Working to Perfect the Flow of Energy

PJM ExSchedule User Guide

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Prepared by

Transmission Service Department

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PJM User Guide:

ExSchedule

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Current Revision

Revision 11 (11/05/2021)

- Various minor edits for clarity

Introduction

In this Introduction, you will find the following information:

- What you can expect from the PJM Manuals in general (see “About PJM Manuals”).
- What you can expect from this PJM User Guide (see “About This User Guide”).
- How to use this User Guide (see “Using This User Guide”).

About This User Guide

The **PJM User Guide for ExSchedule** is a non-governed document that focuses on the PJM Internet application, called “ExSchedule”.

This guide is intended to illustrate the mechanics of using the ExSchedule application; however, it is not a substitute for an Interchange Scheduling manual. The language and rules in this document are superseded by the PJM Regional Transmission and Energy Scheduling Practices document.

The intended audiences for the **PJM User Guide for PJM ExSchedule** are:

- PJM Market Participants – engaged in the submission of Interchange Schedules
- PJM Market Settlements – engaged in summarization and billing of participants’ Interchange Schedules

References

The references to other documents that provide background or additional detail directly related to the PJM User Guide for **PJM ExSchedule** are:

- PJM Regional Transmission and Energy Scheduling Practices
- PJM Command Line Interface Document

Section 1: PJM ExSchedule

ExSchedule is an Internet application that facilitates the interchange of bulk power between the PJM and its neighbors by enabling users to create and review Interchange Schedules.

1.1 ExSchedule Overview

ExSchedule is an Internet application that facilitates the interchange of bulk power between PJM and other Balancing Authorities by enabling Market Participants to request, evaluate and confirm their schedules. Market Participants may submit both Real-time Interchange Schedules and Day-ahead Bids via ExSchedule.

1.2 Definitions, Acronyms, and Abbreviations

Acronym	Definition
BA	Balancing Authority
CAM	Company Account Manager Company Account Managers permit companies to manage their PJM user accounts and access rights on a tool-by-tool basis. It provides a means for members to ensure that only the users they authorize have access to their data.
CLI	Command Line Interface
CTS	Coordinated Transaction Scheduling
EIR	Electric Industry Registry
FRP	Financially Responsible Party
Market Type	Real-time or Day-ahead
NAESB	North American Energy Standards Board
OATT	PJM's Open Access Transmission Tariff
PSE	Purchasing-Selling Entity

Acronym	Definition
Ramp	The change in MW between consecutive 15 minute scheduling intervals. PJM's ramp limits can be found in the Regional Transmission and Energy Scheduling Practices document.
Ramp Reservation	A submission by the user via the User Interface (UI), the Command Line Interface (CLI), or a Tag, to reserve and hold a portion of available ramp capability. In order for a manually-reserved Ramp Reservation to become an Interchange Schedule, the Ramp Reservation must be attached to a Tag prior to its expiration. PJM's Ramp Reservation timing requirements can be found in the Regional Transmission and Energy Scheduling Practices document.
Regional Practices	Abbreviation of the PJM Regional Transmission and Energy Scheduling Practices document
Transaction Type	Fixed or Dispatchable
UI	ExSchedule User Interface

1.3 ExSchedule Functions

ExSchedule is built around the following basic functions:

Function	Description
Reserve Ramp	Used to create and modify Ramp Reservations and Dispatchable Reservations
CTS	Used to create and modify CTS Bids
Day-ahead Bid	Used to create and modify financial Day-ahead Bids that will be evaluated in PJM's Day-ahead market
Buy OASIS	Used to purchase Transmission Service that can be

Function	Description
	used to support an Interchange Schedule
View Ramp	Used to view ramp availability
View Queued Ramp Reservations	Used to view queued Ramp Reservations
FRP Approval	Used to approve/deny Tags that have been submitted by another entity on a Market participant's behalf
Reports	Used to view and download reports
Schedule Summary	Used by select users to view Interchange Schedules between PJM and a neighboring BA. This function is not available to Market Participants.
CLI	Used to upload/download Ramp Reservations, CTS Bids, Day-ahead Bids, and reports without logging into the ExSchedule UI

1.4 Application Access Requirements

In order to use the ExSchedule application, users must possess a PJM user account that has been granted the appropriate privileges by their company's authorized CAM. The available ExSchedule user privileges are:

- ExSchedule Read Only
- ExSchedule Read/Write
    - Read/write access will only be granted to a company if that company also holds OASIS Read/Write access

ExSchedule Read/Write access is also dependent on a link to the NAESB Electric Industry Registry (EIR). Each company must register a PSE code (also necessary for the submission of Tags) and request a mapping of that code to their PJM account. The EIR can be reached via this link: OATI webRegistry.

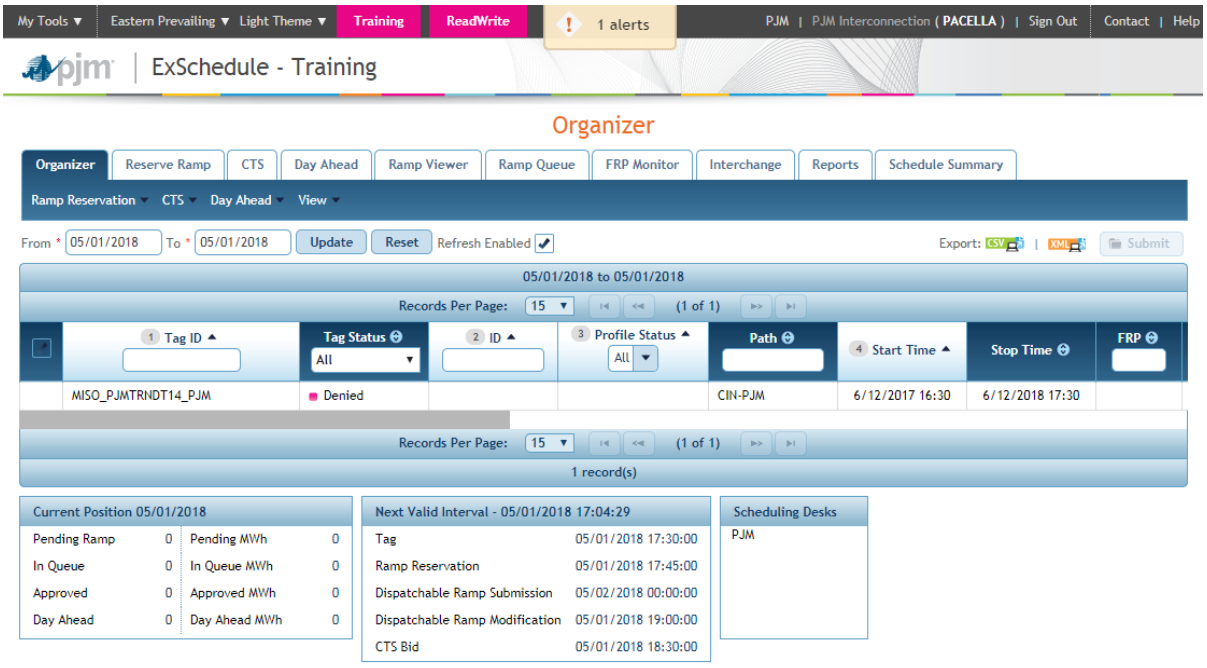
Once a PSE code has been obtained, the user may log in to ExSchedule and submit the code via the in-application request form located on the ExSchedule Organizer under the Request Forms menu (NAESB EIR Mapping Request). ExSchedule functionality will be degraded until the PJM account and PSE code are formally linked by a PJM administrator.

1.5 Scheduling Rules and Guidelines

Refer to the PJM Regional Transmission and Energy Scheduling Practices document for a list of business rules and guidelines to follow when creating Ramp Reservations, CTS Bids, and Day-ahead Bids.

1.6 Organizer

The default first screen in ExSchedule is the Organizer. The Organizer can be used to view all Ramp Reservations, Tags, CTS Bids, and Day-ahead Bids that belong to the user's company. The Organizer also provides summary information about the current date, which is presented through the Current Position and Status Panel areas near the bottom of the screen.

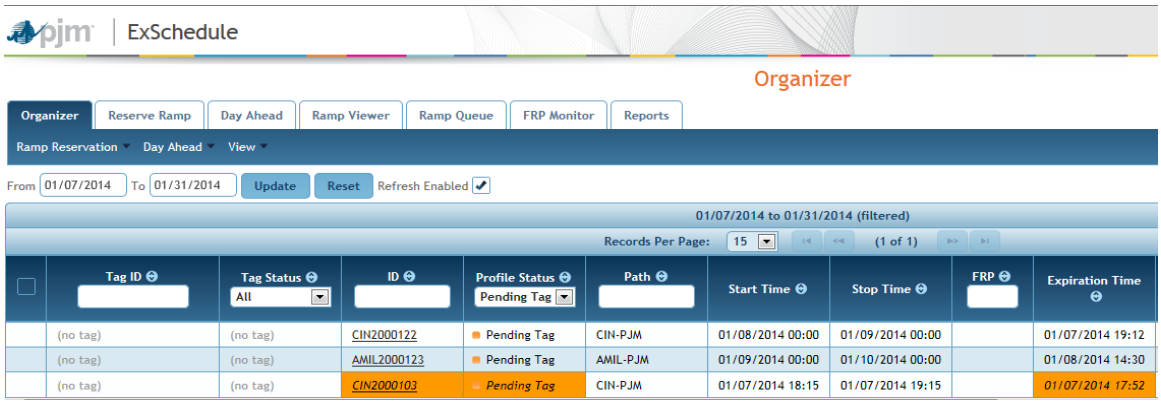


1.6.1 Organizer Features

The following features have been implemented to assist ExSchedule users in viewing and managing their Interchange Schedule data.

