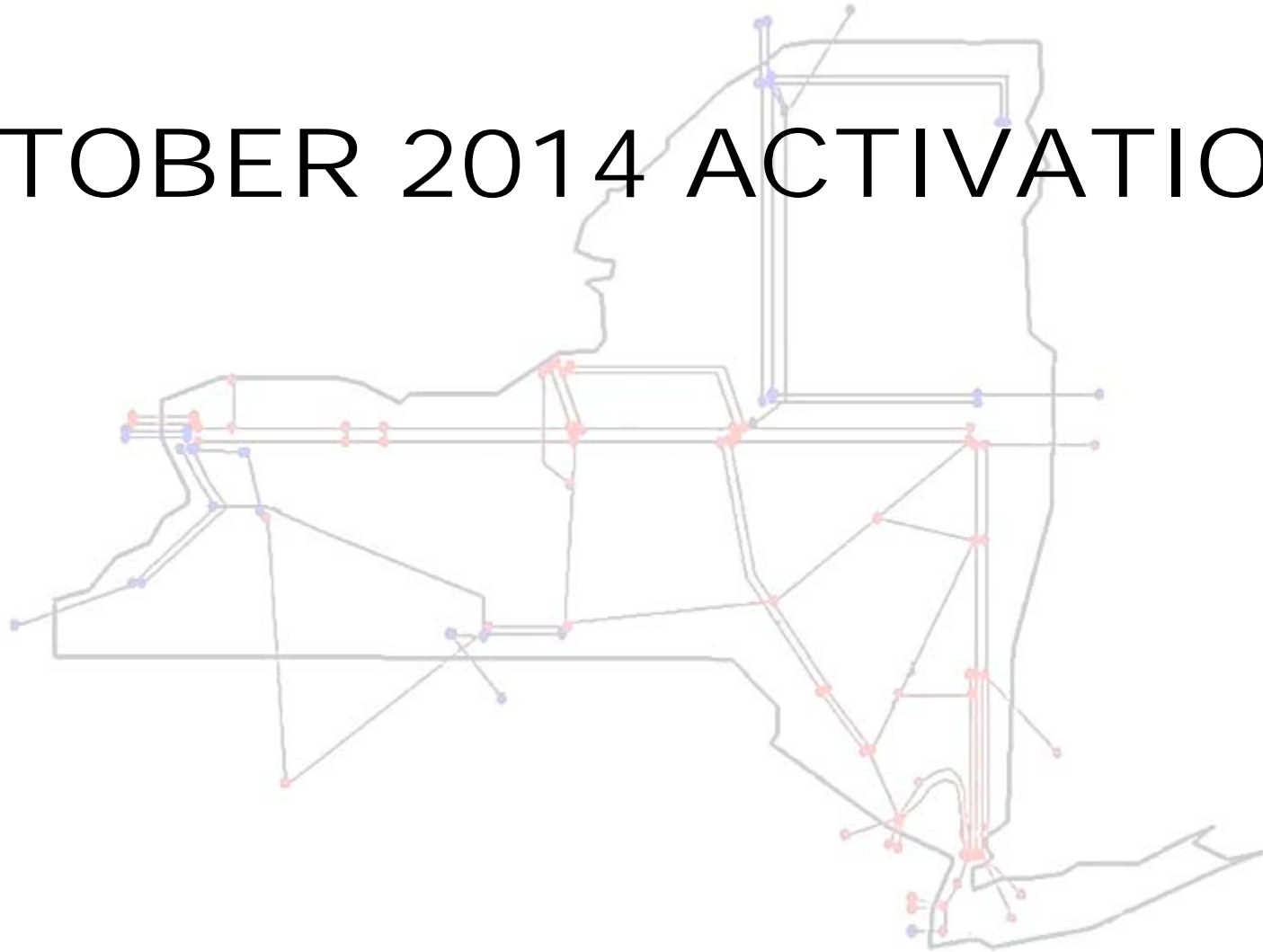
August-September 2014



Training Topics

- ◆ Using 4 distinct bid curves in each hour
- ◆ Improved (shortened) RT Scheduling Horizon
- ◆ Concepts of CTS Bidding
- ◆ Submitting CTS transaction bids in JESS
- ◆ Upload/Download changes-impacts all those who use external transactions !
- ◆ Sandbox testing information
- ◆ All Data shown is fictitious !

OCTOBER 2014 ACTIVATION



October Activation Summary

Bidding and Scheduling (LBMP Bids)

- ◆ Individual 1-11 point bid curves for *each* quarter hour, must specify bid curves for *all* 4 quarters of the hour, **or**...a *single* bid curve for the entire hour
 - *This new feature applies to the PJM proxies* and Hydro-Quebec-Chateauguay (HQ_GEN_IMPORT, HQ_GEN_EXPORT)*
- ◆ Establishment of 15-Min Schedules 15 minutes closer to actual flow (T-15 instead of T-30)
- ◆ Changes to the JESS user interface and Upload/Download templates will impact all JESS users, *i.e.*, any MP offering or bidding external energy transactions at any external proxy bus....to be discussed later

**Keystone, Linden VFT, HTP, Neptune*

NOVEMBER 2014 ACTIVATION: COORDINATED TRANSACTION SCHEDULING (CTS) WITH PJM

CTS bids will be scheduled based on the projected price difference between the NYISO and PJM at the interface

November-Activation Summary

Bidding and Scheduling (CTS Bids)

- ◆ **Users have new option to specify:**
 - *CTS bids, which will be scheduled based on the projected price difference between PJM and NYISO at the interface-examples to follow (Intra-Hour/15m evaluations)*
 - *CTS Bids may have 4 distinct one-to-eleven (11) point bid curves, one for each 15-minute scheduling interval of the hour*
 - *In such case, must specify bid curves for all four quarters of the hour...or, a single bid curve for the entire hour*
 - *Hourly scheduling (except wheel-throughs) will no longer be available at the PJM Proxies*

MECHANICS OF 15-MINUTE LBMP AND CTS BID SUBMITTAL



Review of Contracts vs Bids

Logged in as: DEMO_USER_NAME

Upload/Download

Visit Marketplace

Logout

Joint Energy Scheduling

Switch Between Contracts & Bids



Contracts

Bids

Contract Search Results (45)

Create Contract

ID	Source	Sink	User Ref	Last Update User	Last Update	Type	Action(s)
3829176	NIAGARA	PJM_LOAD_KEystone	USER_REF_NAME	LAST_UPDATE_USER	12/19/2013 13:28 EST	Transaction	Action(s)
3829177	NIAGARA	PJM_LOAD_KEystone	USER_REF_NAME	LAST_UPDATE_USER	12/19/2013 13:37 EST	Transaction	Action(s)
3829178	ST LAWRENCE	PJM_LOAD_KEystone	USER_REF_NAME	LAST_UPDATE_USER	12/19/2013 13:02 EST	Transaction	Action(s)
3829179	ST LAWRENCE	PJM_LOAD_KEystone	USER_REF_NAME	LAST_UPDATE_USER	12/19/2013 13:03 EST	Transaction	Action(s)
3829180	NIAGARA	PJM_LOAD_KEystone	USER_REF_NAME	LAST_UPDATE_USER	12/19/2013 13:01 EST	Transaction	Action(s)
3829181	NIAGARA	PJM_LOAD_KEystone	USER_REF_NAME	LAST_UPDATE_USER	12/19/2013 14:35 EST	Transaction	Action(s)
3829182	NIAGARA	NE_LOAD_SANDY PD	USER_REF_NAME	LAST_UPDATE_USER	12/19/2013 15:11 EST	Transaction	Action(s)
3829183	NIAGARA	NE_LOAD_SANDY PD	USER_REF_NAME	LAST_UPDATE_USER	12/18/2013 06:02 EST	Transaction	Action(s)
3829184	NIAGARA	NE_LOAD_SANDY PD	USER_REF_NAME	LAST_UPDATE_USER	12/18/2013 06:02 EST	Transaction	Action(s)
3829185	NIAGARA	NE_LOAD_SANDY PD	USER_REF_NAME	LAST_UPDATE_USER	12/18/2013 06:02 EST	Transaction	Action(s)
3829186	ST LAWRENCE	NE_LOAD_SANDY PD	USER_REF_NAME	LAST_UPDATE_USER	12/18/2013 06:02 EST	Transaction	Action(s)
3829187	ST LAWRENCE	NE_LOAD_SANDY PD	USER_REF_NAME	LAST_UPDATE_USER	12/18/2013 06:02 EST	Transaction	Action(s)
3829188	NIAGARA	PJM_LOAD_KEystone	USER_REF_NAME	LAST_UPDATE_USER	12/18/2013 06:02 EST	Transaction	Action(s)
3829189	ST LAWRENCE	PJM_LOAD_KEystone	USER_REF_NAME	LAST_UPDATE_USER	06/11/2011 06:02 EDT	Transaction	Action(s)
3829190	NIAGARA	PJM_LOAD_KEystone	USER_REF_NAME	LAST_UPDATE_USER	12/18/2013 06:02 EST	Transaction	Action(s)

