



PJM Markets Gateway User Guide

Effective: October 1, 2025

For Public Use

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Current Revision

2025 Revision

October 2025

- Updated to reflect Regulation Redesign Phase 1 Changes
- Updated to reflect new available Economic Demand Response Parameters (Section 21)
- Dispatch Lambda Clarifications (Section 4.4)
- Electric Gas Coordination Parameter Updates (Section 5.12)
- Minor updates, references, and clarifications

Introduction

The PJM Markets Gateway User Guide provides Market Participants with the information needed to participate in the Day-Ahead Market, Real-Time Market, Regulation Market, and Reserve Markets. It describes the Day-Ahead Market software, the Ancillary Service Market software and the tasks that Market Participants can perform, as well as the expected system responses.

Typical uses of Markets Gateway

PJM Markets Gateway is the system that PJM Market Participants use to participate in the Day-Ahead Energy and Reserve Markets, Real-Time Energy Market, Reserve Markets and Regulation Market. Market Participants can use PJM Markets Gateway, for example, to:

- Prepare and submit generation offers
- Prepare and submit regulation market offers
- Prepare and submit synchronized reserve market offers
- Prepare and submit non-synchronized reserve market offers
- Prepare and submit secondary reserve market offers
- Prepare and submit demand bids
- Prepare and submit increment offers and decrement bids
- Prepare and submit Load Response bids
- Enter bilateral regulation transactions
- Enter bilateral synchronized reserve transactions
- Enter bilateral non-synchronized reserve transactions
- Enter bilateral secondary reserve transactions
- Enter resources adjustable parameters and status intra-day for the Real-Time Energy Market
- Review public and private Day-Ahead Energy and Reserves Markets results
- Review public and private Regulation and Real-Time Reserves Markets results

Interfacing with Markets Gateway

Market Participants have two primary methods of interacting with PJM Markets Gateway. The methods are:

- **Web-based Interactions** — access is provided through a series of web-based interactive displays, which are accessible on the Internet. Section 1 of this User Guide describes the displays.
- **XML-formatted File Exchange** — input and output files that are posted or downloaded, using the market user interface (MUI) or another participant-created application. Section 26 of this User Guide describes how to use the MUI to perform these tasks. Please see the *External Interface Specification Guide* posted on PJM.com under Market & Operations > PJM Tools > Markets Gateway.

Who is this User Guide for?

This PJM Markets Gateway User Guide is for Market Participants who need to use Markets Gateway to perform tasks to interface with the Energy and Ancillary Services Markets, such as:

- View information, such as Day-Ahead binding transmission constraints, Day-Ahead reactive interface limits, Day-Ahead net tie schedules, Day-Ahead demand information, Day-Ahead LMPs, Ancillary Services Markets results and Markets messages
- Manage generation or demand portfolios
- View private generation information
- Manage generator offers
- Manage regulation offers
- Manage Synchronized Reserve offers
- Manage Non-Synchronized Reserve offers
- Manage Secondary Reserve offers
- View private demand information
- Manage demand bids
- Manage Load Response bids
- Download and post XML-files

Knowledge It's Assumed You Have

The PJM Markets Gateway User Guide is written under the assumption that you:

- Understand how PJM's Day-Ahead Market, Real-Time Energy Market and Ancillary Services Markets operate
- Understand how LMPs are calculated
- If you would like additional information about any of these topics, consider referencing the following sources:
 - PJM Manual 11: Energy & Ancillary Service Market Operations Manual
 - PJM Training Courses & Material
 - PJM's Internet site (www.pjm.com)

1.0 PJM Markets Gateway Application

1.1 Markets Gateway Overview

PJM Markets Gateway is designed to make it easy for PJM Market Participants to participate in PJM's Day-Ahead Energy and Reserves Markets, Real-Time Energy Market and Real-Time Regulation and Reserves Markets. Market Participants use PJM Markets Gateway to submit resource energy offers, ancillary services markets offers, demand bids, resource intra-day/intra-hour status and parameter updates in the Day-Ahead, Real-Time and Ancillary Services markets, as well as review the results of the Day-Ahead and Ancillary Services markets.

Prior to accessing Markets Gateway web pages, you must be a registered Markets Gateway user. Depending upon PJM membership status, registered Markets Gateway users can view and/or modify generation information and demand information.

There are two types of information available to the Market Participants and other interested parties: public information and private information, which includes private generation information and private demand information. For more information on the roles that control the ability to view public and private information, please consult the Application Privileges section of this User Guide.

Users will not be able to view any private data within Markets Gateway screens until at least one portfolio is defined that contain their location(s). However, this does not prevent Market Gateway users from utilizing XML to obtain their private data or to submit their offers.