Feature	Description

Feature	Description
Time Zone Selection	Users may select a time zone that globally changes times and dates across the ExSchedule application.
Company and User	ExSchedule displays both the user's company and username in the upper right hand corner.
Help	Navigates to the ExSchedule eTools webpage, where this user guide and user videos may be found.
User Notifications	ExSchedule will display notifications to users when a significant event has occurred, such as the extension of the ExSchedule Day-ahead Bid submission deadline.
Auto-Refresh	The "Refresh Enabled" checkbox will set the Organizer to auto-refresh on a 60-second interval.
Export CSV	Exports Organizer data in CSV format
Export XML	Exports Organizer data in XML format
Ramp Reservation Expiration Notification	ExSchedule will flag Ramp Reservations that are within 5 minutes of expiring to appear in orange on the Organizer screen. (see screenshot below)



1.6.2 Managing Organizer Data

As the Organizer displays data submitted by all users belonging to a single company, a variety of tools are available to help users selectively display the data that matters to them.

Date Range:

- Specify a From and To date to request data effective during the date range. The data will be retrieved when the user clicks the "*Update*" button. The default date range is 1 day. The maximum date range is 31 days.

Column Sorting:

- Sort the data in the Organizer by clicking on a column header. The sort order will toggle between ascending and descending with each click. A secondary and tertiary sort can be created by holding the CTRL key and clicking on additional columns.

Column Filtering:

- *Dropdown List*
  Filter the data displayed in certain columns by clicking on the dropdown arrow located in the text box below the column header and choosing a filter.
- *Free Text*
  Filter the data displayed in certain columns by entering a search string in the text box.

Column Reordering:

- Reorder the columns from their default position by clicking the column header and dragging it to the desired location in the Organizer

Reset to Defaults:

- Click the *"Reset" Button* to clear all sorting and filters on the displayed columns. The Date Range and Column Order will not be reset until the user logs out of ExSchedule.

Custom Organizer Views

Users may customize and save how data is displayed on the Organizer:

From the *"View"* Menu

- Select Columns
  - Specify the columns that should be displayed
- Save View
  - Save the current Organizer selections for future use, including filters. Once saved, views may not be modified, but additional views can be saved and unwanted views can be deleted.

    A view can be flagged as "Preferred" which will cause the view to become the new default upon logging in to the application.
- Reset to Default

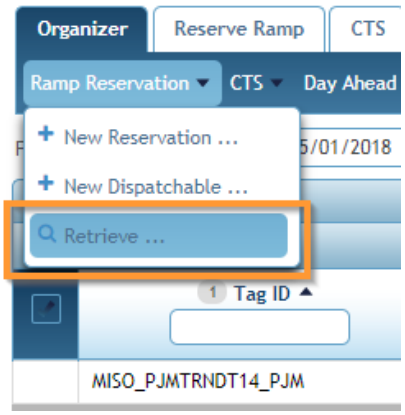
- Clear the current view and reset to the default view. All default columns will be displayed and all filters will be removed.

- Delete Selected Views
  - Delete previously saved views that are no longer needed.
- My Views
  - Display a list of all views saved by the current user.

1.6.3 Retrieve Existing Ramp Reservations, CTS Bids, and Day-ahead Bids

From the “Ramp Reservation”, “CTS”, or “Day Ahead” menus

- Click Retrieve
  - A new dialogue box will prompt the user for either a Ramp Reservation, CTS Bid, or Day-ahead Bid ID, depending on the menu. The user will be transitioned to the appropriate screen and the display will populate with the requested data.



From the ID column of the Organizer

- The ID value is a hyperlink to more detailed information. Click this link to navigate to the Reserve Ramp, CTS, or Day Ahead screens.

1.6.4 Organizer Column Definitions

Column Name	Column Description	Ramp Reservation	Day-ahead Bid
Tag ID	This column will populate with the Tag ID for Tags associated with the user's company.	X	
Tag Status	Latest Composite Tag Status	X	
ID	This field will be populated with the Ramp Reservation ID, CTS Bid ID, or the Day-ahead Bid ID	X	X
Profile Status	Latest Status associated to a profile	X	X
Path	Scheduling path	X	X
Start Time	Energy Profile Start Date/Time	X	X
Stop Time	Energy Profile Stop Date/Time	X	X
FRP	Company that is financially responsible	X	
Expiration Time	A timestamp indicating when a Pending Tag Ramp Reservation will expire	X	X
Exception	A special keyword attached to the Tag	X	
Import Pricing	Day-ahead Bid Import Pricing Point		X
Export Pricing	Day-ahead Bid Export Pricing Point		X
Last Updated	Time of the last update	X	X
Queued	Time the Ramp Reservation was queued	X	X
Update User	User who last updated the record	X	X
Type	CTS, Fixed, or Dispatchable	X	X
Market	Real-time or Day-ahead	X	X
Outside Name	Users can attach a custom label to their Ramp Reservation	X	
Outside ID	Users can attach a custom reference ID to their Ramp Reservation.	X	

1.6.5 Organizer Dashboard Data

The following three dashboards provide users with additional information that may assist in providing a more comprehensive overview of their data. All displayed results are computed based on the current system date.

1.6.5.1 Current Position

Value	Description
Pending Ramp	The number of Ramp Reservations with “Pending Tag” status on the indicated date
In Queue	The number of Ramp Reservations with “In Queue” status on the indicated date
Approved	The number of Ramp Reservations with “Approved” status on the indicated date.
Day-ahead	The number of Day-ahead Bids with “Cleared” status on the indicated date
Pending MWh	The total megawatt hours of Ramp Reservations with “Pending Tag” status on the indicated date
In Queue MWh	The total megawatt hours of Ramp Reservations with “In Queue” status on the indicated date
Approved MWh	The total megawatt hours of Ramp Reservations with “Approved” status on the indicated date
Day-ahead MWh	The total megawatt hours of Day-ahead Bids with “Cleared” status on the indicated date

1.6.5.2 Next Valid Interval Panel

Value	Description
Last Refreshed	In the header of the table, the date and time the Organizer data was last refreshed
Tag	The next valid Tag submission interval (15 minute increments) for which a Tag will be considered “on-time”
Ramp Reservation	The next valid Ramp Reservation submission interval (15 minute increments) for which a Ramp Reservation will be considered “on-time”
Dispatchable Ramp Submission	The next valid Dispatchable Reservation submission interval for which a Dispatchable Reservation will be considered “on-time”
CTS Bid	The next valid CTS Bid submission interval for which a CTS Bid will be considered “on-time”

1.6.5.3 Scheduling Desks

The Scheduling Desks panel displays all NAESB EIR Entity Codes that have been mapped to a company's PJM Organization ID. At least one mapping must exist in order for a company to submit Tags.

See Section 1.4 – Application Access Requirements

1.7 Reserving Ramp

ExSchedule users can create and modify Ramp Reservations as an optional step in the Tag submission process. Ramp Reservation functionality can be accessed via the Reserve Ramp screen.

Ramp Reservations are used to manually secure ramp ahead of Tag submission.

1.7.1 Ramp Reservation Data Definitions

Column Name	Column Description	System Generated	Required	Optional
Ramp Res ID	This will be the unique identifier for the Ramp Reservation. It will be formed by the combination of either the scheduling interface acronym (for imports and exports) or "WPJM" (for wheels) followed by a numerical ID generated by ExSchedule (e.g. WPJM1234, NYIS1234).	X		
NERC Tag ID	This field will be populated with the Tag ID when a Ramp Reservation has been attached to a Tag.	X		
Status	The current Ramp Reservation status.	X		
Owner	The company who owns the Ramp Reservation.	X		
Last Updated Agent	The user who last updated the Ramp Reservation.	X		
Update Timestamp	The timestamp at which the Ramp Reservation was last updated.	X		
Expiration Timestamp	The timestamp at which the Ramp Reservation will expire if not linked to a Tag	X		
In-Queue Timestamp	The timestamp at which the In-Queue Ramp Reservation will	X		

Column Name	Column Description	System Generated	Required	Optional
	expire if there is no available ramp.			
Outside Name	Users can attach a custom label to their Ramp Reservation			X
From Interface	Scheduling interface where the Ramp Reservation will source		X	
To Interface	Scheduling interface where the Ramp Reservation will sink.		X	
Outside ID	Users can attach a custom reference ID to their Ramp Reservation.			X
Comment	Users can add additional information pertaining to the Ramp Reservation.			X

1.7.2 Ramp Reservation Profile Types

An ExSchedule Ramp Reservation is a container that may hold multiple different profiles. A profile is a collection of start/stop/MW energy intervals. At any given time, a Ramp Reservation may contain a minimum of one profile and a maximum of one of each of the profile types listed below.