Search Contracts

Transaction ID:

Transaction Type:
None Selected

Source:
None Selected

Sink:
None Selected

NERC Priority:
None Selected

User Ref:

reset

search

Actions for Selected:

Delete Reassign

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Contracts vs Bids and Settlement

Creating a <u>Contract</u>: “Transaction Type” choices are either:	Drop-Down <u>Source</u>	Drop-Down <u>Sink</u>	“Schedule Type” Drop-Down <u>bid</u> types	Settlement- tied to <u>Contract type</u>, not bid*
<u>External LBMP</u> (import/export)	Proxies and NYISO Reference Bus	Proxies and NYISO Reference Bus	Hourly LBMP 15-Min LBMP 15-Min CTS	“LBMP” receive/pay Proxy LBMP
<u>External Bilateral</u> (import/export)	Proxies and NYCA Gens	Proxies and NYCA Load Buses	Hourly LBMP 15-Min LBMP 15-Min CTS	“Bilateral” (aka “TUC”) pay/receive Transmission Usage Charges (TUCs)

* for Transaction settlement information, see the Accounting and Billing Manual, or Billing & Accounting Workshop, or NYMOC Energy Market Transaction slides

15-Minute Bid Curve Activation

- ◆ Again, the *separate and distinct* 15-minute bid curve feature will be activated following the October software deployment, prior to activation of CTS bidding in November
- ◆ 15-minute bid curve feature will be available at any proxy which supports 15-minute scheduling (PJM/HQ-CHAT)
- ◆ Note that the eTag profile associated with this bid must be equal to the maximum energy profile MW of the four submitted bid curves.

15-minute Bid Curves Overview

- ◆ *Bid curve fields include:*
 - *Energy Profile MW*
 - *Price (1-11)*
 - *MW (1-11)*
- ◆ Remember, Users have option to specify either:
 - *Individual bid curves for each quarter hour, must specify bid curves for all four quarters of the hour**
 - *a single bid curve for entire hour*
 - *Available for intra-hour bid Schedule Types: 15-Min LBMP**, 15-Min CTS****


*one bid/transaction/hour

**October

***November

15-minute Bid Curves in JESS

Logged in as: NYISO Bidder Upload Download Bid Parameters Logout

Joint Energy Scheduling System 

Dashboard > Bidding

Contract Details New Contract created

Transaction ID: 11030090

Source: PJM_GEN_HTP_PROXY Sink: NYISO_LBMP_REFERENCE
 User Reference: MY USER REF Multi-Hour Block Transaction: No

You are receiving curtailment notifications for this Contract.
 Your Organization is the Financially Responsible Party (TRP) for this Contract.
 PJM_GEN_HTP_PROXY is a Merchant Transmission Facility which requires a valid reservation.

New Bid In Progress

Bid Date: 06/25/2014 00:00 EDT
 Num Hours: 1 Market: HAM Schedule Type: 15-Mn CTS
 SCA: 01 PSE: NY PSE Unique Num: 123 NCA: NYIS

Curve Time Frame: 00:00 - 00:14 Energy Profile HW: 10

Point	1	2	3	4	5	6	7	8	9	10	11
MW	10	20	30	40	50	60	70	80	90	100	110
\$ Price	10	20	30	40	50	60	70	80	90	100	110

use single curve default curve

Curve Time Frame: 00:15 - 00:29 Energy Profile HW: 11

Point	1	2	3	4	5	6	7	8	9	10	11
MW	1	2	3	4	5	6	7	8	9	10	11
\$ Price	1	2	3	4	5	6	7	8	9	10	11

default curve

Curve Time Frame: 00:30 - 00:44 Energy Profile HW: 20

Point	1	2	3	4	5	6	7	8	9	10	11
MW	20	30									
\$ Price	20	30									

default curve

Curve Time Frame: 00:45 - 00:59 Energy Profile HW: 13

Point	1	2	3	4	5	6	7	8	9	10	11
MW	10	20	30	40	50	60	70	80	90	100	110
\$ Price	10	20	30	40	50	60	70	80	90	100	110

default curve

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15-minute Bid Curves in JESS

Joint Energy Scheduling System

Contract Details

Transaction ID: [blank]
 Search P.M. [blank] L. [blank]
 Date: 02/26/2014 10:00

Curve Time Frame: 00:00 - 00:14 Energy Profile MW: 10

Point	1	2	3	4	5	6	7	8	9	10	11
MW	10	20	30	40	50	60	70	80	90	100	110
\$ Price	10	20	30	40	50	60	70	80	90	100	110

Clear Curve use single curve default curve

Curve Time Frame: 00:15 - 00:29 Energy Profile MW: 11

Point	1	2	3	4	5	6	7	8	9	10	11
MW	1	2	3	4	5	6	7	8	9	10	11
\$ Price	1	2	3	4	5	6	7	8	9	10	11

Clear Curve Copy Previous Curve default curve

Curve Time Frame: 00:30 - 00:44 Energy Profile MW: 20

Point	1	2	3	4	5	6	7	8	9	10	11
MW	20	30									
\$ Price	20	30									

Clear Curve Copy Previous Curve default curve

Curve Time Frame: 00:45 - 00:59 Energy Profile MW: 13

Point	1	2	3	4	5	6	7	8	9	10	11
MW	10	20	30	40	50	60	70	80	90	100	110
\$ Price	10	20	30	40	50	60	70	80	90	100	110

Clear Curve Copy Previous Curve default curve

Simple example of 15-minute LBMP Import Bid Evaluation

- Import Bid: minimum you are willing to be paid for delivering a stated # of MWs

The screenshot displays the ISO New York LBMP Import Bid Evaluation interface, showing four 15-minute time frames. Each time frame includes a table of MW values and their corresponding prices. Red circles highlight specific MW values, and callout boxes provide the RT LBMP price for each time frame. A red 'X' is drawn over the 00:30-00:44 time frame, indicating it is out of the money.

Time Frame	Energy Profile MW	RT LBMP Price
00:00-00:14	100	\$32
00:15-00:29	11	\$5.90
00:30-00:44	20	\$15
00:45-00:59	100	\$75

No schedule ! Out of the money

15-minute Bid Curves

Default Bid Curve Requirement

- ◆ When using 15-minute bid curve feature, the user must specify one of the four curves as the default bid curve
- ◆ The default bid curve will be used to perform an hourly evaluation of the bid in the event that 15-minute scheduling has been disabled →

15-minute Bid Curves

Default Curve radio button

Contract De

Transaction In

Search P.00 2014

New Bid

Clear Curve

use single curve: default curve:

Curve Time Frame: 00:15 - 00:29 Energy Profile MW: 11

Point	1	2	3	4	5	6	7	8	9	10	11
MW	1	2	3	4	30		7	8	9	10	11
\$ Price	1	2	3		30		7	8	9	10	11

Clear Curve Copy Previous Curve default curve: default curve: ?