1.2 PJM Markets Gateway Components

The Markets Gateway system has two main components:

- User Interface (UI) – The UI components allow access to both public and private data using one of the PJM supported web browsers.
- Web Services (XML) – The Web Services component allows market participants the ability to exchange data without the use of a web browser. Some of the data exchange functions are the following:
 - Interacting with the energy market by submitting offers of generation supply, ancillary service supply, and submitting bids for demand and virtual (inc/dec) supply and demand
 - Query the market for public and private data.
 - Manage portfolios of generating units or demand bid pricing node location.

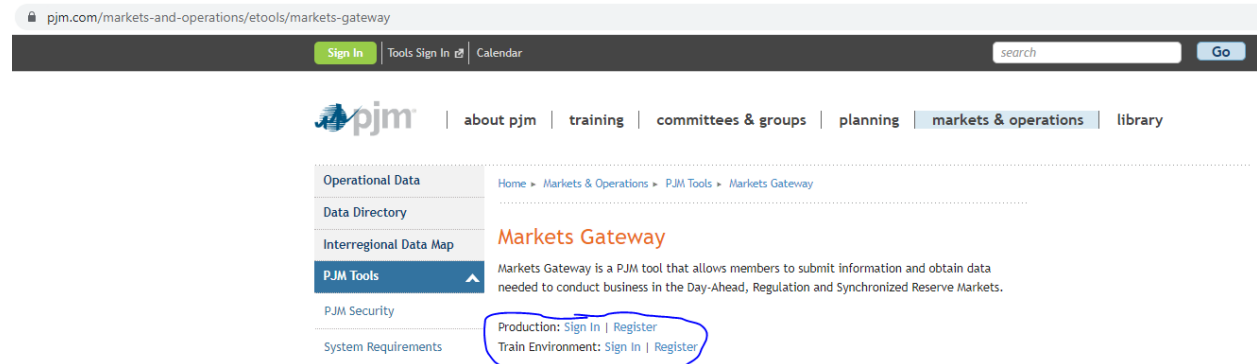
Both of these components follow Market Rules outlined in PJM Manual 11: Energy & Ancillary Service Market Operations.

1.3 Markets Gateway Website

- **Market Participants interface with PJM Markets Gateway via the Market User Interface, or MUI.** The PJM Markets Gateway application is integrated into the PJM Tools environment which allows the user to access various PJM web-based applications via a single username and password. The PJM Tools environment is accessed via Internet facilities. The supported Internet facility list can be found, <https://pjm.com/markets-and-operations/etools/system-requirements>.

1.4 Accessing the PJM Markets Gateway Application

From the Markets Gateway Tools screen (<https://pjm.com/markets-and-operations/etools/markets-gateway>), select the 'Sign In' for either the Production or Train environment as circled below for the Markets Gateway Application.



1.5 Markets Gateway Application Privileges

To access Markets Gateway, Market Participants must have a valid PJM Tools user account. Prior to accessing, the public or the private generation or demand web pages you must be a valid Markets Gateway user with specific privileges. There are several types of Markets Gateway privileges for registered users, including:

- **Generation Read Only** - Users that only view private generation information
- **Generation Read/Write** - Users that submit private generation information, such as generation offers, as well as view private generation information
- **Load Read Only** - Users that only view private demand information
- **Load Read/Write** - Users that submit private demand information, such as demand bids, as well as view private demand information
- **Administrator** - Users that are designated as a Markets Gateway administrator that can set thresholds for fixed demand bids, increment offers and decrement bids.
- **Public Read Only** - Users that are designated as a public Markets Gateway user can view public market results.

These privileges can be set by an individual company's PJM Account Manager.

These privileges can also be set by the individual user by selecting the appropriate privileges on the My Account after the user logs into the Account Manager application.

My Tools ▾
(GEN_RW1) | Sign Out | Contact | Help


Account Manager

User Profile - gen_rw1

Pending Tasks | Add New User | **User Profile** | My Company | Search

Account Information | **Account Access**

Account Access

Below are the companies and tools access that are currently on the account.

Request Access

Company ID	Company	Company Shortname
☒		

Tool	Access Type	Effective Date	Terminate Date	Actions
Account Manager	Read/Write	09/23/2015	12/31/9999	 
Markets Gateway	Generation Read Write	09/14/2015	12/31/9999	 