Profile Type	Description
APPROVED	A Ramp Reservation has been successfully attached to a Tag.
CURTAILED	The Tag associated with the APPROVED profile has been curtailed. The CURTAILED profile overlays the APPROVED profile to reflect the reliability limit in place on the Tag.
DELAYED	Limited to the NYISO scheduling paths. DELAYED profiles are similar to PENDING_TAG profiles, but are not validated against available ramp at the time of submission. DELAYED profiles eventually transition to APPROVED profiles as the NYISO market clearing occurs.
DENIED	A Ramp Reservation that failed data validations at the time of submission.
EXPIRED	A PENDING_TAG/DELAYED/PROPOSED profile not attached to a Tag prior to expiration will be transitioned to EXPIRED.
IN_QUEUE	A Ramp Reservation submitted into the ramp queue. Reservations unable to pass the ramp availability validation at the time of submission can optionally be placed into a queue to be regularly reevaluated for ramp availability.

Profile Type	Description
PENDING_TAG	A Ramp Reservation that has successfully passed all data validations at the time of submission, but which has not yet been attached to a Tag.
WITHDRAWN	A PENDING_TAG/DELAYED/PROPOSED profile that was withdrawn by the user bill be transitioned to WITHDRAWN.
WORKING	This profile captures the changes associated with creating or modifying a Ramp Reservation prior to submission of those changes. WORKING profiles may be saved for further modification at a later date.

1.7.3 Ramp Reservation Data Validations

Ramp Reservation submissions must pass multiple data validations:

1. **Scheduling Path** – the scheduling path must be valid for the entire duration of the Ramp Reservation energy profile
2. **Timing Requirements** – the Ramp Reservation must be submitted sufficiently far in advance of the reservation start time to respect the timing requirements established in the Regional Practices
3. **Ramp Availability** – every MW value change in the energy profile must pass a ramp availability check
4. **Maximum MW** - MW must be an integer and the user-specified value may not exceed a maximum of 1500 MW.
5. **Scheduling Interval** – specified start and stop times must be locked to quarter-hour intervals (xx:00, xx:15, xx:30, or xx:45.)

1.7.4 Create a New Ramp Reservation

Users may create a new Ramp Reservation by clicking New Reservation from the Ramp Reservation menu. The following steps must be completed.

1. Make a selection in both the *From Interface* and *To Interface* dropdown lists in order to establish a scheduling path.
2. Create a reservation energy profile (start, stop, MW)
   a. Specify a start and stop date
   b. Specify a start and stop time.
   c. Specify a MW value.

3. For each completed energy interval, click the Add Energy button located under the MW/Price field(s). The energy profile will be added to the table at the right and to the chart below. The energy profiles will have a WORKING status.
4. Energy intervals in WORKING status may be discarded by clicking on the trash-can icon in the Action column.
5. When all energy profile intervals have been completed, click the Submit button above the energy interval table to validate the reservation.

WORKING profiles submitted using the “Submit” button will receive the following status:

- **PENDING_TAG** – if all data validations are successful
- **DENIED** – if one or more data validations fails

WORKING profiles submitted using the “Queue” button will receive the following status:

- **PENDING_TAG** – if all data validations are successful
- **DENIED** – if one or more data validations fails
- **IN_QUEUE** – if the ramp availability validation fails but all other data validations are successful

1.7.5 Modify an Existing Ramp Reservation

Users may modify an existing Ramp Reservation by first retrieving the reservation from either the Organizer or the Reserve Ramp screen.

1. The *From Interface* and *To Interface* selections may not be modified.
2. Modify the existing reservation energy profile (start, stop, MW)
    a. Specify a start and stop date
    b. Specify a start and stop time.
    c. Specify a MW value.
3. For each completed energy interval, click the Add Energy button located under the MW/Price field(s). The energy profile will be added to the table at the right and to the chart below. The energy profiles will have a WORKING status.
4. Energy intervals in WORKING status may be discarded by clicking on the trash-can icon in the Action column.
5. When all energy profile intervals have been completed, click the Submit button above the energy interval table to validate the reservation.

WORKING profiles submitted using the “Submit” button will receive the following status:

- **PENDING_TAG** – if all data validations are successful. If the Ramp Reservation had an existing PENDING_TAG profile, the existing profile and the WORKING profile will be merged into a single PENDING_TAG profile.
- **DENIED** – if one or more data validations fails. If the Ramp Reservation had an existing DENIED profile, the existing profile will be deleted and the WORKING profile will transition to a new DENIED profile.

WORKING profiles submitted using the “Queue” button will receive the following status:

- **PENDING_TAG** – if all data validations are successful. If the Ramp Reservation had an existing PENDING_TAG profile, the existing profile and the WORKING profile will be merged into a single PENDING_TAG profile.
- **DENIED** – if one or more data validations fails. If the Ramp Reservation had an existing DENIED profile, the existing profile will be deleted and the WORKING profile will transition to a new DENIED profile.
- **IN_QUEUE** – if the ramp availability validation fails but all other data validations are successful. If the Ramp Reservation had an existing IN_QUEUE profile, the existing profile and the WORKING profile will be merged into a single IN_QUEUE profile.

1.7.6 Save a Ramp Reservation

Users may save a Ramp Reservation for further editing at a later time or for use in the Batch Submission process. Minimal data validations will be performed when saving a WORKING profile.

1. A selection must be made in both the *From Interface* and *To Interface* dropdown lists in order to establish a scheduling path.
2. At least one energy interval must be created
   a. Specify a start and stop date
   b. Specify a start and stop time.
   c. Specify a MW value.
3. For each completed energy interval, click the Add Energy button located under the MW/Price field(s). The energy profile will be added to the table at the right and to the chart below. The energy profiles will have a WORKING status.
4. When all energy profile intervals have been completed, click the Save button above the energy interval table.

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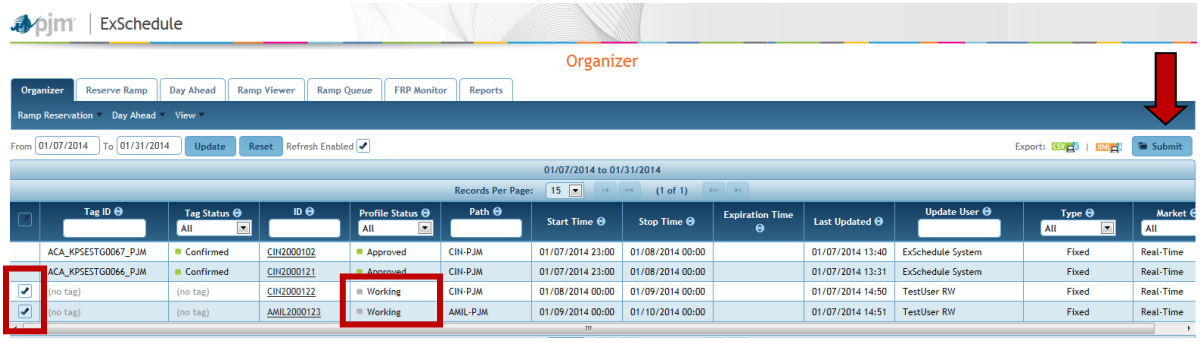
1.7.7 Batch Submission

Users may submit several Ramp Reservations at once in order to have them evaluated as a group. Of specific note is that the ramp availability validation will apply to the net energy profile of all reservations in the batch as opposed to each reservation's individual energy profile.

Ramp Reservation profile types eligible for Batch Submission are DENIED, WORKING, and IN_QUEUE. If the Batch Submission is successful, the selected profiles will transition to PENDING_TAG status. If the Batch Submission fails a data validation, the selected profiles will remain in their previous statuses.

Batch Submission is accomplished via the Organizer:

1. Select one or more Ramp Reservations for the batch
2. Click the Submit button on the upper right side of the Organizer



1.7.8 Ramp Reservation Auto-Creation and Auto-Modification

Users may skip the process of manually creating and attaching a Ramp Reservation to a Tag by submitting the Tag without referencing a Ramp Reservation. ExSchedule will detect that no Ramp Reservation has been associated with the Tag and will attempt to create a reservation on the user's behalf. The auto-created Ramp Reservation will be subject to all normal data validations.

Similarly, if a user attaches a Ramp Reservation to a Tag, but the reservation energy profile and the Tag energy profile do not match, ExSchedule will attempt to modify the Ramp Reservation to match the Tag. The auto-modification of the reservation will be subject to all normal data validations.

1.7.9 Withdraw an Existing Ramp Reservation

Users may withdraw PENDING_TAG, DELAYED, IN_QUEUE, and WORKING profiles.

1. From the *"Withdraw"* menu select *Withdraw Pending/Delayed, Withdraw In-Queue or Withdraw Working.* If these options are grayed out then the Ramp Reservation has no energy profiles with these statues.
2. A confirmation box will ask if you would like to proceed with the withdraw action.
3. Click *"OK"* to continue with the withdrawal or click *"Cancel" to* back out of the withdrawal.

If the withdrawal is successful, the selected profiles will transition to WITHDRAWN status.

1.7.10 Ramp Reservation Tools

Several features have been implemented in ExSchedule to assist users with the Ramp Reservation creation workflow.

1.7.10.1 Resubmit an Existing Ramp Reservation

Users may resubmit DENIED and EXPIRED Ramp Reservations instead of being required to manually recreate those energy profiles.

1. From the "Resubmit" menu select Denied Profile or Expired Profile. If these options are grayed out then the Ramp Reservation has no energy profiles with these statuses.
2. ExSchedule will revalidate the energy profile and assign the appropriate status.

1.7.10.2 Create a Working Profile from an Existing Profile

Users may use DENIED, EXPIRED, or WITHDRAWN profiles as templates to create a new WORKING profile.

1. From the "Create Working From" menu select Denied Profile, Expired Profile, or Withdrawn Profile. If these options are grayed out then the Ramp Reservation has no energy profiles with these statuses.
2. ExSchedule will create a new WORKING profile that matches the template profile.

