



Intraday Offers Education Impacts to Markets Gateway

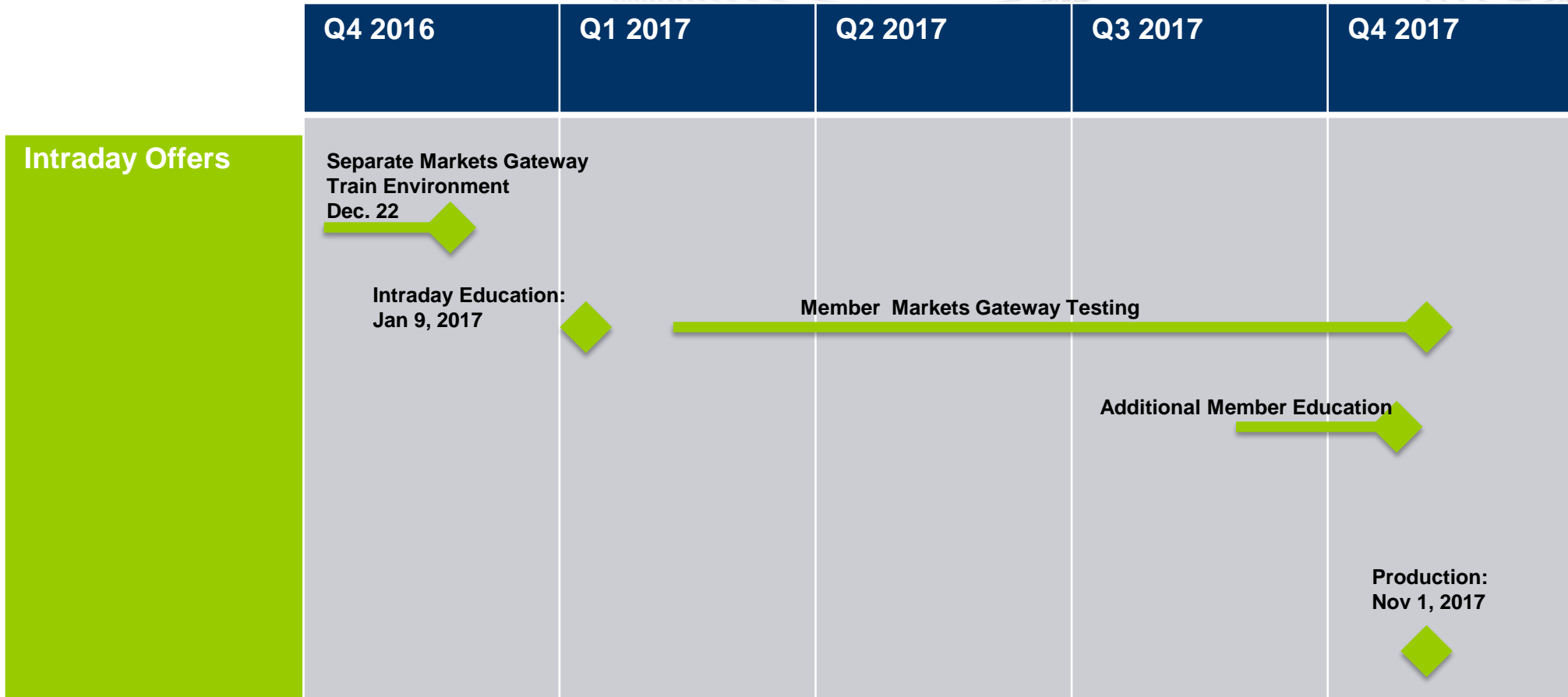
January 9, 2017

- PJM has made all efforts possible to accurately document all information in this presentation. The information seen here does not supersede the PJM Operating Agreement or the PJM Tariff or any pending FERC Filings or Orders.

<http://www.pjm.com/documents/agreements/pjmagreements.aspx>

- The intent of this session is to review a high level overview of Intraday Offers and its impact on Markets Gateway.
 - It is assumed participants have an understanding of the existing offer rules.
 - It is not to debate the business rules of Intraday Offer implementation.
 - It is not meant to cover all aspects of the Intraday Offer implementation.
- Future sessions will be planned closer to the implementation date that cover all affected areas.