Curve Time Frame: 00:30 - 00:44 Energy Profile MW: 20

Point	1	2	3	4	5	6	7	8	9	10	11
MW	20	30			Energy Profile MW: 11						
\$ Price	20	30									

Clear Curve Copy Previous Curve default curve:

Curve Time Frame: 00:45 - 00:59 Energy Profile MW: 13

Point	1	2	3	4	5	6	7	8	9	10	11
MW	10	20	30	40	50	60	70	80	90	100	110
\$ Price	10	20	30	40	50	60	70	80	90	100	110

Clear Curve Copy Previous Curve default curve:

November

How to Submit a CTS Bid

- ◆ CTS bids will be managed using same bidding screens and templates as existing LBMP type transaction bids
- ◆ User should specify “15-Min CTS” in “Schedule Type” field in JESS User Interface –see next slide
- ◆ Existing “Schedule Type” terms will be updated (old term => new term):
 - *Intra-Hourly => 15-Min LBMP*
 - *Hourly => Hourly LBMP*

Submitting a CTS Bid in JESS

[Upload/Download](#) | [Visit Marketplace](#) | [Logout](#)

Joint Energy Scheduling System

[Dashboard](#) > [Bidding](#)

Contract Details

Transaction ID: 11535090

Source: PJM_GEN_HTP_PROXY **Sink:** NYISO_LBMP_REFERENCE

User Reference: MY USER REF **Multi-Hour Block Transaction:** No

New Bid

Contract Status: New Contract created

*You are receiving curtailment notifications for this Contract.
Your Organization is the Financially Responsible Party ("FRP") for this Contract.
PJM_GEN_HTP_PROXY is a Merchant Transmission Facility, which requires a valid reservation.*

Contract Status: In Progress

Schedule Type: ?

- 15-Min CTS
- Hourly LBMP
- 15-Min LBMP
- 15-Min CTS

Bid Date: 06/25/2014 00:00 EDT

Num Hours: 1 **Market:** HAM

Schedule Type: 15-Min CTS

NERC Tag: SCA: 01 PSE: MY PSE Unique Num: 123 RCA: NYIS

Curve Time Frame: 00:00 - 00:14 **Energy Profile MW:** 10

Point	1	2	3	4	5	6	7	8	9	10	11
MW	10	20	30	40	50	60	70	80	90	100	110
\$ Price	10	20	30	40	50	60	70	80	90	100	110

 use single curve:
 default curve:

CTS Bids –Schedule Type

- ◆ Again, when submitting a transaction bid the user must specify a Schedule Type:
 - *Hourly LBMP*
 - *15-Min LBMP*
 - *15-Min CTS*
- ◆ Indicates how the bid will be evaluated in Real-Time Market only, not DAM
- ◆ Required for DAM bids to indicate type of bid to create for Real-Time Market following DAM checkout

CTS Bids –RTM Bid Price

- ◆ When submitting DAM bid with CTS Schedule Type, the user must specify a “RTM Bid Price” to be used when creating Real-Time Market bid following DAM checkout
- ◆ For LBMP type bids the ISO will continue to use the default values if not specified by the user:
 - *Imports* $-\$0.01$
 - *Exports* $+\$1,000$
 - *Wheels* $-\$1,000$

Bid Accepted Screen

Logged in as: DEMO_USER_NAME

Upload/Download Visit Marketplace Logout

Joint Energy Scheduling System



Dashboard > Bidding

Contract Details

Transaction ID: XXXXXXXX Multi-Hour Block Transaction: No NERC Priority: FIRM (F-7)
 Source: ST LAWRENCE____ Sink: PJM_LOAD_KEYSTONE User Ref: USER_REF_NAME

Contract details are read only

Bid Details (BID ACCEPTED)

Bid Status: BID ACCEPTED	
Bid Date	12/18/2013 00:00 EST
Market	HAM
Schedule Type	Hourly LBMP

Nerc Tag: valid			
SCA	PSE	Unique Num	RCA
XXXX	XXXXXX	XX0000	XXX

Confirmations		
FRP	Buyer	Seller
Y	Y	Y

- Bid Messages (2)
- o HAM bid created from approved DAM schedule.
 - o Evaluation fully accepted transaction.

Bid Schedules & Curve

Bid details are read only

Bid messages

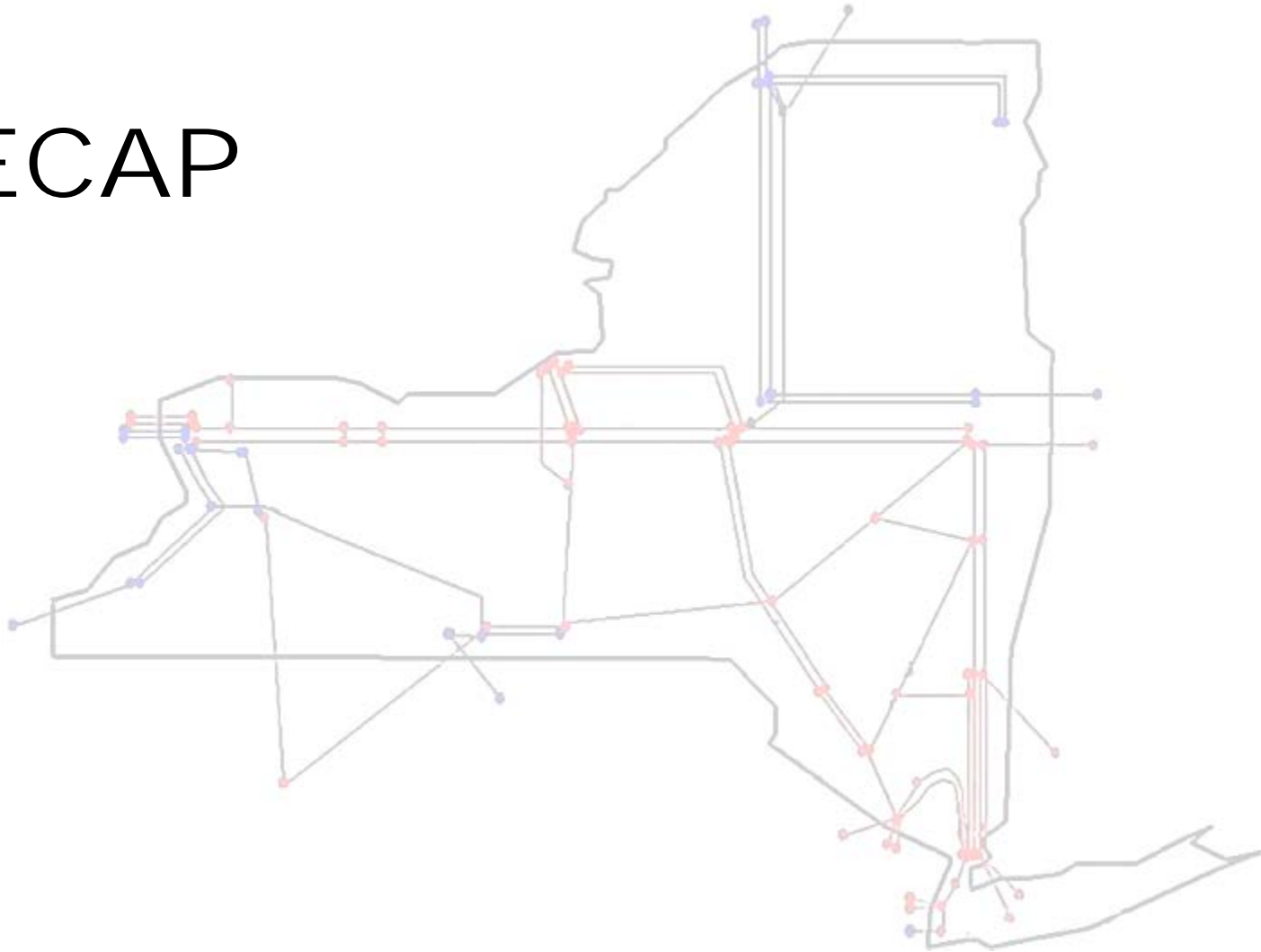
RTD	Scheduled	-	17	17	17	17	17	17	17	17	17	17	17	17
	01/06/2014 00 EST	:00	:05	:10	:15	:20	:25	:30	:35	:40	:45	:50	:55	:60
HAM	Scheduled		17		17		17		17		17		-	-
	Checked Out		17		17		17		17		17		-	-