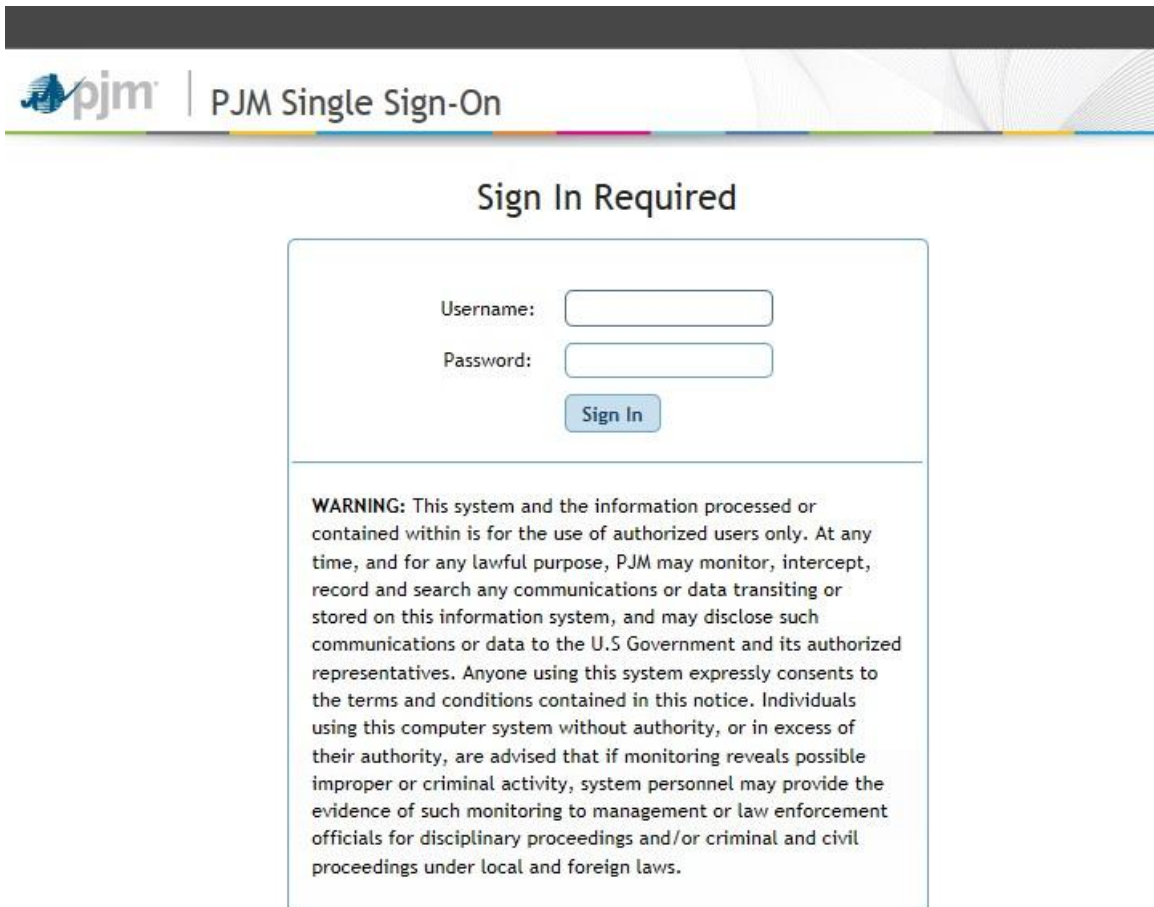
Default Access

Tool	Access Type
Data Miner	API
Member Community	Public
My PJM	Public

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Feedback

Access to the PJM Markets Gateway Application is via Single Sign-On.

Type in your Username and Password. You must login as a qualified user of Markets Gateway.



The image shows a screenshot of the PJM Single Sign-On login interface. At the top, there is a header bar with the PJM logo and the text "PJM Single Sign-On". Below this, the main heading "Sign In Required" is centered. The login form consists of two input fields: "Username:" and "Password:", each followed by a text box. Below these fields is a blue "Sign In" button. A warning box is located below the login fields, containing a "WARNING:" notice about system monitoring and data handling.

Sign In Required

Username:

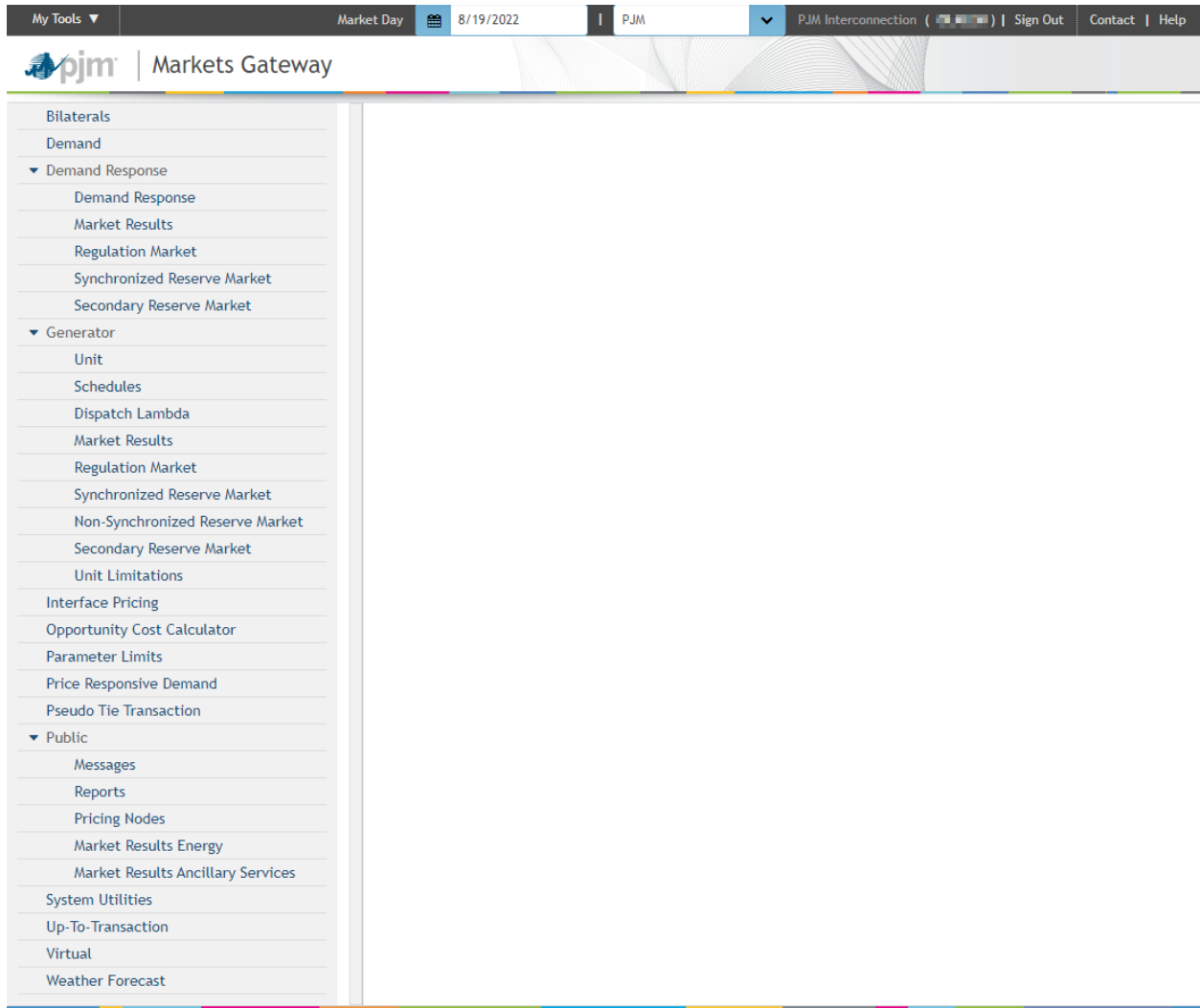
Password:

Sign In

WARNING: This system and the information processed or contained within is for the use of authorized users only. At any time, and for any lawful purpose, PJM may monitor, intercept, record and search any communications or data transiting or stored on this information system, and may disclose such communications or data to the U.S Government and its authorized representatives. Anyone using this system expressly consents to the terms and conditions contained in this notice. Individuals using this computer system without authority, or in excess of their authority, are advised that if monitoring reveals possible improper or criminal activity, system personnel may provide the evidence of such monitoring to management or law enforcement officials for disciplinary proceedings and/or criminal and civil proceedings under local and foreign laws.

1.6 PJM Markets Gateway Navigation

Markets Gateway Navigation — The left side Navigation Menu provides links to all required functionalities. While Markets Gateway includes the same functional areas as were available from the legacy eMKT application left side navigation (as shown in the graphic at the bottom of the page), Markets Gateway has expanded the navigation bar to display submenus and stand-alone selections to facilitate quick and efficient access.