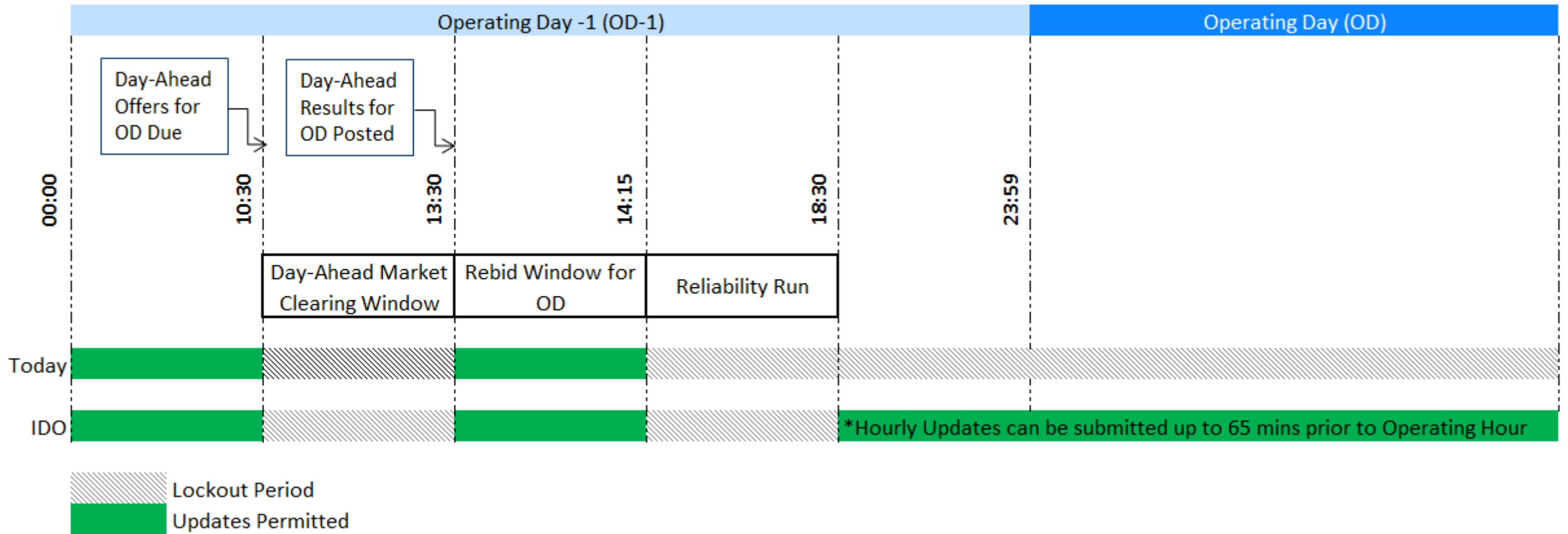
- Introduction of Intraday Offers (IDO) will enable hourly differentiation and modifications for certain parameters of supply offers for
 - Generation Resources
 - Demand Resources
- The current Markets Gateway Screens that allow changing availability of cost schedules intraday will be retired
 - Implemented during the Gas Unit Commitment Coordination (GUCC) effort



Requesting volunteer companies willing to assist with early testing and data creation. Please contact your client manager or email custsvc@pjm.com.

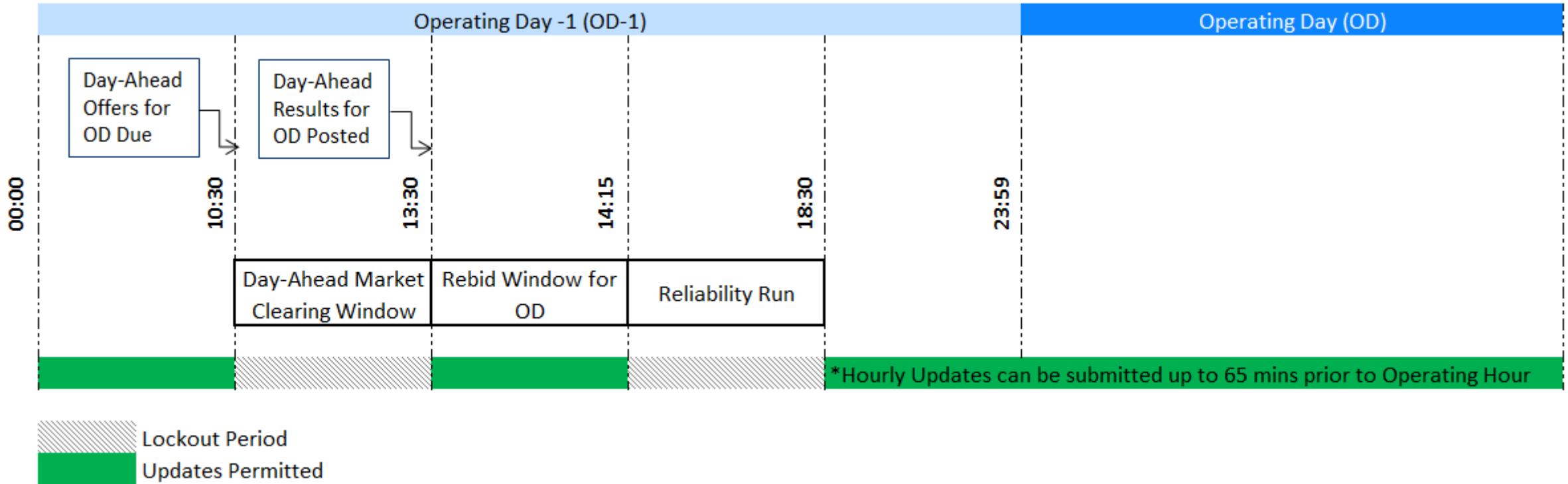
- A separate environment of the Markets Gateway Training environment is available with the Intraday Offer functionality
- A separate user account is not required if the user already has a Markets Gateway Training account
- Markets Gateway Screen changes
 - 4 new screens
 - 5 updated screens
 - 1 screen deleted
- Associated XML is also impacted
 - External Specification Guide is available