RTD and HAM Schedule and checkout MW

Bid Curve		Energy Profile MW 17											
		1	2	3	4	5	6	7	8	9	10	11	12
Cost	1000												
MW	17												

Read only bid curve

RECAP



Recap: Bid Type Options for PJM Proxies

	OCTOBER Activation	NOVEMBER Activation
15-Min LBMP	Yes	Yes
15-Min CTS	No	Yes
Hourly LBMP: Import/Export	Yes*	No
Hourly LBMP: Wheels	Yes*	Yes*

PJM Proxies: Keystone, HTP, Neptune, VFT

*unchanged

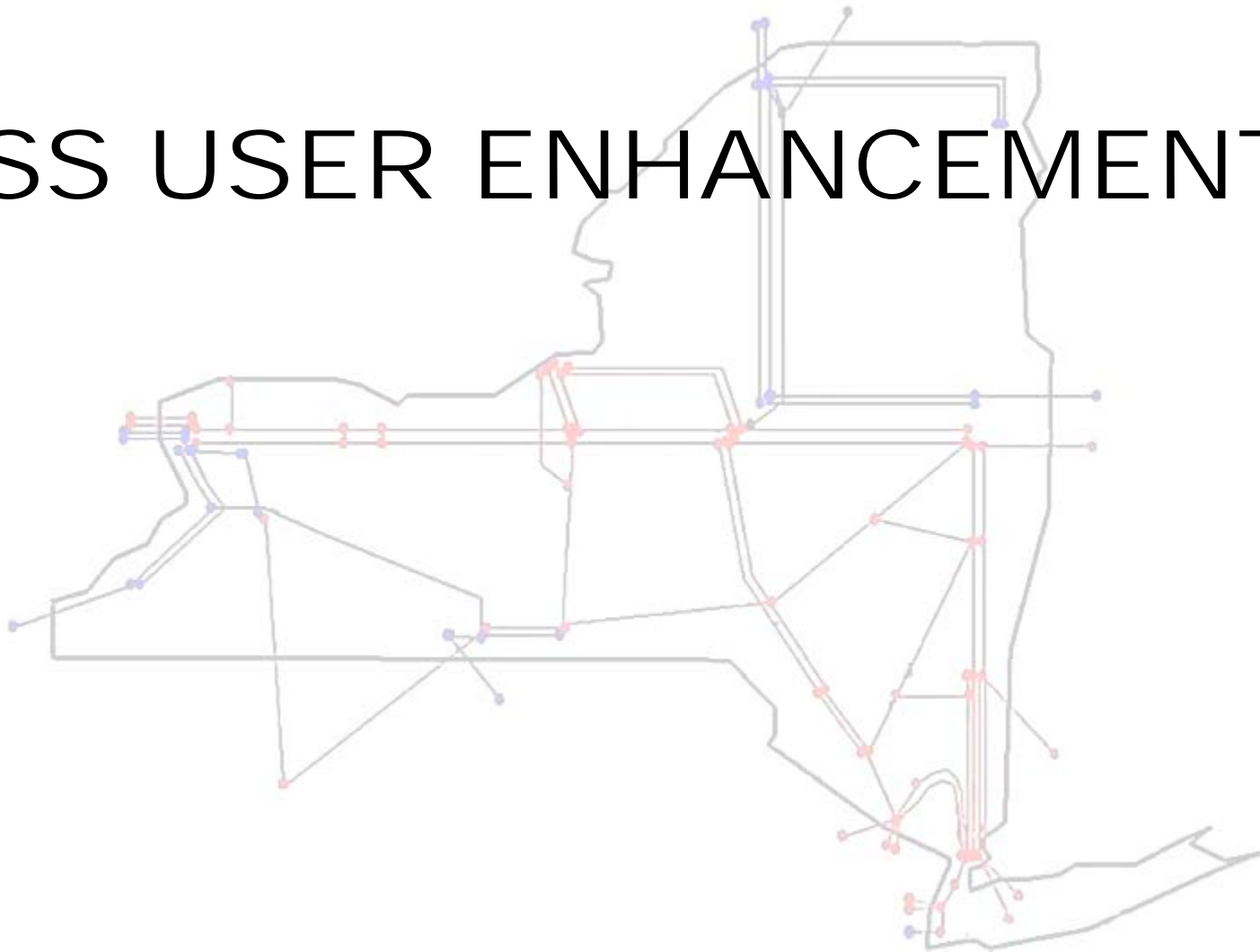
Recap: Bid Type Options for Hydro-Quebec Proxies

	OCTOBER Activation	NOVEMBER Activation
15-Min LBMP	Yes	Yes
15-Min CTS	No	No
Hourly LBMP: Import/Export	Yes*	Yes*
Hourly LBMP: Wheels	Yes*	Yes*

HQ_GEN_IMPORT, HQ_LOAD_EXPORT (Chateauguay)

*unchanged

JESS USER ENHANCEMENTS



JESS User Enhancements

- ◆ Ability to search for bids on individual NERC Tag fields:
 - *SCA*
 - *PSE*
 - *Unique #*
 - *RCA*
- ◆ Screen Tips; provide users with additional information within JESS User Interface
- ◆ See next two slides for examples

NERC Tag Search

Logged in as: NYISO Bidder Upload/Download View Marketplace Logout

Joint Energy Scheduling System

Contracts Bids

Bid Search Results (886) Create Bid

Transaction ID	Date/Time	Market	Source	Sink	Bid Status	User Ref	Conditions			Action(s)
							FRP	Buyer	Seller	
1	06/20/2014 23:00 EDT	HAM	NYISO_LBMP_REFERENCE	NE_LOAD_SANDY PD	VALIDATION PASSED	MY USER REF	Y	Y	Y	Action(s)
2	06/20/2014 23:00 EDT	HAM	NYISO_LBMP_REFERENCE	NE_LOAD_SANDY PD	VALIDATION PASSED	MY USER REF	Y	Y	Y	Action(s)
3	06/20/2014 23:00									
4	06/20/2014 23:00									
5	06/20/2014 23:00									
6	06/20/2014 23:00									
7	06/20/2014 23:00									
8	06/20/2014 23:00 EDT	HAM	NYISO_LBMP_REFERENCE	PJM_LOAD_KEYSTONE	VALIDATION PASSED	MY USER REF	Y	Y	Y	Action(s)
9	06/20/2014 23:00 EDT	HAM	NYISO_LBMP_REFERENCE	PJM_LOAD_KEYSTONE	VALIDATION PASSED	MY USER REF	Y	Y	Y	Action(s)
10	06/20/2014 23:00 EDT	HAM	NYISO_LBMP_REFERENCE	NE_LOAD_SANDY PD	VALIDATION PASSED	MY USER REF	Y	Y	Y	Action(s)
11	06/20/2014 23:00 EDT	HAM	NYISO_LBMP_REFERENCE	NE_LOAD_SANDY PD	VALIDATION PASSED	MY USER REF	Y	Y	Y	Action(s)
12	06/20/2014 23:00 EDT	HAM	NYISO_LBMP_REFERENCE	NE_LOAD_SANDY PD	VALIDATION PASSED	MY USER REF	Y	Y	Y	Action(s)
13	06/20/2014 23:00 EDT	HAM	NYISO_LBMP_REFERENCE	NE_LOAD_SANDY PD	VALIDATION PASSED	MY USER REF	Y	Y	Y	Action(s)
14	06/20/2014 23:00 EDT	HAM	NYISO_LBMP_REFERENCE	PJM_LOAD_KEYSTONE	VALIDATION PASSED	MY USER REF	Y	Y	Y	Action(s)
15	06/20/2014 23:00 EDT	HAM	NYISO_LBMP_REFERENCE	PJM_LOAD_KEYSTONE	VALIDATION PASSED	MY USER REF	Y	Y	Y	Action(s)
16	06/20/2014 23:00 EDT	HAM	NYISO_LBMP_REFERENCE	PJM_LOAD_KEYSTONE	VALIDATION PASSED	MY USER REF	Y	Y	Y	Action(s)
17	06/20/2014 23:00 EDT	HAM	NYISO_LBMP_REFERENCE	PJM_LOAD_KEYSTONE	VALIDATION PASSED	MY USER REF	Y	Y	Y	Action(s)
18	06/20/2014 22:00 EDT	HAM	NYISO_LBMP_REFERENCE	NE_LOAD_SANDY PD	VALIDATION PASSED	MY USER REF	Y	Y	Y	Action(s)
19	06/20/2014 22:00 EDT	HAM	NYISO_LBMP_REFERENCE	NE_LOAD_SANDY PD	VALIDATION PASSED	MY USER REF	Y	Y	Y	Action(s)