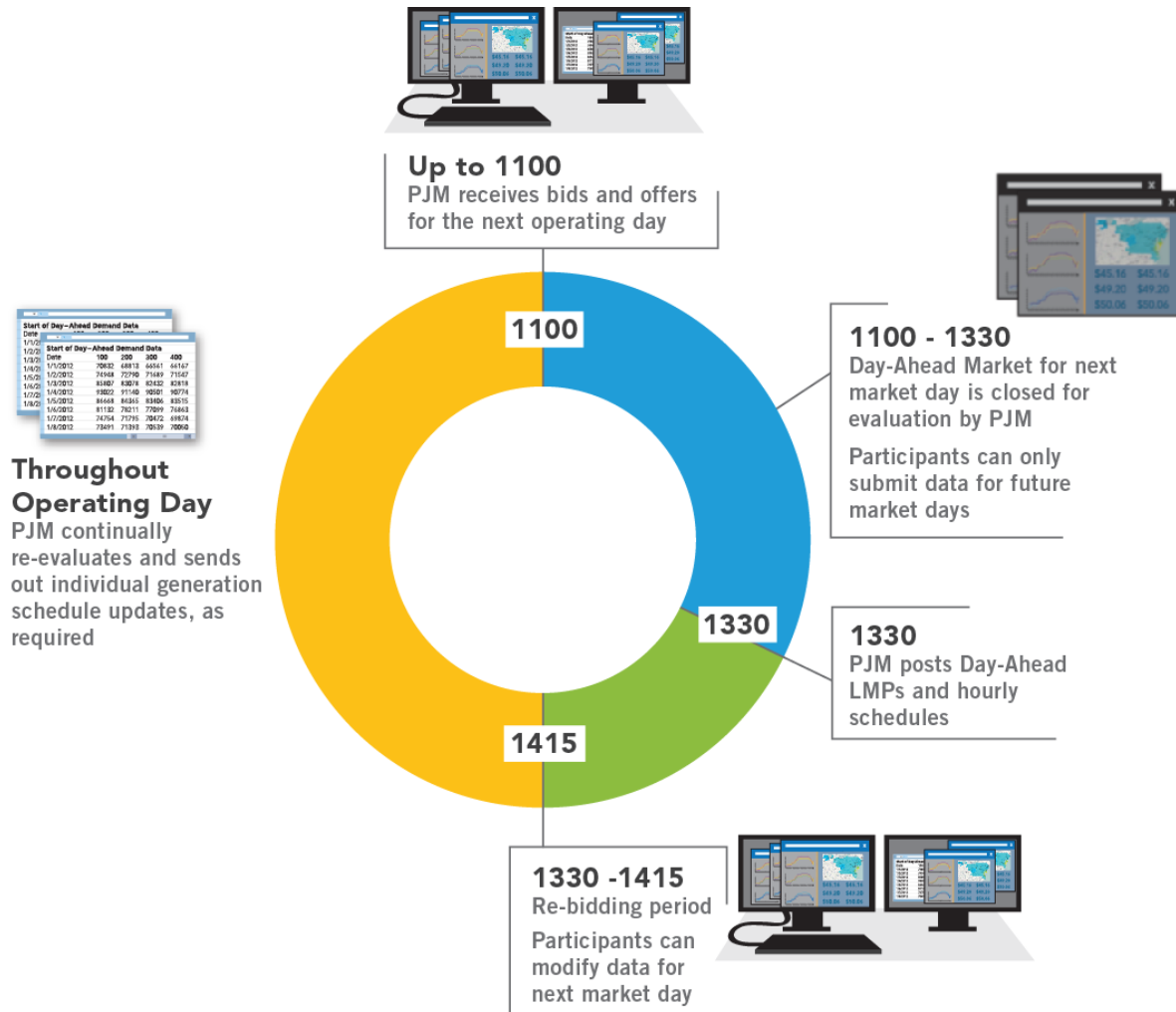


PJM Market Timeline

1.7 Day-Ahead Energy Market Timeline

PJM initiates, directs and oversees the Day-Ahead Energy Market clearing process. The following figure illustrates the important activities for clearing the Day-Ahead Energy Market:

Week Ahead	• Outage Analysis • Load Forecast • Forward Reliability Analysis
Day-Ahead	• Day-Ahead Energy Market • Reliability Analysis • Day-Ahead Reserves Market • Unit Commitment
Real-Time (Operating Day) Hours Ahead Minutes Ahead	• Near-term Reliability Analysis • Regulation Market • Reserves Market • Real-time Energy
Day After Operating Day	• Bilateral Energy and Ancillary Services transactions



The Day-Ahead Market results will be posted as soon as the Day-Ahead case is approved but not before noon. The re-bid period will start as soon as Day-Ahead Market results are posted, but no later than 13:30, and will close at 14:15. If there is cause for a delay in the posting of Day-Ahead Market results, then the re-bid period start and end times can be extended accordingly and participants will be notified of such a change.

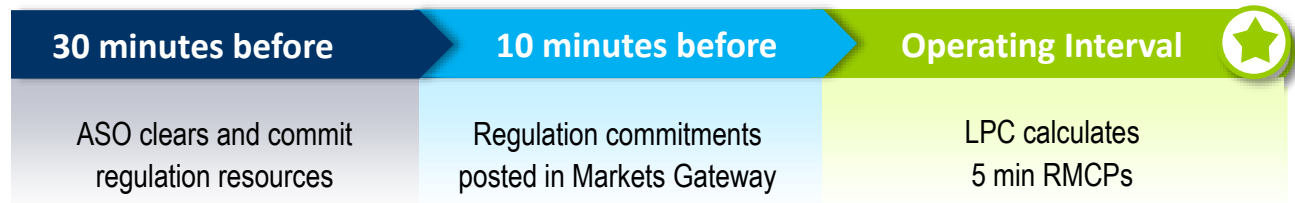
For more information, a complete list of details and business rules of the PJM Day-Ahead Market can be found in ***PJM's Manual 11: Energy & Ancillary Services Market Operations***.