1.7.10.3 Check Ramp

Users may initiate the ramp availability validation on WORKING, DENIED, and EXPIRED profiles prior to submission.

1. From the "Check Ramp" menu select Working Profile, Denied Profile, or Expired Profile. If these options are grayed out then the Ramp Reservation has no energy profiles with these statuses.
2. ExSchedule will indicate whether the profile passed or failed the ramp availability validation.

The Check Ramp function will not change a Ramp Reservation's profile status.

1.7.10.4 Copy Energy Interval

A button has been added to the Actions column of the Energy Interval Table that will copy the interval Start/Stop/MW values over to the entry form to the left of the table. This feature is designed to assist users in quickly editing an existing energy interval.

1.7.10.5 Working MWh

A Working MWh total has been added to the footer of the Energy Interval Table. This field calculates and displays the total MWh of the energy intervals contained within the WORKING profile. This feature is intended to assist users in quickly assessing the overall magnitude of their WORKING profile, prior to submission.

1.8 Dispatchable Reservations

ExSchedule users can create and modify Dispatchable Reservations as an optional step in the Tag submission process. Dispatchable Reservation functionality can be accessed via the Reserve Ramp screen.

Dispatchable Reservations are used to specify a floor or ceiling price for each energy interval to be used as a condition for the Tag's flow. Tags with a Dispatchable Reservation attached will flow only if Real-time forecast LMPs meet the specified price criteria.

For Imports, the price is considered a floor price; in other words, the Market Participant only desires to sell energy to PJM if the LMP is at least equal to the specified price.

For Exports, the price is considered a ceiling price; in other words, the Market Participant only desires to purchase energy from PJM if the LMP is less than the specified price.

1.8.1 Dispatchable Reservation Data Definitions

Column Name	Column Description	System Generated	Required	Optional
Ramp Res ID	This will be the unique identifier for the Dispatchable Reservation. It will be formed by the combination of either the scheduling interface acronym (for imports and exports) or "WPJM" (for wheels) followed by a numerical ID generated by ExSchedule (e.g. WPJM1234, NYIS1234).	X		
NERC Tag ID	This field will be populated with the Tag ID when a Dispatchable Reservation has been attached to a	X		

Column Name	Column Description	System Generated	Required	Optional
	Tag.			
Status	The current Dispatchable Reservation status	X		
Owner	The company who owns the Dispatchable Reservation.	X		
Last Updated Agent	The user who last updated the Dispatchable Reservation.	X		
Update Timestamp	The timestamp at which the Dispatchable Reservation was last updated.	X		
Expiration Timestamp	The timestamp at which the Dispatchable Reservation will expire if not linked to a Tag	X		
In-Queue Timestamp	Not applicable to Dispatchable Reservations	X		
Outside Name	Users can attach a custom label to their Dispatchable Reservations			X
From Interface	Scheduling interface where the Dispatchable Reservation will source		X	
To Interface	Scheduling interface where the Dispatchable Reservation will sink.		X	
Outside ID	Users can attach a custom reference ID to their Dispatchable Reservation.			X
Comment	Users can add additional information pertaining to the Dispatchable Reservation.			X

1.8.2 Dispatchable Reservation Profile Types

An ExSchedule Dispatchable Reservation is a container that may hold multiple different profiles. A profile is a collection of start/stop/MW energy intervals. At any given time, a Dispatchable Reservation may contain a minimum of one profile and a maximum of one of each of the profile types listed below.

*All Profile Types listed in Section 1.7.2 are also applicable to Dispatchable Reservations with the exception of IN_QUEUE and PENDING_TAG. The table below lists only the additional Dispatchable-specific types.

Profile Type	Description
PROPOSED	A Dispatchable Reservation that has successfully passed all data validations at the time of submission, but which has not yet been attached to a Tag. This profile does not reserve or impact ramp capability, but instead holds the MW/Price profile of the Dispatchable reservation.
DISPATCHABLE	A Dispatchable Reservation that has been successfully attached to a Tag. This profile does not reserve or impact ramp capability, but instead holds the MW/Price profile of the Dispatchable reservation. DISPATCHABLE profiles exist alongside the normal APPROVED profile that reflects the start/stop/MW value of the Tag.

1.8.3 Dispatchable Reservation Data Validations

Dispatchable Reservation submissions must pass multiple data validations:

1. **Scheduling Path** – the scheduling path must be valid for the entire duration of the Dispatchable Reservation energy profile
2. **Timing Requirements** – the Dispatchable Reservation must be submitted sufficiently far in advance of the reservation start time to respect the timing requirements established in the Regional Practices
3. **Maximum MW** - MW must be an integer and the user-specified value may not exceed a maximum of 1500 MW.
4. **Scheduling Interval** – specified start and stop times must be locked to quarter-hour intervals (xx:00, xx:15, xx:30, or xx:45.)
5. **Dispatch Price** - A single price in $ must be specified for each interval. The price may contain two decimal places and may not exceed $2,000.

1.8.4 Create a New Dispatchable Reservation

Users may create a new Dispatchable Reservation by clicking New Dispatchable from the Ramp Reservation menu. The following steps must be completed.

1. Make a selection in both the *From Interface* and *To Interface* dropdown lists in order to establish a scheduling path.
2. Create a reservation energy profile (start, stop, MW)
   a. Specify a start and stop date.
   b. Specify a start and stop time.

c. Specify a MW value.

d. Specify a price.

3. For each completed energy interval, click the Add Energy button located under the MW/Price field(s). The energy profile will be added to the table at the right and to the chart below. The energy profiles will have a WORKING status.
4. Energy intervals in WORKING status may be discarded by clicking on the trash-can icon in the Action column.
5. When all energy profile intervals have been completed, click the Submit button above the energy interval table to validate the reservation.

WORKING profiles submitted using the “Submit” button will receive the following status:

- **PROPOSED** – if all data validations are successful
- **DENIED** – if one or more data validations fails

1.8.5 Modify an Existing Ramp Reservation

Users may modify an existing Dispatchable Reservation by first retrieving the reservation from either the Organizer or the Reserve Ramp screen.

1. The *From Interface* and *To Interface* selections may not be modified.
2. Modify the existing reservation energy profile (start, stop, MW)
   a. Specify a start and stop date.
   b. Specify a start and stop time.
   c. Specify a MW value.
   d. Specify a price.
3. For each completed energy interval, click the Add Energy button located under the MW/Price field(s). The energy profile will be added to the table at the right and to the chart below. The energy profiles will have a WORKING status.
4. Energy intervals in WORKING status may be discarded by clicking on the trash-can icon in the Action column.
5. When all energy profile intervals have been completed, click the Submit button above the energy interval table to validate the reservation.

WORKING profiles submitted using the “Submit” button will receive the following status:

- **PROPOSED** – if all data validations are successful. If the Dispatchable Reservation had an existing PROPOSED profile, the existing profile and the WORKING profile will be merged into a single PROPOSED profile.

- **DENIED** – if one or more data validations fails. If the Dispatchable Reservation had an existing DENIED profile, the existing profile will be deleted and the WORKING profile will transition to a new DENIED profile.

1.8.6 Save a Dispatchable Reservation

Users may save a Dispatchable Reservation for further editing at a later time. Minimal data validations will be performed when saving a WORKING profile.

1. A selection must be made in both the *From Interface* and *To Interface* dropdown lists in order to establish a scheduling path.
2. At least one energy interval must be created
   a. Specify a start and stop date.
   b. Specify a start and stop time.
   c. Specify a MW value.
   d. Specify a price.
3. For each completed energy interval, click the Add Energy button located under the MW/Price field(s). The energy profile will be added to the table at the right and to the chart below. The energy profiles will have a WORKING status.
4. When all energy profile intervals have been completed, click the Save button above the energy interval table.

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1.8.7 Withdraw an Existing Dispatchable Reservation

Users may withdraw PROPOSED, and WORKING profiles.

1. From the *"Withdraw"* menu select *Withdraw Proposed or Withdraw Working.* If these options are grayed out then the Dispatchable Reservation has no energy profiles with these statues.
2. A confirmation box will ask if you would like to proceed with the withdraw action.
3. Click *"OK"* to continue with the withdrawal or click *"Cancel" to* back out of the withdrawal.

If the withdrawal is successful, the selected profiles will transition to WITHDRAWN status.

1.8.8 Dispatchable Reservation Tools

Several features have been implemented in ExSchedule to assist users with the Dispatchable Reservation creation workflow.

1.8.8.1 Create a Working Profile from an Existing Profile

Users may use DENIED, EXPIRED, or WITHDRAWN profiles as templates to create a new WORKING profile.

1. From the "Create Working From" menu select Denied Profile, Expired Profile, or Withdrawn Profile. If these options are grayed out then the Dispatchable Reservation has no energy profiles with these statuses.
2. ExSchedule will create a new WORKING profile that matches the template profile.

1.8.8.2 Copy Energy Interval

A button has been added to the Actions column of the Energy Interval Table that will copy the interval Start/Stop/MW values over to the entry form to the left of the table. This feature is designed to assist users in quickly editing an existing energy interval.

1.8.8.3 Working MWh

A Working MWh total has been added to the footer of the Energy Interval Table. This field calculates and displays the total MWh of the energy intervals contained within the WORKING profile. This feature is intended to assist users in quickly assessing the overall magnitude of their WORKING profile, prior to submission.