NOTE: SELECTED

NERC Tag:

SCA PSE Unique # RCA

Contract Filters

Search Bids

Start Date: 06/20/2014 00:00 EDT

End Date: 06/20/2014 23:01 EDT

Market: None Selected

Bid Schedule Type: None Selected

NERC Tag: SCA PSE Unique # RCA

Contract Filters

Transaction ID:

User Ref:

Transaction Type: None Selected

Source: NYISO_LBMP_REFERENCE

Sink: None Selected

Status Filters

Bid Status: None Selected

NERC Tag Status: None Selected

FRP Status: None Selected

Buyer Status: None Selected

Seller Status: None Selected

reset search

Actions for Selected:

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Screen Tips

New Bid

In Progress

Bid Date: 06/25/2014 00:00 EDT
Num Hours: 1
Market: HAM
Schedule Type: 15-Min CTS
NERC Tag:
SCA: 01
PSE: MY PSE
Unique Num: 123
RCA: NYIS

Curve Time Frame: 00:00 - 00:14 **Energy Profile MW:** 10

Point	1	2	3	4	5	6	7	8	9	10	11
MW	10	20	30	40	50	60	70	80	90	100	110
\$ Price:	10	20	30	40	50	60	70	80	90	100	110

use single curve:
 default curve:



Default Bid Curve
 Identifies which one of the four bid curves will be used for scheduling for the entire hour in the event that 15-minute scheduling has been disabled.

Curve Time Frame: 00:15 - 00:29 **Energy Profile MW:** 11

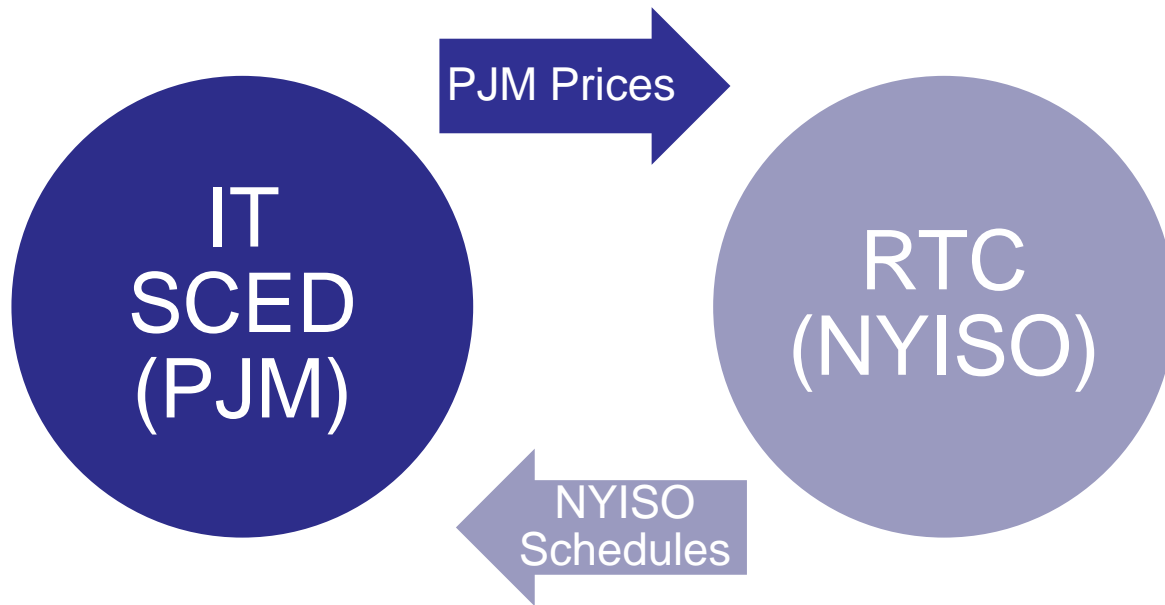
Point	1	2	3	4	5	6	7	8	9	10	11
MW	1	2	3	4	5	6	7	8	9	10	11
\$ Price:	1	2	3	4	5	6	7	8	9	10	11

default curve:

CTS MARKET EXAMPLES



How it will work



In Real Time,

- ◆ **NYISO will incorporate PJM's forward looking prices into its existing scheduling process for the purpose of evaluating CTS bids.**
- ◆ **PJM will incorporate advisory schedules from NYISO's scheduling process for the purpose of determining its forward-looking prices.**

Example with Timeline

- ◆ This example includes the following simplifying assumptions:
 - *The marketer is assumed to be purchasing in PJM at the PJM price, importing energy from PJM into NY and selling the energy in NY at the NY price.*

- ◆ This example (in purple) focuses on scheduling a single 15 minute interval from T to T+15
 - *Every 15 minutes the NYISO provides RTC advisory schedules to PJM which are incorporated into the PJM ramp calculation and every 15 minutes RTC incorporates the expected prices from PJM. The example only includes time steps relevant to scheduling a transaction for the interval from T to T+15.*

Example with Timeline (2)

- ◆ **Before T-75:**
 - *Marketer meets all PJM scheduling requirements*
 - *In the NYISO's JESS the marketer enters an import (from PJM to NY) CTS Transaction bid of \$5/MWh for the first fifteen minutes of hour T*
 - *The marketer also enters import CTS Transaction bids for the other three intervals in hour T*

Example with Timeline (3)

- ◆ **T-75:**
 - *NYISO locks bids, removes bids with no eTags and curtails to zero eTags with no bids*
 - *NYISO bid evaluation process begins*
- ◆ **T-60:**
 - *NYISO RTC sends schedules to PJM*
- ◆ **T-40:**
 - *PJM sends prices for T to NYISO RTC:*
 - *PJM projects an Interval 2 price of \$17/MWh*

Example with Timeline (4)

- ◆ **T-30 to T-15:**
 - *Rolling RTC evaluates and posts, CTS schedules are established for first fifteen minutes of hour T,*
 - *The RTC projects prices of \$23/MWh for the first interval of hour T.*
 - *Since PJM's price projection was \$17/MWh and RTC's projected price is \$23/MWh, the CTS Transaction is scheduled ($\$17/\text{MWh} + \$5/\text{MWh} = \$22/\text{MWh} < \$23/\text{MWh}$).*
 - *eTags updated with the RTC schedules*
 - *NYISO RTC sends look-ahead schedules to PJM*

Example with Timeline (5)

- ◆ **T-10 to T-5:**
 - *Rolling NYISO RTD evaluates and posts for T-5 to T.*
- ◆ **T-5 to T:**
 - *Rolling RTD posts and sets first 5 minute NYISO settlement price of \$24/MWh.*
- ◆ **T:**
 - *PJM first 5 minute RT LMP price of \$15/MWh.*

Example with Timeline (6)