1.8 Ancillary Services Market Timeline

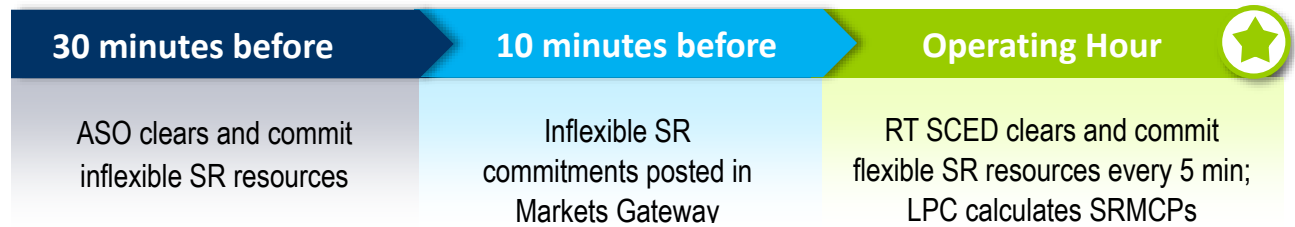
Bidding Period – The Day-ahead reserves daily offers, and hourly differentiated offers can be submitted up until 11:00. The Real-time Regulation and reserves daily offers and hourly differentiated offers can be submitted up until 14:15 the day before the operating day. Updates to the hourly differentiated offers for the Real-time Regulation and inflexible reserve offers for resources opted in to Intraday Offers can be made in Real-time starting at 18:30 the day before the operating day up to 35 minutes prior to the start of the operating hour. Any hourly or interval updates overwrite the daily offers.

Additional parameters can be changed up to 35 minutes prior to the operating interval regardless of whether the resource is opted in or out of Intraday Offers.

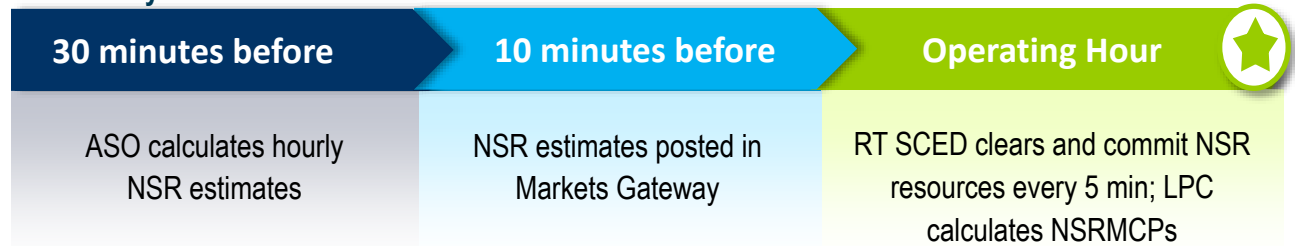
1.9 Regulation



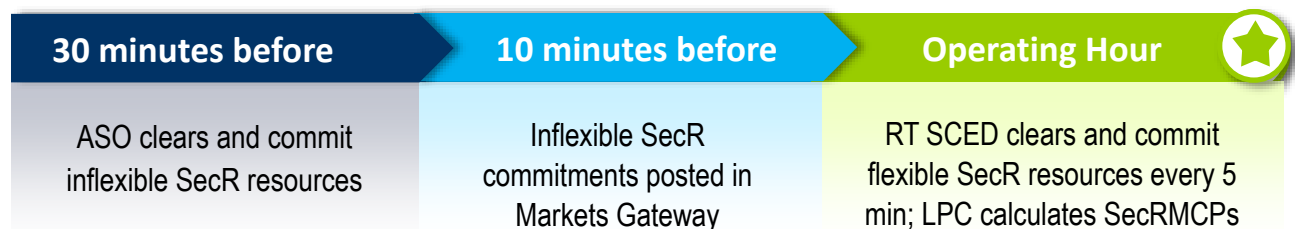
1.10 Synchronized Reserve



1.11 Non-Synchronized Reserve



1.12 Secondary Reserve



For more information, a complete list of details and business rules of the PJM Regulation and Synchronized Reserve Markets can be found in **PJM's Manual 11: Energy & Ancillary Services Market Operations**.