Submitting and Updating Offer Timelines



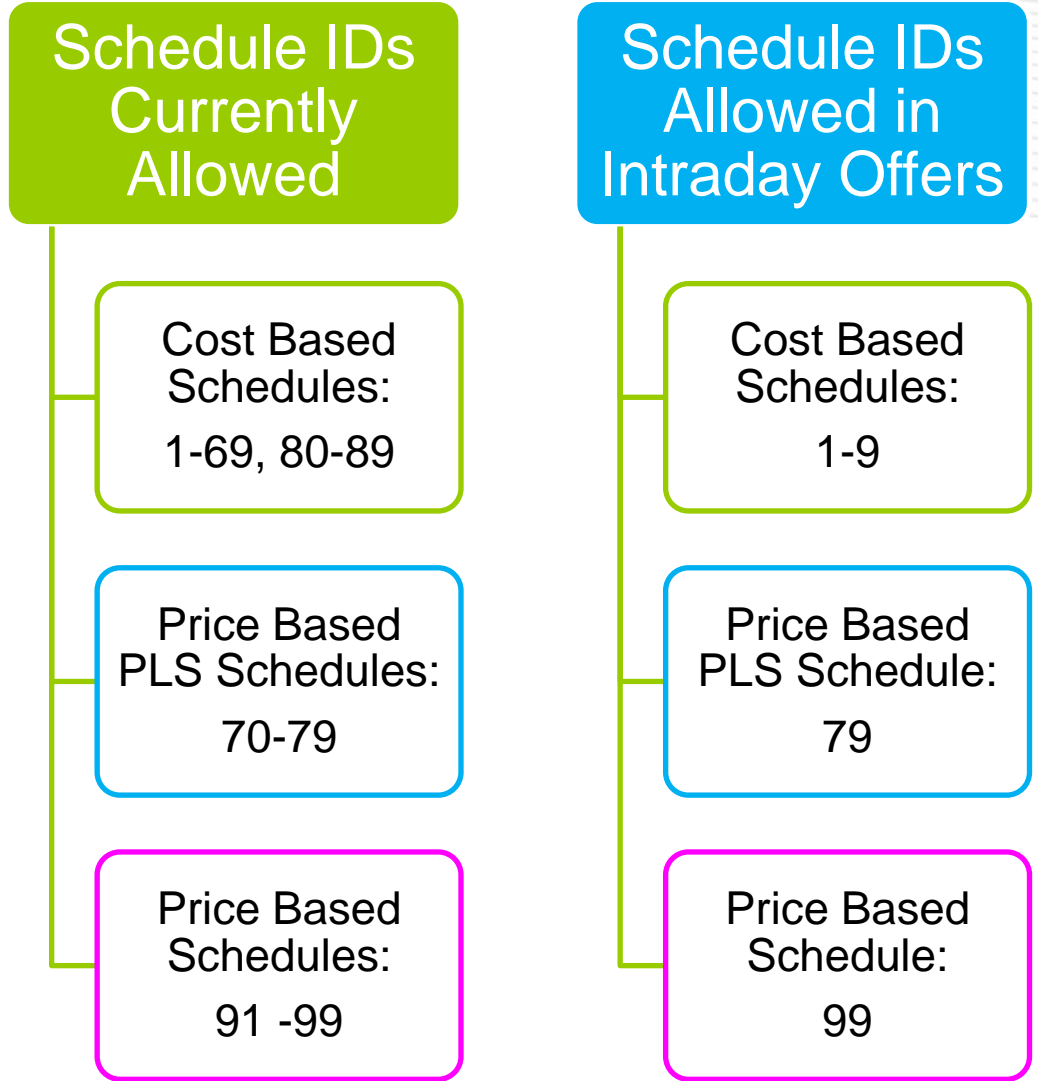
Impacts to Day-Ahead Market Offers

Day-Ahead Offer Period



- Schedule availability will continue to be designated on a daily basis, however will be able to contain offer curves and certain parameters that differ on an hourly basis. Parameters include:
 - No Load Cost
 - Startup Cost (Cold, Intermediate, Hot)
 - ~~Min Run Time~~
 - ~~Notification Time~~
- New screens will be added to Markets Gateway to support the hourly differentiated values
 - Offers Update
 - Detail Update

*corrected post-education session



- The implementation of Intraday Offers will limit the schedule IDs that can be created and used
- Schedules not in the new list will not be able to be made available in Markets Gateway
- Members are urged to begin using the IDO schedule IDs at their earliest convenience to minimize the impact at time of implementation