- ◆ ***T to T+5:***
 - ***Rolling RTD posts second 5 minute NYISO settlement price for t+5 to t+10 of \$19/MWh***

- ◆ ***T+5:***
 - ***PJM second 5 minute RT LMP of \$20/MWh***

- ◆ ***T+5 to T+10:***
 - ***Rolling RTD posts third 5 minute NYISO settlement price for t+10 to t+15 of \$29/MWh***

- ◆ ***T+10:***
 - ***PJM third 5 minute RT LMP of \$25/MWh.***

Example with Timeline (7)

◆ Income Statement:

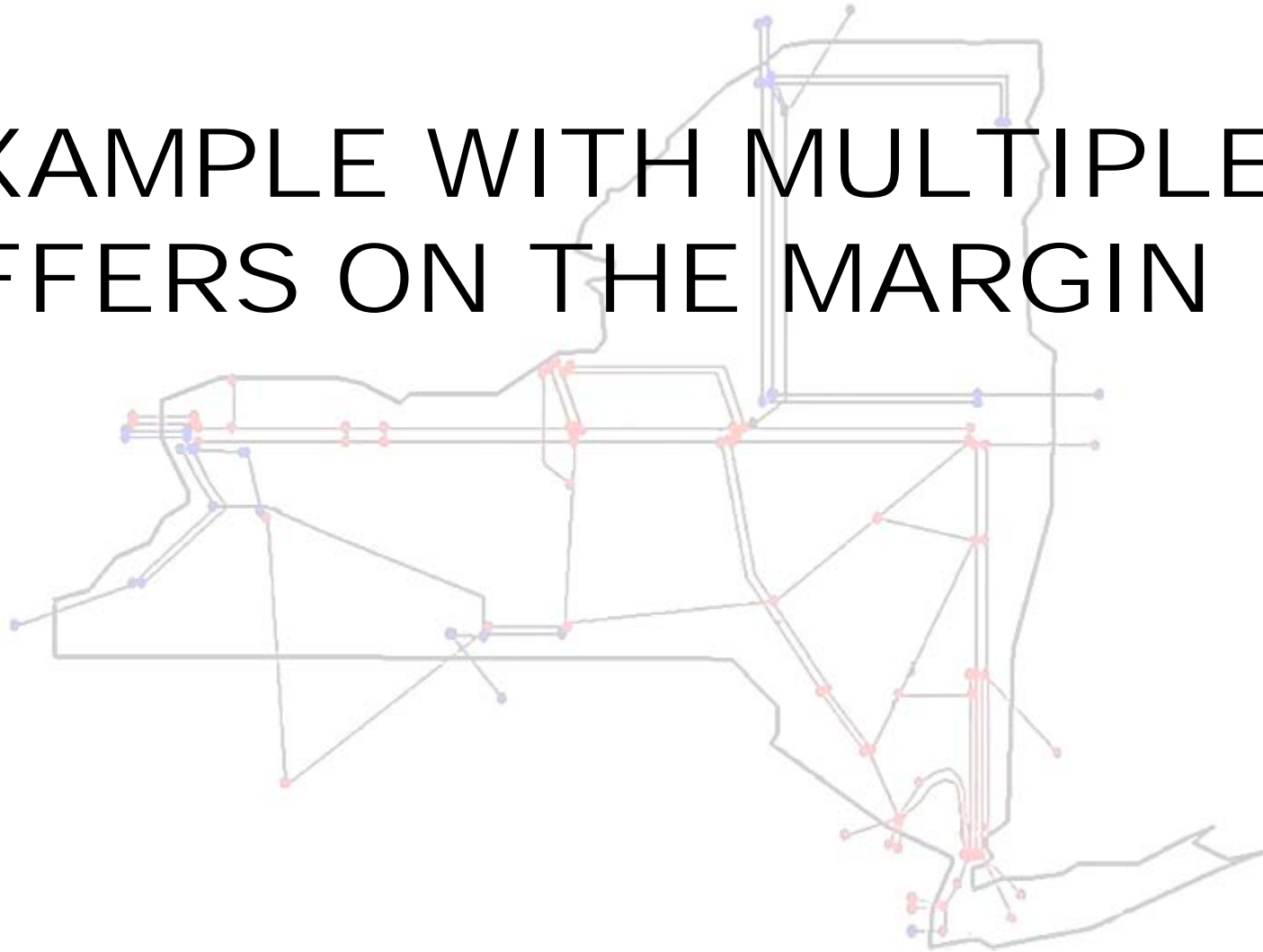
- *The CTS Transaction purchased energy at an average of \$20/MWh in PJM.*
 - PJM first 5 minute RT LMP price of \$15/MWh.
 - PJM second 5 minute RT LMP of \$20/MWh
 - PJM third 5 minute RT LMP of \$25/MWh.
 - **Average PJM price: $(\$15+\$20+\$25)/3= \20**

Example with Timeline (8)

- ◆ **Income Statement (continued):**
 - *The CTS Transaction was paid an average of \$24/MWh in NY.*
 - NYISO first 5 minute settlement price of \$24/MWh.
 - NYISO second 5 minute settlement price of \$19/MWh.
 - NYISO third 5 minute settlement price for of \$29/MWh.
 - **Average NY price: $(\$24+\$19+\$29)/3=\24**

 - *The final price difference was \$4/MWh.*
 - PJM Final Price= \$20
 - NY Final Price= \$24

EXAMPLE WITH MULTIPLE OFFERS ON THE MARGIN



Example with Timeline

◆ Before T-75:

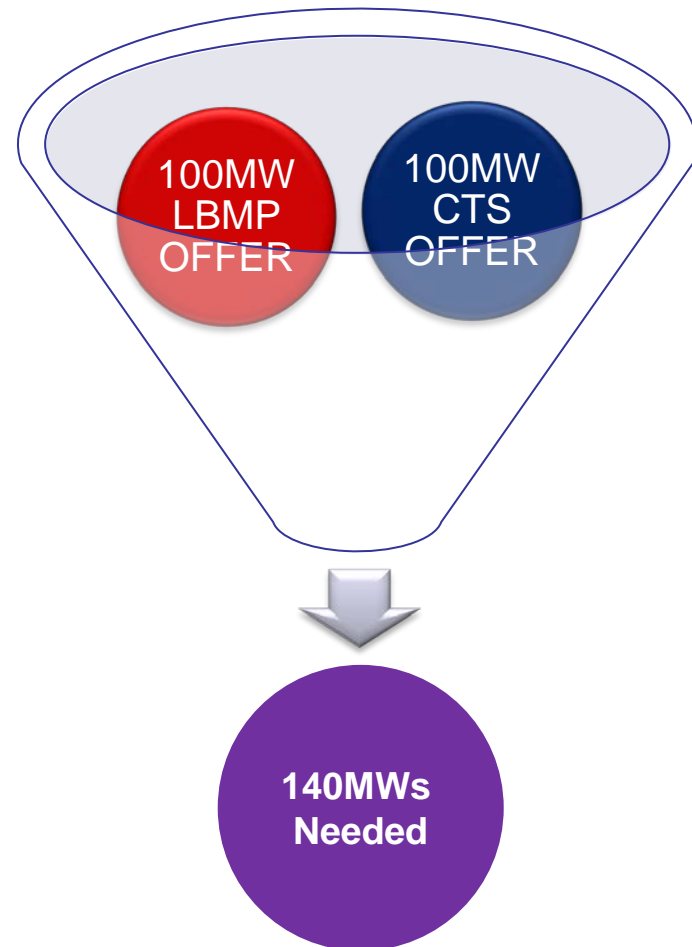
- *Marketers request transmission, and ramp from PJM,*
- *PJM approves transmission reservation, ramp and eTags*
- *In the NYISO MIS one marketer enters a 100MW import (from PJM to NY) CTS Transaction bid of \$6/MWh for the first fifteen minutes of hour T,*
- *Another marketer enters a 100MW import (from PJM to NY) LBMP Transaction bid of \$23/MWh for the first fifteen minutes of hour T*
- *The marketers also enter import CTS and LBMP Transaction bids for the other three intervals in hour T*