1.13 Historical Data Retention Policy

The data that is submitted into the Markets Gateway system is kept within the system for up to 90 days at which point it is purged out of the Markets Gateway system. It is incumbent upon the Participant / Member to ensure that any records of submitted data are maintained on their end, and not to rely on PJM for maintaining any historical records of submissions beyond this 90-day window.

2.0 Viewing Public Market Results

2.1 Overview

The focus of this section is viewing public Market Result information. Viewing Market Results specific to private generation and demand information is presented in later sections.

Energy Market Results and Ancillary Services Market Results are markets information tabs that are available to anyone that visits the PJM Markets Gateway website. The Market Results Energy page includes Day-Ahead Market prices, Day-Ahead binding transmission constraints, Day-Ahead net tie schedules and Day-Ahead reactive interface limits. The Market Results Ancillary Services page includes Regulation requirement, Regulation procured, and Synchronized Reserve Markets requirements.

Market Results Energy

- **Demand Summary** – Use this web page to view Day-Ahead demand quantities, including total PJM demand bids, PJM's reserve objective and PJM's load forecasts.
- **Market Prices** – Use this web page to view Day-Ahead prices, filtered by a public portfolio.
- **Interface Limits** – Use this web page to view reactive interface limits for the Day-Ahead Market.
- **Net Tie Schedules** – Use this web page to view Day-Ahead PJM tie schedules.
- **Binding Limits** – Use this web page to view binding transmission constraints in the Day-Ahead Market.
- **Reliability Analysis Schedule MW** – Use this web page to view the results of the Reliability Commitment.
- **Day-Ahead Schedule MW** – Use this web page to view the amount of MW scheduled in the Day-Ahead Market and the reason they were scheduled. Reasons would be for reactive logging and are comprised of Reactive Gen Steam, Day-Ahead Reactive Interface and Black Start.

Steps (from the left navigation bar):

Select **Public**

Select **Market Results Energy**

The web pages above will display.

Click on the desired Tab from above.

Market Results Ancillary

- **Regulation Results** – Use this web page to view the results of the Regulation Market.

- **DA Synchronized Reserve Results** – Use this web page to view the results of the Synchronized Reserve Market.
- **RT Synchronized Reserve Results** – Use this web page to view the results of the Synchronized Reserve Market.
- **DA Primary Reserve Results** – Use this web page to view the results of the Day-Ahead Primary Reserve Market.
- **RT Primary Reserve Results** – Use this web page to view the results of the Real-Time Primary Reserve Market.
- **DA 30 Minute Reserve Results** – Use this web page to view the results of the DA 30 Minute Reserve Market.
- **RT 30 Minute Reserve Results** – Use this web page to view the results of the RT 30 Minute Reserve Market.
- **Active Subzone** – Use this web page to view which real-time sub-zones were active during any given hour for the specific reserve markets.

Steps (from the left navigation bar):

Select **Public**

Select **Market Results Ancillary**

The web pages above will display.

Click on the desired Tab from above.

2.2 View Day-Ahead Demand Information

A Markets Gateway user can view demand information, including the total Day-Ahead demand bids, as submitted by Market Participants.

The following demand information is posted for each hour:

- **Day-Ahead Demand** – The total MW value of the fixed demand bids, the cleared price-sensitive demand bids and cleared dec bids for PJM.
- **PJM's Day-Ahead Load Forecast** – PJM's Day-Ahead load forecast, in MW, calculated by PJM for reliability purposes.

Steps (from the left navigation bar):

Select **Public**.

Select **Market Results Energy**.

Select the **Demand Summary** tab.

The Demand Summary web page appears.

Click the Market Day calendar to select the date.

Review the following Day-Ahead demand information:

Day-Ahead Demand

PJM Day-Ahead Load Forecast

To download selected information, click the **XML** or **CSV** report buttons.

The file is downloaded to your specified local directory, or you can open it to view in a separate browser window.

2.3 View Day-Ahead Market Prices

A Markets Gateway user can view the clearing prices for the Day-Ahead market, filtered by a public portfolio. Day-Ahead prices reflect the Day-Ahead energy prices for each hour of the day.

PJM calculates Day-Ahead LMPs for all buses in PJM, creating a challenging data management issue. Portfolios solve the data management problem by grouping price nodes into aggregates. The following portfolios, created by PJM, are available to the public users:

- **Hubs**
- **Zones**
- **Interfaces**
- **Residual**

The following Day-Ahead price information for a portfolio is presented for each hour:

- **Hour** – Hourly values are shown in columns.
- **Location** – A valid PJM price node, which is a bus for which PJM calculates Day-Ahead and Real-Time LMPs.
- **Price** – The Day-Ahead LMP and the Loss Price and Congestion Price components, at the price node, expressed as \$XXXX.XX.

Steps (from the left navigation bar):

Select **Public**.

Select **Market Results Energy**.

Select the **Market Prices** tab.