1.9 Coordinated Transaction Scheduling (CTS)

1.9.1 CTS Bid Data Definitions

Column Name	Column Description	System Generated	Required	Optional
CTS Bid ID	A unique identifier for the CTS Bid, beginning with a prefix of "CTS" followed by a sequential number.	X		
Status	The current status of the CTS Bid.	X		
Owner	The organization which holds financial responsibility for the CTS Bid. This designation is assigned to the organization that creates the CTS Bid within ExSchedule.	X		

Column Name	Column Description	System Generated	Required	Optional
Update Agent	The user who last updated the CTS Bid.	X		
Last Updated	The time at which the CTS Bid was last updated.	X		
From_Market	The market from which power will be exported.		X	
To_Market	The Market to which power will be imported.		X	
Nerc Tag ID	The Tag ID to which the CTS Bid is linked.	X		
Ramp Res ID	The ramp reservation ID associated to the linked Tag	X		
Outside Name	Users can attach a custom label to the CTS Bid			X
Expiration Time	The time at which the CTS Bid can no longer be linked to a Tag.	X		
Start Date/Time	Energy Profile Start Date/Time		X	
Stop Date/Time	Energy Profile Stop Date/Time		X	
MW	The MW amount that will be adjusted on the Tag if the associated price spread is cleared by the CTS engine.		X	
Price	The price spread required for the associated MW value to be cleared by the CTS engine.		X	

1.9.2 CTS Bid Profile Types

An ExSchedule CTS Bid is a container that may hold multiple different profiles. A profile is a collection of start/stop/MW/price intervals. At any given time, a CTS Bid may contain a minimum of one profile and a maximum of one of each of the profile types listed below.

Profile Type	Description
WORKING	Actively being created or modified but has not been submitted. WORKING profiles may be saved.
REQUESTED	Successfully passed bid validations at submission, but has not been attached to a Tag (or has not yet passed Tag validation)
DENIED	Bid that fails PJM's business rule validations at the time of

	submission.
EXPIRED	Previously contained a REQUESTED profile which was not successfully attached to a Tag prior to the bid expiration deadline.
WITHDRAWN	Profile withdrawn by the user. A profile cannot be withdrawn once attached to a Tag.
TAG_LINKED	Profile has been attached to a Tag but the Tag has not yet reached a final state
VALIDATED	Bid has passed PJM's Tag validations and the Tag has reached a final Approved state. Bids in a VALIDATED state will be evaluated by the CTS engine.
CLEARED	The bid has been successfully evaluated by the CTS engine.

1.9.3 CTS Bid Data Validations

CTS Bid submissions must pass multiple data validations:

1. Start time of the bid must be more than 75 mins from the time the CTS bid is created
2. CTS bid profile duration must be between 15 minutes and 25 hours.
3. Start and Stop times must fall on quarter-hour intervals(i.e. xx:00, xx:15, xx:30, xx:45)
4. Energy profile must have at least 1 price/MW pair
5. MW for the bid point should be an integer and user-specified value must be between 1 MW and 1,500 MW.
6. Price for the bid point must be between $0.01 and $1,000.00.
7. MW and Price values for each bid point must both increase as compared to the previous bid point.

1.9.4 Create a New CTS Bid

Users may create a new CTS bid by clicking either New CTS Bid from the CTS menu on the Organizer or New CTS Bid under the CTS menu on the CTS tab.

1. Make a selection in From Market and To Market dropdown lists.
2. Create a bid energy profile (start, stop, MW, price)
   a. Click on Build Profile.
   b. Specify a start and stop date.
   c. Add at least one bid point. Bid points (MW & Price). Additional bid points must increase in ascending order.
3. Click on Add Energy.

4. The energy profile will have a WORKING status and will be added to the CTS Bid table right below the Build Profile section.
5. Energy intervals in WORKING status can be discarded by clicking on the trash-can icon in the Actions column.
6. When all energy profile intervals have been completed, click the Submit button above the Build Profile section.

WORKING profiles submitted using the Submit button will receive the following status:

- **REQUESTED** – if all data validations are successful
- **DENIED** – if one or more data validations fails
- **EXPIRED** – if the bid is not attached to a tag prior to expiration.

1.9.5 Modify an Existing CTS Bid

Users may modify an existing CTS Bid by first retrieving the bid from either the Organizer or the CTS Tab.

1. The From Market and To Market cannot be modified.
2. For any Validated status bid, Create a bid energy profile (start, stop, MW, price)
    a. Click on Build Profile.
    b. Specify a start and stop date.
    c. Add at least one bid point. Bid points (MW & Price). Additional bid points must increase in ascending order.
3. Click on Add Energy
4. The energy profile will have a WORKING status and will be added to the CTS Bid table right below the Build Profile section.
5. Energy intervals in WORKING status can be discarded by clicking on the trash-can icon in the Actions column.
6. When all energy profile intervals have been completed, click the Submit button above the Build Profile section.
7. If corresponding Tag request goes to approved state modified VALIDATED profile will overwrite previous VALIDATED profile.

1.9.6 Save a CTS Bid

Users may save a CTS Bid for further editing at a later time. Minimal data validations will be performed when saving a WORKING profile.

1. Make a selection in From Market and in To Market dropdown lists.
2. Create a bid energy profile (start, stop, MW, price)
   a. Click on Build Profile.
   b. Specify a start and stop date.
   c. Add at least one bid point. Bid points (MW & Price). Additional bid points must increase in ascending order.
3. Click on Save.

1.9.7 Cleared CTS Bids and Market Adjustments

Once a CTS Bid has received a VALIDATED status, ExSchedule will send the bid for inclusion in PJM's and MISO's market evaluation system. The CTS Market results will be posted back to ExSchedule approximately 25 minutes before the flow time for each interval. Each bid that was included in the market will be given CLEARED status and the result intervals will be shown on the bid. The Sink BA for each bid will issue a Market Adjustment request to adjust the Tag to the Cleared MW value. Users can view Cleared results for each bid by retrieving the bid from either the Organizer or the CTS tab. Users can also view the associated Ramp Reservation to verify the Tag energy profile resulting from the Market Adjustment request.

1.9.8 Withdraw a CTS Bid

Users may withdraw an existing CTS Bid by first retrieving the bid via the Organizer or the CTS tab

1. Select an option from the Withdraw menu
   a. Withdraw Requested
      CTS Bids in REQUESTED status will be transitioned to WITHDRAWN status
   b. Withdraw Working
      CTS Bids in WORKING status will be transitioned to WITHDRAWN status

1.9.9 Auto-Modification of CTS Bids on termination & cancellation

Users may submit termination or cancelation requests directly from the Tag without making corresponding modifications to the CTS bid. Upon approval of the termination or cancelation

request ExSchedule will automatically adjust the bid's MW to zero and set the bid to the VALIDATED state.

1.9.10 CTS Bid Tools

1.9.10.1 Create a Working Profile from an Existing Profile

Users may use DENIED, EXPIRED, or WITHDRWAWN profiles as templates to create a new WORKING profile.

1. From the "Create Working From" menu select Denied Profile, Expired Profile, or Withdrawn Profile. If these options are grayed out then the CTS Bid has no energy profiles with these statuses.
2. ExSchedule will create a new WORKING profile that matches the template profile.

1.9.10.2 Copy Energy Interval

A button has been added to the Actions column of the Energy Interval Table that will copy the interval Start/Stop/MW/Price values to the Build Profile form above the table. This feature is designed to assist users in quickly editing an existing energy interval.

1.9.10.3 Explode Intervals

Two buttons have been added to the Actions column of the Energy Interval Table.

- **60-minute intervals** – this button will create a new WORKING profile containing the current row exploded into 60-minute segments
- **15-minute intervals** – this button will create a new WORKING profile containing the current row exploded into 15-minute segments

This feature is intended to assist users in quickly manipulating their CTS Bid price curves as real-time conditions change. When the CTS Bid modifications are submitted, ExSchedule will recombine the profile into as few rows as possible.

1.10 Day-ahead Bids

ExSchedule users can create and modify Day-ahead Bids that will be included in PJM's Day-ahead Market.

ExSchedule currently supports two bid types.

- Fixed
  This bid type is a price-taker with no preconditions. The bid will receive the Day-ahead LMP that results from the market clearing.

- Dispatchable
  This bid type gives the Market Participant an opportunity to specify a floor or ceiling price as a condition for the bid's acceptance in the Day-ahead market. The bid will receive the Day-ahead LMP during the hours that meet the bid's economic criteria.

1.10.1 Day-ahead Bid Data Definitions

Column Name	Column Description	System Generated	Required	Optional
Day Ahead ID	This will be the unique identifier for the Day-ahead Bid. They begin with the letter "T" plus a sequential number.	X		
Status	The Day-ahead Bid status received upon submission.	X		
Owner	The PSE responsible for Day-ahead Bid. This will be the company which enters the Day-ahead Bid.	X		
Last Updated Agent	The user which updated the Day-ahead Bid last.	X		
Last Updated	The timestamp at which the Day-ahead Bid was last updated.	X		
Total MWh	Total Megawatt Hours of the Day-ahead Bid	X		
Import Pricing Point	Import Pricing Points available for user selection		X	
Export Pricing Point	Export Pricing Points available for user selection		X	
OASIS ID	PJM OASIS reservation specified by user		X	
Direction	The Direction of the Day-ahead Bid (Import, Export, Wheel)	X		
Start Date/Time	Energy Profile Start Date/Time		X	
Stop Date/Time	Energy Profile Stop Date/Time		X	
MW	MW amount of energy profile		X	
Price - Dispatchable Only	Price used to clear the energy interval in the Day-ahead Market		X	

1.10.2 Day-ahead Bid Profile Types

An ExSchedule Day-ahead Bid is a container that may hold multiple different profiles. A profile is a collection of start/stop/MW energy intervals. At any given time, a Day-ahead Bid may contain a minimum of one profile and a maximum of one of each of the profile types listed below.