Example with Timeline (2)

- ◆ **T-75:**
 - *NYISO locks bids, removes bids with no eTags and curtails to zero eTags with no bids*
 - *Marketers' eTags requests after this point for hour T will not be approved.*
- ◆ **T-60:**
 - *NYISO RTC sends schedules to PJM's IT SCED ("PJM")*
- ◆ **T-40:**
 - *PJM sends prices for T to RTC:*
 - **PJM projects an Interval 2 price of \$17/MWh**

Example with Timeline (3)

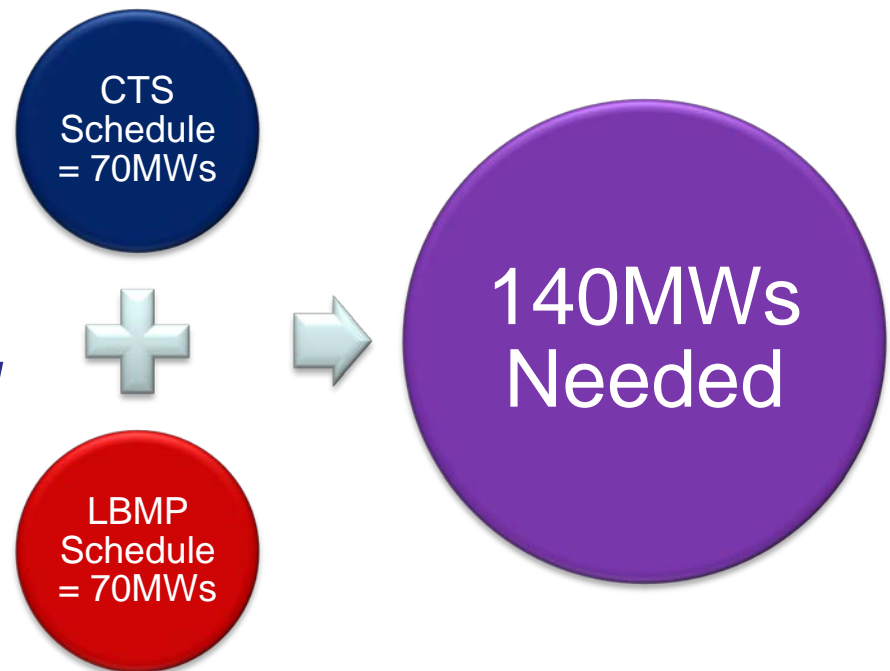
- ◆ **T-30 to T-15:**
 - *Rolling RTC evaluates and posts, CTS and LBMP import schedules are established for first fifteen minutes of hour T,*
 - *The NYISO RTC projects prices of \$23/MWh for the first interval of hour T, based on needing 140MW of PJM to NY imports to economically meet its load.*



Example with Timeline

- ◆ **T-30 to T-15:**

- **CTS Bid:** Since PJM's price projection was \$17/MWh and RTC's projected price is \$23/MWh, the CTS Transaction is marginally scheduled to 70MW ($\$17/\text{MWh} + \$6/\text{MWh} = \$23/\text{MWh} = \$23/\text{MWh}$).
- **LBMP Bid:** Since RTC's projected price is \$23/MWh, the LBMP Transaction is also marginally scheduled to 70MW



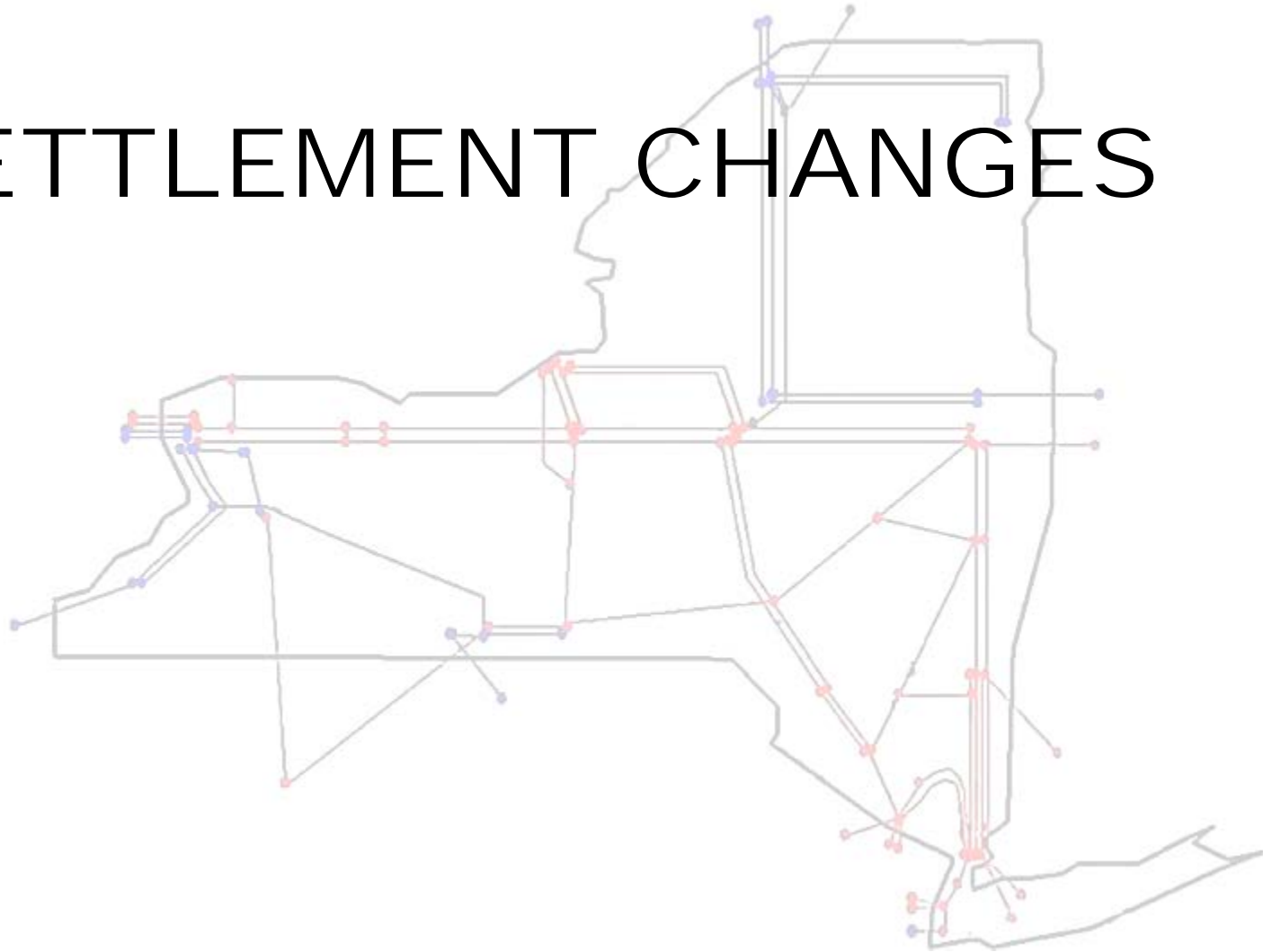
UPLOAD/DOWNLOAD



Upload/Download Template Impacts

- ◆ **All external transaction bids will continue to leverage a single set of upload/download templates**
- ◆ **Changes are required to the following templates:**
 - *Submit Bid; EXT_TRAN_BID*
 - *Download Bids and Schedules; EXT_TRAN_SCH*
- ◆ **For details regarding changes to these templates see (from 7/7/14 MIWG):**
 - ◆ http://www.nyiso.com/public/webdocs/markets_operations/committees/bic_miwg/meeting_materials/2014-07-07/JESS%20Templates_MIWG_2014-07-07_final.pdf