- Today schedules can be assigned a Market Type
 - Day Ahead
 - Balancing
 - Both
- With the Intraday Offers Implementation, this Market Type field will be removed from the Schedule Detail and Schedule Selection screens and XML Specification Guide
 - Any participant XML submissions will need to remove the parameter

pjm Markets Gateway

- Bilaterals
- Con Edison
- Demand
- ▶ Demand Response
- ▼ Generator
 - Unit
 - Schedules
 - Dispatch Lambda
 - Market Results
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- Interface Pricing
- Opportunity Cost Calculator
- Parameter Limits
- Price Responsive Demand
- ▶ Public
- System Utilities
- Up-To-Transaction
- Virtual
- Weather Forecast

Market Day

Portfolio

Location

Schedule

[Refresh](#)

[Save](#)

Offers
Offer Updates
Detail
Detail Updates
Manager
Selection
Restriction Information

PJMST >> 2017-01-16 >> GENERATOR 1 (98000001) >> Cost (1) Last Updated Date/Time: 2017-01-11 12:20:01

	Hour	MW	Price
▼ <input type="checkbox"/>	1		
▼ <input type="checkbox"/>	2		
		10.0	20.00
		20.0	25.00
		30.0	30.00
▼ <input checked="" type="checkbox"/>	4		
▼ <input type="checkbox"/>	5		
▼ <input type="checkbox"/>	6		
▼ <input type="checkbox"/>	7		
▼ <input type="checkbox"/>	8		
▼ <input type="checkbox"/>	9		
▼ <input type="checkbox"/>	10		
▼ <input type="checkbox"/>	11		
▼ <input type="checkbox"/>	12		
▼ <input type="checkbox"/>	13		
▼ <input type="checkbox"/>	14		
▼ <input type="checkbox"/>	15		
▼ <input type="checkbox"/>	16		

Collapse All
 Expand All
Add Segment

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- Right click on the hour to “Add Segment”
- Can add hourly offer curves for one, some or all hours.
- If an hour is not populated, will default to use the daily curve

Markets Gateway

Refresh
Save

Market Day Portfolio Location Schedule

Offers | Offer Updates | Detail | Detail Updates | Manager | Selection | Restriction Information

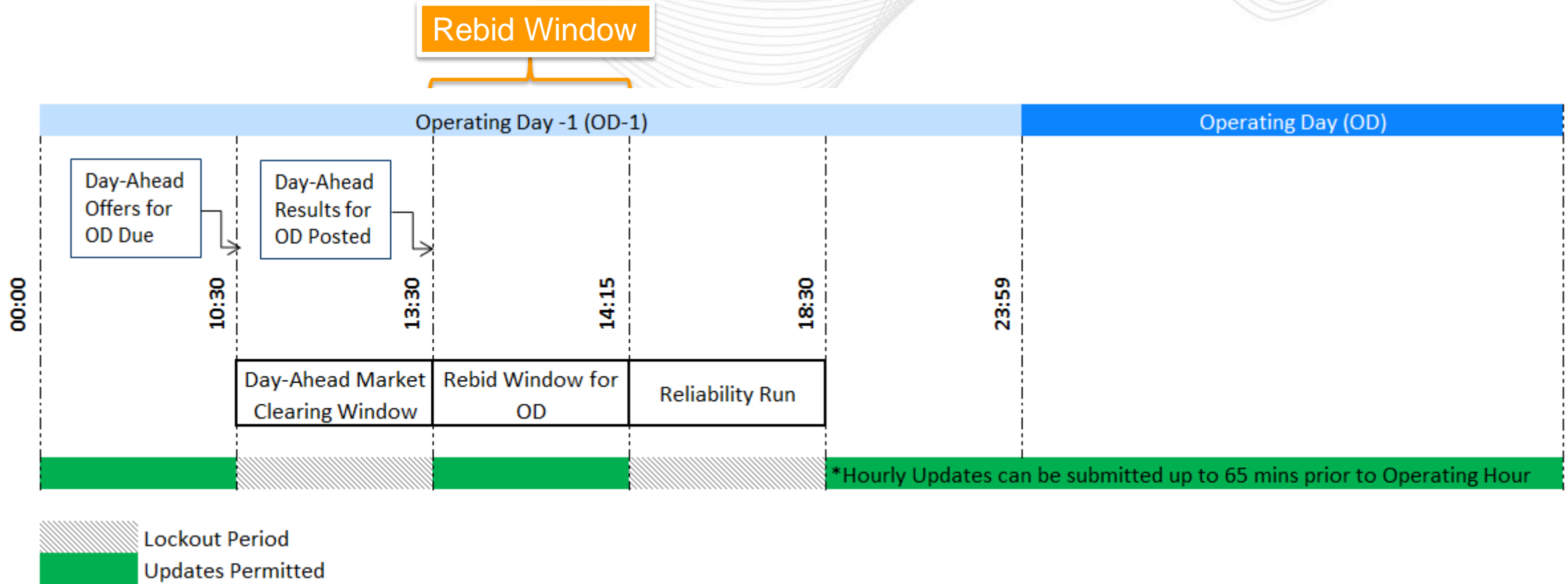
PJMTST >> 2017-01-16 >> GENERATOR 1 (98000001) >> Cost (1)