Profile Type	Description
ACCEPTED	Assigned to a Day-ahead Bid that successfully passed all data validations at the time of submission and which will be included in the Day-ahead Market at the expiration of the Day-Ahead Market submission deadline.
CLEARED	The status assigned after a Day-ahead Bid has been evaluated in the Day-ahead Market. An energy profile with a CLEARED status represents the MW amount awarded in the Day-Ahead Market based on the participant's pricing criteria. If there is no award, the profile will show 0 MW.
DENIED	Assigned to a Day-ahead Bid that fails data validations at the time of submission.
PENDING_OASIS	Assigned to a Day-ahead Bid that has passed every data validation with the exception of the evaluation of the OASIS ID attached to the Bid. The Day-ahead Bid will be reevaluated immediately prior to inclusion in the Day-ahead Market. The bid will receive either ACCEPTED or DENIED status after the revalidation.
WITHDRAWN	Assigned to a Day-ahead Bid that was withdrawn by the user.
WORKING	Assigned to a Day-ahead Bid that is actively being created or modified but has not been submitted. WORKING profiles may be saved for further modification at a later date.

1.10.3 Day-ahead Bid Data Validations

Day-ahead Bid submissions must pass multiple data validations:

1. OASIS ID – the attached Transmission Service reservation must be in Confirmed status, must be of the type "Willing to Pay Congestion" and must have at least 1 MW available to cover the entire Day-ahead Bid energy profile.
2. Pricing Points – the selected Pricing Points must be valid for the entire duration of the Day-ahead Bid energy profile.
3. Direction – the path direction of the attached Transmission Service reservation must align with the implied path from the Pricing Point selections.
    a. Import path = Import Pricing Point only
    b. Export path = Export Pricing Point only

c. Wheel path = Both Import and Export Pricing Point

4. Timing Requirements – the Day-ahead Bid must be submitted prior to the Day-ahead Market submission deadline.
5. **Maximum MW** - MW must be an integer and the user-specified value may not exceed a maximum of 1500 MW.
6. **Scheduling Interval** – specified start and stop times must be locked to quarter-hour intervals (xx:00, xx:15, xx:30, or xx:45.)
7. **Dispatch Price** – (Dispatchable Bid only) A single price in $ must be specified for each interval. The price may contain two decimal places and may not exceed $2,000.

1.10.4 Create a New Day-ahead Bid

Users may create a new Day-ahead Bid by clicking either New Fixed Price or New Dispatchable from the Day Ahead menu. The following steps must be completed.

1. Make a selection in one or both of the Import and Export Pricing Point dropdown lists
2. Type or search for a Transmission Service reservation in the OASIS ID field. All Transmission Service reservations owned by the user's company for a specific date range are visible in the OASIS dialogue page that is displayed when the OASIS search tool is clicked.
3. Create a bid energy profile (start, stop, MW)
   a. Specify a start and stop date
   b. Specify a start and stop time.
   c. Specify a MW value.
   d. *Specify a price.*
4. For each completed energy interval, click the Add Energy button located under the MW/Price field(s). The energy profile will be added to the table at the right and to the chart below. The energy profiles will have a Working status.
5. Energy intervals in Working status may be discarded by clicking on the trash-can icon in the Actions column.
6. When all energy profile intervals have been completed, click the Submit button above the energy interval table to validate the Bid.

Working profiles submitted using the "Submit" button will receive the following status:

- **Accepted** – if all data validations are successful
- **Denied** – if one or more data validations fails
- **Pending OASIS** – if all data validations except the OASIS ID evaluation are successful

1.10.5 Modify an Existing Day-ahead Bid

Users may modify an existing Day-ahead Bid or Dispatchable Bid by first retrieving the bid from either the Organizer or the Day Ahead screen.

1. The Import and Export Pricing Point selections may not be modified
2. The OASIS ID selections may not be modified
3. Modify the existing bid energy profile (start, stop, MW)
    a. Specify a start and stop date
    b. Specify a start and stop time.
    c. Specify a MW value.
    d. *Specify a price.*
4. For each completed energy interval, click the Add Energy button located under the MW/Price field(s). The energy profile will be added to the table at the right and to the chart below. The energy profiles will have a Working status.
5. Energy intervals in Working status may be discarded by clicking on the trash-can icon in the Action column.
6. When all energy profile intervals have been completed, click the Submit button above the energy interval table to validate the reservation.

Working profiles submitted using the “Submit” button will receive the following status:

- **Accepted** – if all data validations are successful
- **Denied** – if one or more data validations fails
- **Pending OASIS** – if all data validations except the OASIS ID evaluation are successful

1.10.6 Save a Day-ahead Bid

Users may save a Day-ahead Bid for further editing at a later time. Minimal data validations will be performed when saving a Working profile.

1. A selection must be made in one or both of the Import and Export Pricing Point fields
2. An entry must be made in the OASIS ID field
3. At least one energy interval must be created
    a. Specify a start and stop date
    b. Specify a start and stop time.
    c. Specify a MW value.
    d. *Dispatchable Bid Only* – Specify a price.

4. For each completed energy interval, click the Add Energy button located under the MW/Price field(s). The energy profile will be added to the table at the right and to the chart below. The energy profiles will have a Working status.
5. When all energy profile intervals have been completed, click the Save button above the energy interval table.

1.10.7 Cleared Day-ahead Bids

Once a Day-ahead Bid has received an Accepted status and the submission deadline has passed, ExSchedule will send the bid for inclusion in PJM's Day-ahead Market. The Day-ahead Market results will be posted back to ExSchedule starting at 13:30 each day but possibly later depending on when the Day-ahead case is completed. Each bid that was included in the market will be given Cleared status and the result intervals will be shown on the bid.

1.10.8 Withdraw an existing Day-ahead Bid

Users may withdraw an existing Day-ahead Bid or Dispatchable Bid by first retrieving the bid from either the Organizer or the Day Ahead screen.

1. Select an option from the Withdraw menu
   a. Withdraw Accepted
      Day-ahead Bids in Accepted status may be withdrawn prior to the expiration of the Day-Ahead Bid submission deadline. For multi-day bids that have already been partially included in the Day-ahead Market on previous calendar days, the users must modify the remaining energy profile to 0 MW in order to withdraw the bid. (this latter action will not result in a Withdrawn status, but the Bid is effectively withdrawn)

   b. Withdraw Pending
      Day-ahead Bids in Pending OASIS status will be transitioned to Withdrawn status.
   c. Withdraw Working
      Day-ahead Bids in Working status will be transitioned to Withdrawn status.

1.10.9 Day-ahead Bid Tools

1.10.9.1 Create a Working Profile from an Existing Profile

Users may use Denied and Withdrawn profiles as templates to create a new Working profile.

1. From the "Create Working From" menu select Denied Profile or Withdrawn Profile. If these options are grayed out then the Day-ahead Bid has no energy profiles with these statuses.
2. ExSchedule will create a new working profile that matches the template profile.

1.10.9.2 Copy Energy Interval

A button has been added to the Actions column of the Energy Interval Table that will copy the interval Start/Stop/MW values over to the entry form to the left of the table. This feature is designed to assist users in quickly editing an existing energy interval.

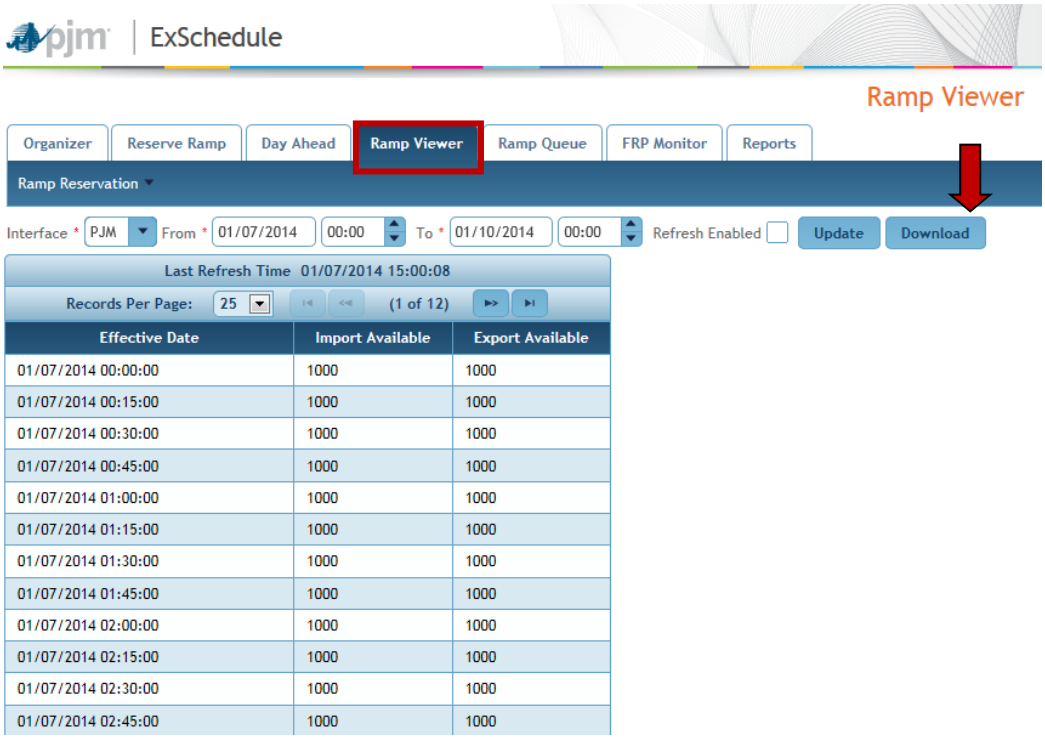
1.10.9.3 Working MWh

A Working MWh total has been added to the footer of the Energy Interval Table. This field calculates and displays the total MWh of the energy intervals contained within the Working profile. This feature is intended to assist users in quickly assessing the overall magnitude of their Working profile, prior to submission.