SETTLEMENT CHANGES

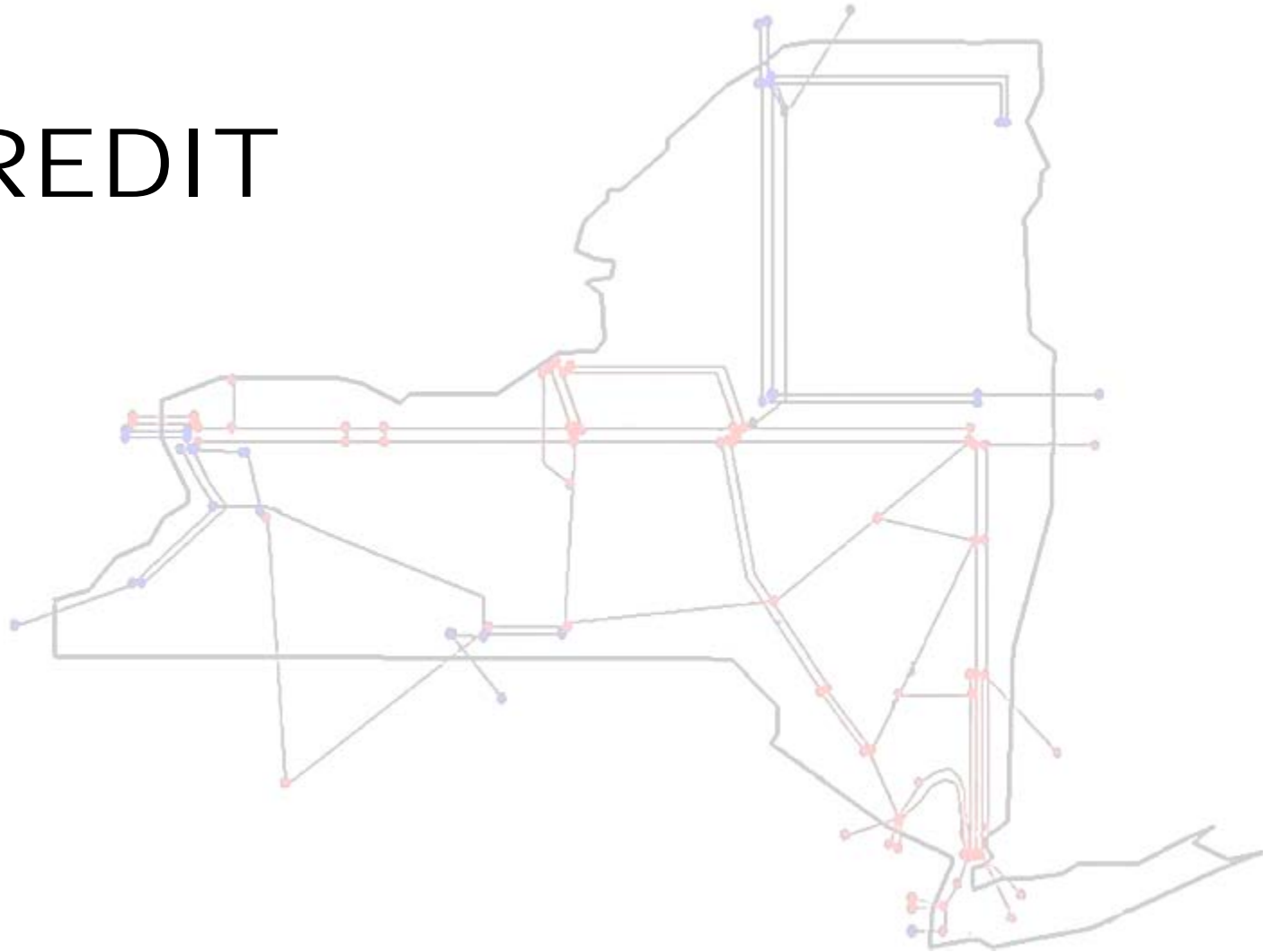


Bid Guarantees/Make Whole Payments

- ◆ **NYISO will not provide Import Curtailment Guarantees for Real-Time CTS (both bilateral and LBMP) transactions and LMBP transactions with PJM (*i.e.*, at CTS-enabled proxies)**

- ◆ **Note that RT Bid Production Guarantees (RT BPCG) were eliminated at all proxies earlier this year.**

CREDIT



- ◆ **Credit policy for CTS Bids developed at CPWG**
- ◆ **Upon submission of a CTS Bid to Export....**
 - *Bids will not be evaluated for credit.*
- ◆ **At HAM market close of the CTS hour bid....**
 - *Credit exposure will be calculated for each 15-minute interval within the bid hour using the most recently available RTC price for that interval as the price point.*
- ◆ **Upon completion of the bid hour in Real-Time until the net amount owed to the ISO is determined for settled External Transactions...**
 - *Consistent with the existing method of calculating the credit requirement for real-time export bids, CTS Bids will be evaluated using the scheduled MWhs and the Real-Time LBMP price.*

See Market Services Tariff Attachment K

Sandbox Testing

- ◆ Sandbox testing sessions are planned for the following:
 - *September 2 - 4*
 - *September 16 - 18*
 - *September 30 - October 2*
- ◆ All JESS users are urged to participate in Sandbox testing regardless of whether or not they plan to use CTS bids or 15-minute bid curves because these changes will impact all JESS users

Informational Resources:

- ◆ *Joint Energy Scheduling System User's Guide at:*

http://www.nyiso.com/public/markets_operations/documents/manuals_guides/index.jsp

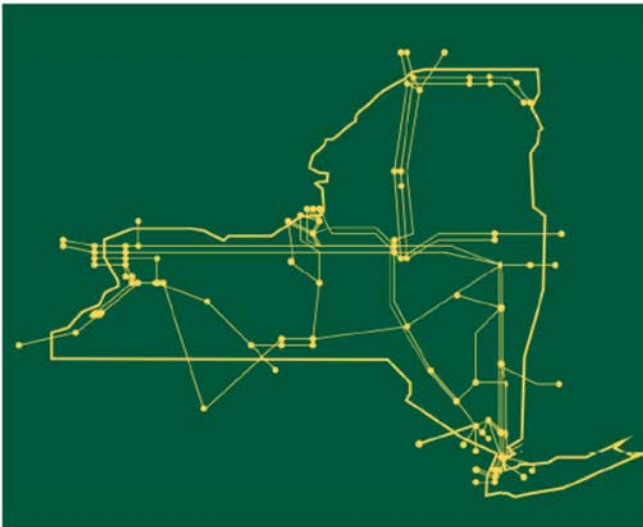
- ◆ *JESS training at (under Miscellaneous):*

http://www.nyiso.com/public/markets_operations/services/market_training/library/index.jsp

Other Informational Resources:

- ◆ **Market Services Tariff (MST) - Section 17**
- ◆ **Open Access Transmission Tariff (OATT) - Attachment J**
- ◆ **Market Participants User's Guide (MPUG) Section 7.6**
- ◆ **Accounting and Billing Manual**
- ◆ **Technical Bulletins**
 - ✓ *#27 – NERC E-tag*
 - ✓ *#58 – External Transaction Scheduling messages*
 - ✓ *#61 – IS+ and RT curtailments*
 - ✓ *#83 – Bidding/scheduling of Multi-Hour Block Transactions*
 - ✓ *#92 – IMO (IESO)-NY Transaction scheduling guidelines*
 - ✓ *#150 – HQTE-NYISO Chateaugay-Massena Interconnection Operation above 1500MW in the RT Market*
 - ✓ *#151 – Import Transactions*
 - ✓ *#158 – Transactions at NY-HQ Interface at Chateaugay*
 - ✓ *#161 – Transactions via Northport-Norwalk (1385) Line*
 - ✓ *#176 – Scheduling Transactions via Dennison Line*
 - ✓ *#178 – Bidding & Scheduling Error Messages*
 - ✓ *#223 – Scheduling Transactions at Proxy Generator Buses Associated with Designated Scheduled Lines*

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.



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