Last Updated Date/Time: No Update

Switch To Cost Schedule Start Hour

	Hour	No Load Cost	Cold Startup Cost	Intermediate Startup Cost	Hot Startup Cost	Minimum Runtime	Notification Time	Status
<input type="checkbox"/>	1							Not Committed
<input type="checkbox"/>	2							Not Committed
<input type="checkbox"/>	3							Not Committed
<input type="checkbox"/>	4							Not Committed
<input type="checkbox"/>	5							Not Committed
<input type="checkbox"/>	6							Not Committed
<input type="checkbox"/>	7							Not Committed
<input type="checkbox"/>	8							Not Committed
<input type="checkbox"/>	9							Not Committed
<input type="checkbox"/>	10							Not Committed
<input type="checkbox"/>	11							Not Committed
<input type="checkbox"/>	12							Not Committed
<input type="checkbox"/>	13							Not Committed
<input type="checkbox"/>	14							Not Committed
<input type="checkbox"/>	15							Not Committed
<input type="checkbox"/>	16							Not Committed
<input type="checkbox"/>	17							Not Committed

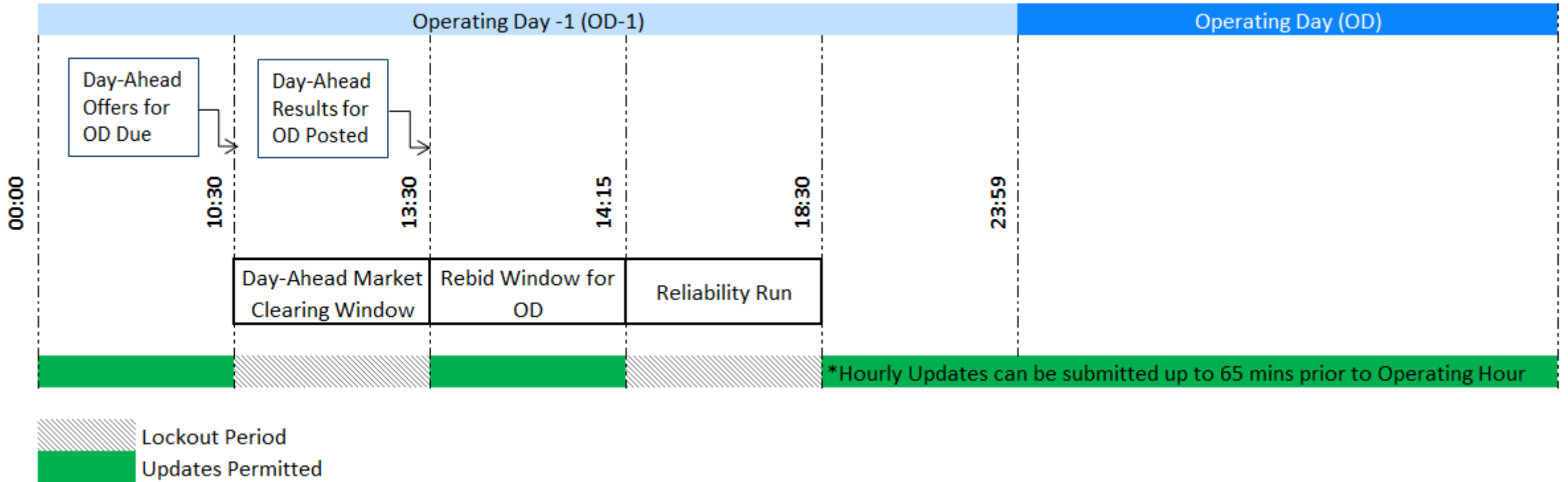
Updates to Offers during Rebid Period



	Today	IDO Implementation
Committed Day-Ahead	No updates to Offer MW or Price permitted for entire day	<ul style="list-style-type: none"> No updates to Offer MW for committed hours Updates permitted to offer price for all hours (price schedule offer price cannot be increased for an hour that is committed)
Not Committed Day-Ahead	Offer MW and Price may be updated prior 1415 (the start of the Reliability Assessment)	<ul style="list-style-type: none"> Offer MW is editable (through end of Rebid period) Updates permitted to offer price for all hours