1.11 Ramp Viewer

ExSchedule users can view Available Ramp via the Ramp Viewer screen. The Ramp Viewer displays available ramp for all intervals in a user-specified time range. The ramp viewer can be refreshed manually or set to auto-refresh every 60 seconds.

Users may also choose to download the displayed ramp availability values into an XML file.



Effective Date	Import Available	Export Available
01/07/2014 00:00:00	1000	1000
01/07/2014 00:15:00	1000	1000
01/07/2014 00:30:00	1000	1000
01/07/2014 00:45:00	1000	1000
01/07/2014 01:00:00	1000	1000
01/07/2014 01:15:00	1000	1000
01/07/2014 01:30:00	1000	1000
01/07/2014 01:45:00	1000	1000
01/07/2014 02:00:00	1000	1000
01/07/2014 02:15:00	1000	1000
01/07/2014 02:30:00	1000	1000
01/07/2014 02:45:00	1000	1000

1.12 Ramp Queue

ExSchedule users can view their Ramp Reservation's position in the ramp availability queue via the Ramp Queue screen.

Ramp Reservations receive an In-Queue status when the ramp availability validation fails on a specific interval. Reservations with an In-Queue status will be continually evaluated for ramp availability in the failed interval based on their queue position. Ramp Reservations receive queue positions for a specific interval based on a first-come, first-serve basis.

If ramp becomes available for the failed interval, Ramp Reservations that pass the ramp availability validation will receive Pending Tag status.

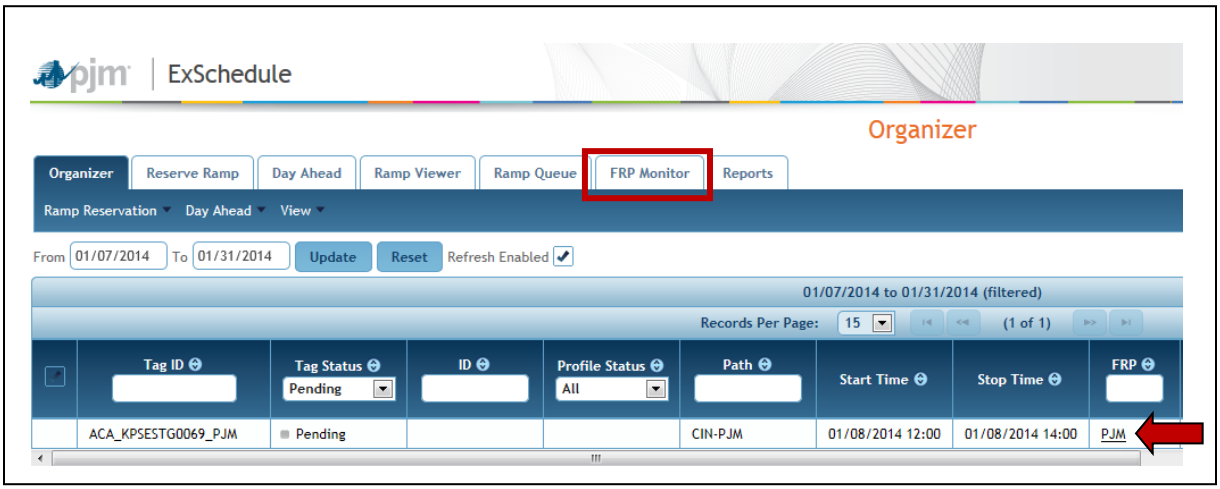
1.13 FRP Monitor

When a Tag is received by PJM in which the Market Participant listed as the Financial Responsible Party (FRP) on the PJM Transmission Provider (TP) line does not match the Market Participant who entered the Tag, PJM will put the Tag in "*Study*" status and the Financial Responsible Market Participant will appear in the FRP column on the ExSchedule Organizer.

The FRP Market Participant will need to Approve or Deny receipt of the Tag before PJM will further validate the Tag. Each modification made to such Tags will also need to be approved by the FRP before PJM will validate the request.

Use the following steps to Approve or Deny a Tag:

1. From the Organizer screen click on the Market Participant hyperlink or click on the FRP Monitor tab. Both will navigation you to the FRP Monitor screen.
2. Select "*Approved*" from the Status dropdown list to continue with validating the Tag or "*Denied*" to cancel the schedule before PJM will validate the Tag
3. Click *"Submit"* – ExSchedule will update the Tag accordingly



1.13.1 FRP Auto Approval Setup

ExSchedule allows companies to create automatic FRP approval mappings in order to skip the manual FRP approval process.

1. From the Organizer screen click on the Market Participant hyperlink or click on the FRP Monitor tab. Both will navigation to the FRP Monitor screen.
2. Click on the "*Add Organization*" button. A new dialogue box will allow the selection of a FRP (one of the company's mapped scheduling desks) and the manual entry of a PSE acronym to identify the Tag Creator PSE.
3. Click the *"Save"* button and the entry will be listed in the FRP Automatic Approvals table.
4. Click "*Cancel*" to abandon the update

1.14 Reports

ExSchedule users can access Day-Ahead and Real-Time scheduling reports via the Reports screen. From the Reports screen, users may choose a report type and select a date range before generating the report. Report data can be viewed in the browser or exported to a CSV or XML file. Reports can be generated for a maximum of 31 days at a time.

The following report types are available in ExSchedule:

Day Ahead Bid

Will list all Day-ahead Bids that belong to the user's company.

Column	Description
Day Ahead ID	The Day-ahead Bid identifier
Profile Status	The status of the Day-ahead Bid
Type	Fixed or Dispatchable
OASIS ID	The Transmission Service reservation specified on the Bid
Start Time	Energy interval start time

Stop Time	Energy interval stop time
Requested MW	The MW requested for that energy interval
Cleared MW	The MW cleared in the Day-ahead Market (available after 13:30 EPT each day)

Tag Reservation

Will list all Approved Ramp Reservations and associated Tags that belong to the user's company.

Column	Description
Tag ID	The Tag ID associated with the Ramp Reservation
RampRes ID	The Ramp Reservation identifier
Owner	The company who owns the Ramp Reservation
OASIS ID	The Transmission Service reservation specified for the specific energy interval
Type	Fixed (normal) or Dispatchable
Start Time	Energy interval start time
Stop Time	Energy interval stop time
Transmission MW	The Transmission Service MW allocated to that specific energy interval on the Tag
Requested MW	The MW requested for that energy interval on the Tag
Actual MW	The actual MW that will flow in that energy interval after Tag Curtailments have been applied

Credit Usage

Will list all Export Tags that belong to the user's company along with the calculated financial impact.

Column	Description
Tag ID	The Tag ID for which a credit impact has been calculated
Start Time	Energy interval start time
Stop Time	Energy interval stop time

Column	Description
Tag MW	The actual MW that will flow in that energy interval
Pricing Point	The Interface Pricing Point assigned to the Export Tag
Credit Used	The calculated credit impact for the energy interval
Credit Limit	The company's credit limit, as allocated in PJM's eCredit application
Total	The total credit impact of all reported Export Tags

CTS Bid

Will list all CTS Tags that belong to the user's company along with the calculated financial impact.

Column	Description
CTS Bid ID	The CTS Bid identifier
Profile Status	The status of the CTS Bid
Tag ID	The Tag ID associated with CTS bid
Start Time	Energy interval start time
Stop Time	Energy interval stop time
Requested MW	The MW requested for that energy interval on the Tag (this gets updated once it get adjusted if its cleared in market)
Cleared MW	The MW cleared by ISO's market engine
Actual MW	The actual MW that will flow in that energy interval after Tag Curtailments have been applied

1.15 File Transfers

PJM allows users to transfer XML formatted files to and from the ExSchedule system through a browserless Java-based application called the PJM Command Line Interface (CLI). File transfers must be formatted according to the requirements in the PJM Command Line Interface (CLI) document which is located at: http://www.pjm.com/markets-and-operations/etools/exschedule.aspx

PJM provides this specification to aid customers in building an external interface to the ExSchedule application. PJM will provide assistance to customers seeking to understand or clarify details in this specification. However, due to the customizable nature of this external interface and the varied environments in which PJM customers will implement it, PJM is unable to provide application support for these customer-built external interfaces.

1.16 Schedule Summary

The ExSchedule Summary Screen is used by Neighboring Balancing Authorities that need to reconcile Tags and Ramp Reservations entered into PJM's system. Tags will be displayed in 15 minute intervals within a selected date range.

The Hourly Integrated option shows system operators the total MW flowing in each hour per Approved Tags. The user will see for a column for each of the hours in a day.