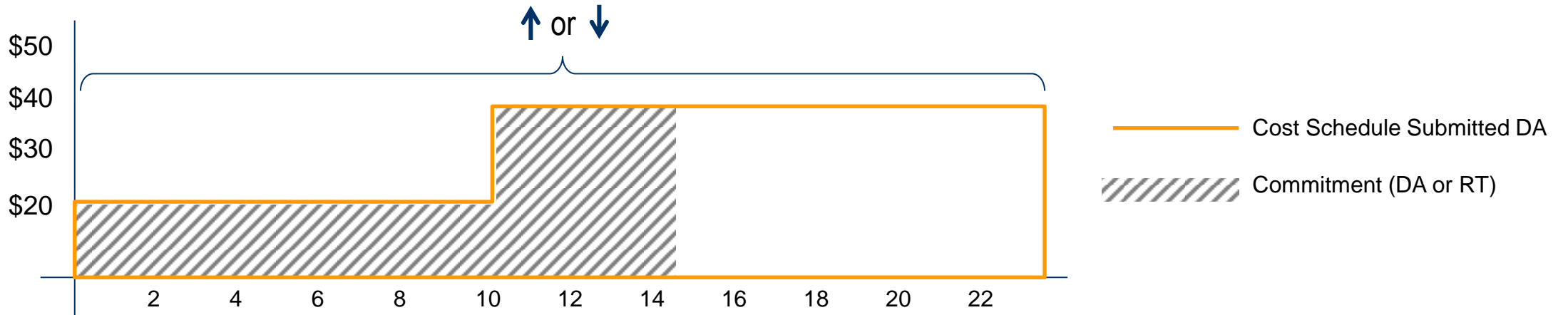
Updates to Offers in Real Time

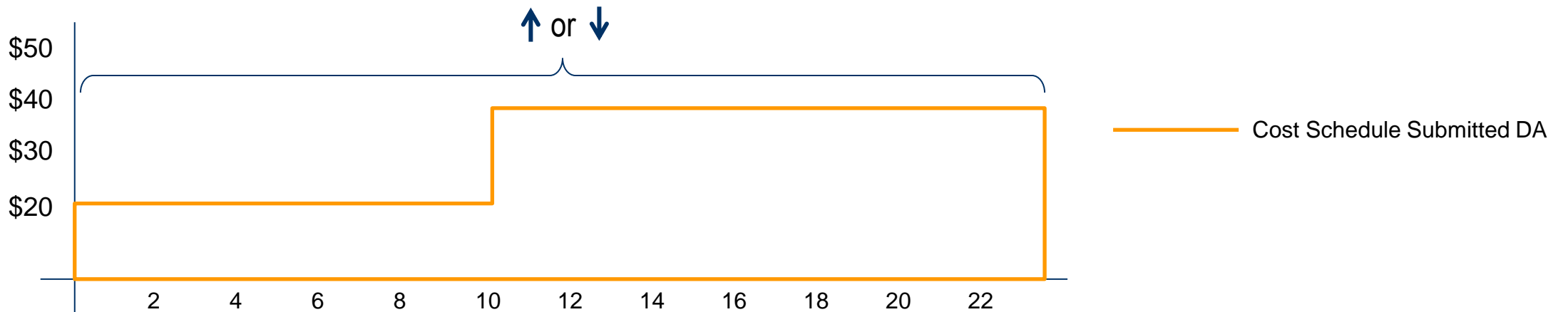
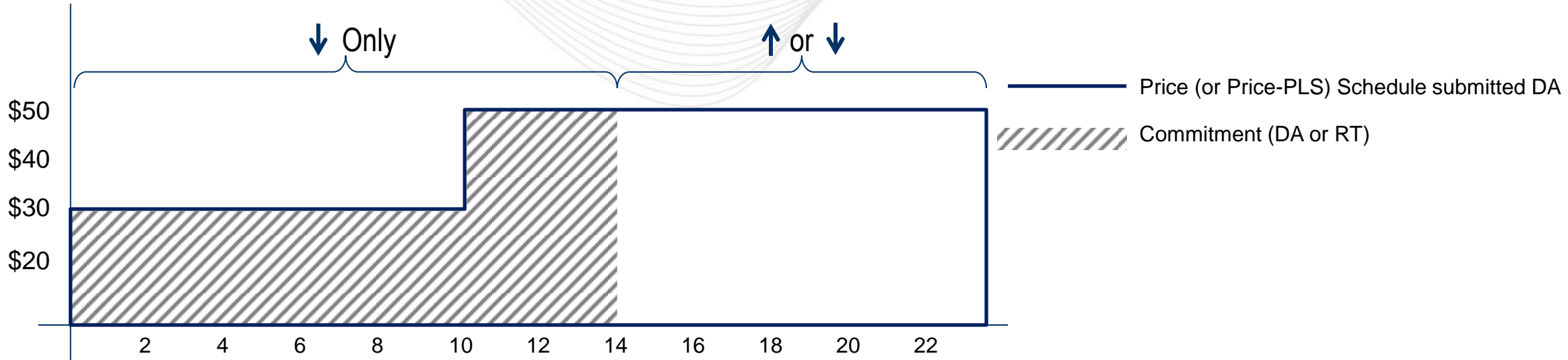
Intraday Offer Period



- Generation offers can be updated after the Reliability Run is complete, starting at 18:30 up to 65 minutes prior to operating hour
- Potential Updates to Offers include:
 - Price component of the Offer Segment
 - No load and Startup Costs
 - Notification Time
 - Min Run Time
 - Switch to Cost Schedule

Type of Unit	Type of Schedule	Committed Hours	Uncommitted Hours
Cost-Based	Price	N/A	N/A
	Cost	Increase/Decrease	Increase/Decrease
Price-Based	Price	Decrease	Increase/Decrease
	Cost	Increase/Decrease	Increase/Decrease







Real Time Updates to No Load and Startup Costs

- No load cost and startup costs (cold, intermediate, hot) can be updated hourly via the Detail Updates Screen based on the following rules:

Startup/No load Election	Type of Schedule	Current Updates Permitted	Future Updates Permitted
Cost-Based Startup	Cost or Price	Updated Daily on Schedule Detail Screen	Increase/Decrease hourly except for lockout period
Price-Based Startup	Cost	Updated Daily on Schedule Detail Screen	Increase/Decrease hourly except for lockout period
	Price	Specified biannually on Unit Detail screen	No change to current functionality

- Notification Time and Min Run Time:
 - May be updated hourly starting 7 days in advance, up to 65 minutes before the start of the target hour (excluding lockout periods)
 - Updates are used in Reliability Run and Real Time only
 - Min Run Time cannot be updated for committed hours
 - Updates made via the Detail Updates Screen
 - Notification Time will be removed from the Hourly Updates screen

- If a unit is committed on a price schedule and its cost schedule incremental energy offer subsequently exceeds its price schedule value, it may elect to be switched to its cost schedule
 - Unit will be switched to use the cheapest available cost schedule
 - The unit must then stay on its cost schedule for the rest of the Operating Day
 - The price schedule will become unavailable and will not be permitted to be made available again for the rest of the Operating Day

Today (GUCC)

- Elected on “Availability Update” screen
- Elect between 18³⁰ and 2100 the day before
- Election does not propagate to subsequent market days

Intraday Offer Implementation

- Elected on “Detail Updates” Screen
- Elect between 18³⁰ the day before and 65 minutes prior to operating hour
- Election does not propagate to subsequent market days

*corrected post-education session

Switch to Cost Schedule Option Relocated

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Market Day: 1/16/2017 | Portfolio: Generation | Location: GENERATOR 1 | Schedule: Cost

Refresh | Save

Offers | Offer Updates | Detail | **Detail Updates** | Manager | Selection | Restriction Information

PJMTST >> 2017-01-16 >> GENERATOR 1 (98000001) >> Cost (1)

Switch To Cost Schedule | Start Hour: 1 | Last Updated Date/Time: No Update

<input type="checkbox"/>	Hour	No Load Cost	Cold Startup Cost	Intermediate Startup Cost	Hot Startup Cost	Minimum Runtime	Notification Time	Status
<input type="checkbox"/>	1							Not Committed
<input type="checkbox"/>	2							Not Committed
<input type="checkbox"/>	3							Not Committed
<input type="checkbox"/>	4							Not Committed
<input type="checkbox"/>	5							Not Committed
<input type="checkbox"/>	6							Not Committed
<input type="checkbox"/>	7							Not Committed
<input type="checkbox"/>	8							Not Committed
<input type="checkbox"/>	9							Not Committed
<input type="checkbox"/>	10							Not Committed
<input type="checkbox"/>	11							Not Committed
<input type="checkbox"/>	12							Not Committed
<input type="checkbox"/>	13							Not Committed
<input type="checkbox"/>	14							Not Committed
<input type="checkbox"/>	15							Not Committed
<input type="checkbox"/>	16							Not Committed
<input type="checkbox"/>	17							Not Committed

- The Three Pivotal Supplier (TPS) Test for the Energy Market is a structural market power test to measure the market power of a participant
 - TPS does not apply to Demand Response Resources
 - Test is performed hourly



- Participants will be notified of offer capped units via new screen in Markets Gateway

- Online resources owned by suppliers failing the TPS test will only be offer capped if they are outside of their Day-Ahead commitment (if committed Day-Ahead) or min run time (if committed in Real Time)
- Offer capped resources will remain offer capped until the earlier of:
 - End of the day
 - Unit is released
 - Start of its next pre-existing commitment
 - Applies to units cycled in the Day-Ahead commitment or brought online in Real Time prior to Day-Ahead commitment

- Generators can opt out of Hourly updates on a monthly basis if their Fuel Cost Policy supports it

If a Generator opts out, they may:

- Provide hourly differentiation for their DA offer
- Update the incremental energy offer, min run time, and no load and startup costs during the Rebid period for hours where the unit does not have a Day-Ahead commitment.
- Update schedule based notification time (except during lockout periods)
- Utilize “Switch to Cost” functionality

If a Generator opts out, they may NOT:

- Update incremental energy offer, min run time, no load and start-up costs after the Rebid period

- Users must communicate their desire to opt out or opt back in in the month prior to the month they want to begin opting out
- The option may only be selected/deselected prior to midnight of the 16th day of the current month (end of the 15th day)
- Opt out is generator specific, and continues until the user cancels, by unchecking the box
- There is no XML capability for opt out