The data can also be exported to a CSV file by clicking on "*Export to CSV* "

Section 2: Appendices

Welcome to the Appendices section of the PJM User Guide for **PJM ExSchedule**. Appendices will be added as needed to explain certain scheduling concepts in more detail than is possible in Section 1 of the user guide.

2.1 Delayed Ramp Profiles

What are Delayed Ramp Profiles?

Delayed Ramp profiles are a type of Ramp Reservation exclusive to the NYISO, Hudson, LindenVFT, and Neptune interfaces. Ramp Reservations created on these interfaces will receive Delayed status instead of the normal Pending Tag and Approved statuses.

Unlike normal Ramp Reservations, Delayed profiles are not initially validated against PJM's net ramp limits, nor do they reduce the net ramp capability available to other Market Participants. The result is that participants can create as many Delayed profiles as they need without concern for hitting up against PJM's net ramp limits. However, when the NYISO issues preliminary and/or final market results for an interval, PJM will react by converting Delayed profiles into normal Approved profiles. Once this occurs, the portion of the Delayed profile that was converted to an Approved profile will begin to hold ramp and will reduce the net ramp capability available to other Market Participants.

The primary method for conversion from Delayed to Approved status is via Tag curtailments. The portion of a Tag that is covered by a finalized curtailment request will be converted to an Approved profile. In the event that there are no curtailments issued on a Tag, ExSchedule will wait until the Delayed profile is within 30 minutes of real-time flow before initiating a conversion. This process will transition the 15-minute interval in the Delayed profile that is about to start flowing into an Approved profile.

Why has PJM Introduced Delayed Ramp Profiles?

Several PJM stakeholders raised concerns in the NYISO-PJM Coordinated Transaction Scheduling (CTS) forums about ramp availability potentially being impacted due to CTS bidding activity starting in November 2014. Delayed Ramp profiles have been designed to mitigate the long-standing ramp availability issues that stem from market bidding activity on the NY interface. PJM will continue to review and make refinements to the functionality as needed.

How Will Delayed Ramp Profiles Impact Market Participants?

For the most part, Market Participants only need to be aware of the Delayed profile concept since the Delayed status will be visible within ExSchedule. PJM has no requirements that participants modify their scheduling processes or behavior.

An important consideration is the topic of Ramp Priority since PJM allocates ramp availability on a first-come, first-serve basis. When normal Ramp Reservations are submitted, they receive a ramp priority timestamp that PJM uses to determine who is eligible for curtailment, should the need arise. Any actions by the Market Participant that result in a modification to their Ramp Reservation will cause the priority timestamp to be refreshed. This same priority methodology will continue to apply to Delayed Ramp profiles, but with a few nuances:

- If the NYISO clears a participant's bid in full (no Tag modifications required), the Delayed Ramp profile will keep its original priority timestamp as PJM converts the profile to Approved status
- If the NYISO clears a portion of a participant's bid and issues a Tag curtailment to modify the Tag's energy profile to match the cleared bid, PJM will refresh the priority timestamp during the conversion from Delayed to Approved status

2.2 Export Schedule Credit Screening Process

What is the Export Schedule Credit Screening Process?

The Export Schedule Credit Screening Process refers to functionality within ExSchedule that ensures Market Participants have allocated via eCredit a sufficient portion of their posted collateral to cover their export interchange scheduling activity.

Why has PJM Introduced the Export Schedule Credit Screening Process?

As part of discussion in the NYISO-PJM Coordinated Transaction Scheduling (CTS) forums about the credit implications associated with CTS bidding activity, PJM's stakeholders requested that any changes introduced to PJM's credit policy also be extended to all Export Transactions. The associated functionality will be activated in November 2014 as part of the CTS implementation.

How Will the Export Schedule Credit Screening Process Impact Market Participants?

Per Attachment Q of the PJM OATT, Market Participants are required to set aside a portion of their posted collateral to cover export scheduling activity. The allocations are forwarded to ExSchedule where they are used to ensure that scheduling activity does not exceed the "limit" determined by the allocation. PJM will deny or curtail all Tags that exceed the limit.

Export Credit Exposure

A Market Participant's export credit exposure will be calculated as the sum of the credit impact calculated for each Export Tag on the current day plus one previous calendar day.

Export Transaction Screening

ExSchedule will perform the screening process via two methods. First, all new Tag requests that would cause a Market Participant's Export Credit Exposure to exceed their Export Credit Limit will be denied. Second, if new forecast prices cause the recalculation of a participant's existing Export Credit Exposure and an Export Credit Limit violation results, PJM will curtail every active Export Tag submitted by the participant.

Credit Usage Report

In the event Tag Curtailments are required, PJM will curtail all of a participant's Exports. PJM will not make decisions about which schedules, if any, might still be able to flow via partial reductions. To enable participants in understanding the reason for curtailment, ExSchedule contains a Credit Usage Report that provides the credit impact of each Tag as well as the organization's current limit and total exposure. If the participant determines via this report that a specific combination of schedules could be reloaded without causing an Export Credit Limit violation, they can contact the PJM Real-Time Transaction Desk at 610-666-4510 to request the reloads.

Revision History

Revision 00 (11/19/13)

Created a new document for the refreshed application that was previously Enhanced Energy Scheduler (EES) and is now ExSchedule. Updated the application Functionality in accordance with the new application screens and windows. This is the first release of the PJM Manual for ***PJM ExSchedule***

Revision 01 (01/24/14)

Completed updates to the document to further align it with the most recent ExSchedule enhancements and modifications. As ExSchedule is not yet released to a production environment, a detailed change log has not been provided.

Revision 02 (09/12/14)

- Added a section to illustrate the terminology differences between EES and ExSchedule.
- Added clarifying language to the section on Day-Ahead Bid Withdrawals, highlighting that Bids in Accepted status can be withdrawn up until the Day-Ahead Bid submission deadline.

Revision 03 (10/28/2014)

- Added a section to detail the ExSchedule Credit Usage report
- Added a section to describe the Delayed Ramp concept in more detail
- Added a section to describe the Export Schedule Credit Screen Process

Revision 04 (08/31/2016)

- Section 1.1.1 – clarified EES retirement date.
- Section 1.6.1 – updated notification screenshot
- Section 1.7.2 – added descriptions of Proposed and Dispatchable profiles
- Section 1.7.4 – updated the max Dispatchable price to be consistent with PJM manuals and added a profile example for a Dispatchable Reservation.
- Section 1.7.5 – added a profile example for a Dispatchable Reservation
- Section 1.7.6 – updated the max Dispatchable price to be consistent with PJM manuals
- Section 1.7.10.3 – added mention that Check Ramp functionality is not available for Dispatchable Reservations

Revision 05 (04/10/2017)

- Introduction – Removed sections: Using this User Guide, What You Will Find in This User Guide
- Section 1.2 – resorted table and added definition for CTS acronym
- Section 1.3 – added CTS function
- Section 1.5 – added mention of CTS
- Section 1.6 – added mention of CTS
- Section 1.6.3 – added mention of CTS
- Section 1.6.4 – added mention of CTS
- Section 1.6.5.2 – changed to reflect current Organizer layout and added mention of CTS
- Added Section 1.8 – Coordinated Transaction Scheduling and incremented section numbers for remaining headings in Section 1
- Section 1.13 – added CTS Bid report

Revision 06 (04/13/2017)

- Section 1.7.10.2 – modified to include Withdrawn profiles
- Added Section 1.7.10.4 – Copy Energy Interval Button
- Added Section 1.7.10.5 – Working MWh
- Added Section 1.8.9 – CTS Bid Tools
- Added Section 1.9.9 – Day-ahead Bid Tools
- Section 1.13 – modified the Day-ahead Bid results timing

Revision 07 (07/13/2017)

- Section 1.7.4 – modified the max Dispatchable Reservation price to align with PJM Manual 11
- Section 1.7.5 – modified the max Dispatchable Reservation price to align with PJM Manual 11
- Section 1.7.6 – modified the max Dispatchable Reservation price to align with PJM Manual 11

Revision 08 (04/12/2018)

- Section 1.7.4 – modified the max Dispatchable Reservation price to align with PJM Manual 11
- Section 1.7.5 – modified the max Dispatchable Reservation price to align with PJM Manual 11
- Section 1.7.6 – modified the max Dispatchable Reservation price to align with PJM Manual 11
- Section 1.9.4 – modified the max Dispatchable Reservation price to align with PJM Manual 11

- Section 1.9.5 – modified the max Dispatchable Reservation price to align with PJM Manual 11
- Section 1.9.6 – modified the max Dispatchable Reservation price to align with PJM Manual 11

Revision 09 (01/03/2019)

- Various minor edits for clarity
- Section 1.1.1 – ExSchedule vs. EES Terminology Changes removed as the transition is complete and this section is no longer necessary
- Section 1.4 – clarified that OASIS Transaction access is necessary to obtain ExSchedule read/write access
- Section 1.6.5.3 – added a link to the webRegistry PSE Mapping Code form
- Section 1.8 – Newly introduced for Dispatchable Reservations
    - All existing section numbers that come afterward have been incremented
- Appendix 2.2 – corrected the number of credit usage days considered in the evaluation to reflect the current day plus one previous calendar day

Revision 10 (10/22/2020)

- Various minor edits for clarity
- Section 1.4 – clarified that a linked NAESB EIR PSE Code is necessary to obtain full ExSchedule functionality

Revision 11 (11/05/2021)

- Various minor edits for clarity