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Market Day Portfolio Location

Hourly Updates | Detail | Energy Ramp Rates | Synchronized Reserve Ramp Rates | Wind Forecast | **IntraDay Opt Out**

<input type="checkbox"/>	Month	Opted Out	PJM Override	Notes
<input type="checkbox"/>	October 2016	No	Approved	
<input type="checkbox"/>	November 2016	No	Approved	
<input type="checkbox"/>	December 2016	No	Approved	
<input type="checkbox"/>	January 2017	No	Approved	
<input type="checkbox"/>	February 2017	No	Approved	

The option may only be selected/deselected prior to midnight of the 16th day of the current month (end of the 15th day)

- Schedule Selection Screen
 - “Use Max Gen” will be removed – no longer used
 - “Daily” will be added to No Load Cost, all Start-up Costs
- Hourly Updates Screen
 - “Status” and “Notification Time” will be removed
 - Requires XML Changes
 - Reported on the new Detail Updates screen

- In order to avoid needing several XML templates for different times of the day and different commitment statuses, the system will allow XML submittals to contain locked out parameters and not reject them if the new value is the same as currently in the system

Impacts to Demand Response Resources

- Incremental energy offer price and the shut down cost of a DSR can be updated up to 65 minutes prior to the start of the target hour under the following conditions:

Committed Hours	Uncommitted Hours
Decrease	Increase/Decrease

- Price will be added to the Demand Response > Hourly Updates screen
- New Parameter Updates screen in Markets Gateway will allow hourly values for shut down cost

- Hourly Notification Time and Min Down Time Values:
 - Can be submitted starting 7 days in advance, up to 65 minutes before the start of the target hour (excluding lockout periods)
 - Updates only used in Reliability Run and Real Time
 - Updated via Load Response > Hourly Updates screen
 - Min Down Time cannot be updated for committed hours

Impacts to Ancillary Service Offers

	Today	IDO Implementation	Opt Out of IDO
Offer Price Granularity	Daily	Hourly	Hourly
Offer Price Update Deadline	1415 Day Before	65 minutes prior to Operating Hour	1415 Day Before
Offer MW/Status Granularity	Hourly	Hourly	Hourly
Offer MW/Status Update Deadline	61 minutes prior to Operating Hour	65 minutes prior to Operating Hour	65 minutes prior to Operating Hour

*corrected post-education session



Impact to Generation Synchronized Reserve Offers



	Today	IDO Implementation	Opt Out of IDO
Offer Price Granularity	Daily	Hourly	Hourly
Offer Price Update Deadline	1415 Day Before	65 minutes prior to Operating Hour	1415 Day Before
Offer MW Granularity	Hourly	No Change	No Change
Offer MW Update Deadline	2 hours prior to Operating Hour	65 minutes prior to Operating Hour	65 minutes prior to Operating Hour
Hourly Availability Update Deadline	61 minutes prior to Operating Hour	65 minutes prior to Operating Hour	65 minutes prior to Operating Hour

*corrected post-education session

Synchronized Reserve Offer Updates to Markets Gateway


- Bilaterals
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 - Unit
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 - Regulation Market
 - Synchronized Reserve Mar
 - Day-Ahead Scheduling Res
 - Interface Pricing
 - Opportunity Cost Calculator
 - Parameter Limits
 - Price Responsive Demand
- ▶ Public
 - System Utilities
 - Up-To-Transaction
 - Virtual
 - Weather Forecast

Market Day
Portfolio
Location

Refresh 
Save 

Offers Updates

	Location	Offer MW	Offer Price	Condense Energy Use	Condense Startup Cost	Condense To Generate Cost	Full Heat Rate	Reduced Heat Rate	Variable Operating & Maintenance Expense Rate	Spin As Condenser	Condense Available Status
<input type="checkbox"/>	GENERATOR 1									No	Not Available





Impact to Demand Response Synchronized Reserve Offers

	Today	IDO Implementation
Offer Price Granularity	Daily	Hourly
Offer Price Update Deadline	1415 Day Before	65 minutes prior to Operating Hour
Offer MW Granularity	Hourly	No Change
Offer MW Update Deadline	3 hours prior to Operating Hour	65 minutes prior to Operating Hour

*corrected post-education session

- Any updates to the functionality discussed in this session will be communicated at Tech Change Forum
- Additional education sessions will be scheduled closer to the implementation dates and communicated via:
 - MIC
 - Markets Gateway User Distribution List
 - Technotify
 - Demand Response Subcommittee

- Additional Materials are available on the [Markets Gateway Tools Page](#)
 - [Updated External Specification Guide](#)
 - [Intraday Offers Frequently Asked Questions Document](#)
 - Accessing the IDO Training Environment
 - Market Rule Changes
 - XML/Browserless Information & Examples
- Questions?
 - Member Support Hotline at 610-666-8980 or 866-400-8980, or at custsvc@pjm.com