- *The Market Prices web page appears.*

Click the Market Day calendar to select the date.

Select the desired portfolio name from the Portfolio List.

- *The nodes defined for the selected portfolio appear.*

Review the following Day-Ahead price data with respect to the selected portfolio for each hour:

- *Hour*
- *Location*
- *Price (\$/MW), included Day-Ahead LMP, Day-Ahead Loss Price and Day-Ahead Congestion Price*

To download selected information, click the **XML** or **CSV** report buttons.

The file is downloaded to your specified local directory, or you can open it to view in a separate browser window.

2.4 View Day-Ahead Binding Constraints

Binding Constraints that are encountered during the Day-Ahead Market are presented on the Binding Limits web page. For each binding constraint the following information is posted for the date selected:

Monitored Facility – The facility for which its limits are violated under normal or contingency conditions. The monitored facility appears in the Type column.

Actual or Contingency – The facility for which its outage would cause a monitored facility violation. The actual and contingencies are listed below the Monitored Facility.

Hours – The hours during which the binding constraint exists during the Day-Ahead Market. These are indicated by a price value in any hour column.

Steps (from the left navigation bar):

Select **Public**.

Select **Market Results Energy**.

Select the **Binding Limits** tab.

- *The Binding Limits web page appears.*

Click the Market Day calendar to select the date.

Review the following Day-Ahead binding constraint information for the market day:

- Monitored Facility
- Actual or Contingency
- Hours

To download selected information, click the **XML** or **CSV** report buttons.

The file is downloaded to your specified local directory, or you can open it to view in a separate browser window.

2.5 View Day-Ahead Reactive Interface Limits

Reactive interface limits for the Day-Ahead Market are calculated and presented on the Interface Limits web page. Reactive interface limits constrain the amount of energy that can be imported from Western portions of PJM. Reactive Interface limits are pre-contingency MW flow limitations across an interface to protect the system from large voltage drops caused by a viable contingency.

Each interface consists of a number of 500 kV lines. Reactive interface limits for the Day-Ahead Market are posted for the following interfaces: **APSOUTH**, **BCPEP**, **BED-BLA**, **CENTRAL**, **EAST** and **WEST**:

The Type column indicates the interface reported.

For each hour in the Day-Ahead Market, the following information is presented:

- **Operating Limit** – MW transfer beyond which reactive and voltage criteria limits are violated.
- **Actual Flow** – Actual MW flow on each transfer interface. If the actual flow is greater than the operating limit, the value appears in red.

Steps (from the left navigation bar):

Select **Public**.

Select **Market Results Energy**.

Select the **Interface Limits** tab.

- *The Interface Limits web page appears.*

Click the Market Day calendar to select the date.

- *The Operating Day's Day-Ahead actual flows and operating limits appear for the selected date.*

Review the following Day-Ahead reactive interface information for each hour:

- Operating Limit
- Actual Flow

To download selected information, click the **XML** or **CSV** report buttons.

The file is downloaded to your specified local directory, or you can open it to view in a separate browser window.

2.6 View Day-Ahead Net Tie Schedules

PJM posts the Day-Ahead net tie schedules for each of its interfaces and the PJM total. A positive value indicates a flow into PJM; a negative value indicates a flow out of PJM.

This page displays the interface flows for all interfaces of PJM. This page also displays the total net flow into or out of PJM:

Steps (from the left navigation bar):

Select **Public**.

Select **Market Results Energy**.

Select the **Net Tie Schedules** tab.

The Net Tie Schedules web page appears.

Click the Market Day calendar to select the date.

Click the **Refresh** button.

The Operating Day's Day-Ahead net tie schedules appear for the selected date.

Review the following net tie schedules for each interface for each hour.

To download selected information, click the **XML** or **CSV** report buttons.

The file is downloaded to your specified local directory, or you can open it to view in a separate browser window.

2.7 View Day-Ahead Reliability Analysis Schedule MW

This page displays the results of the Reliability Assessment Commitment and the reason for the commitment. The Reason column specifies the reason for the reliability assessment commitment for the number of MW that were scheduled. The Econ. Max. Total column specifies the number of MW scheduled for the associated reason by reliability assessment. **Steps (from the left navigation bar):**

Select **Public**.

Select **Market Results Energy**.

Select the **Reliability Analysis Schedule MW** tab.

The Reliability Analysis Schedule MW web page appears.

Click the Market Day calendar to select the date.

Click the **Refresh** button.

The Operating Day's Reliability Analysis Schedule MW appears for the selected date.

Review the following Reliability Analysis Schedule MW information for the market day:

- Reason
- Econ. Max. Total

To download selected information, click the **XML** or **CSV** report buttons.

The file is downloaded to your specified local directory, or you can open it to view in a separate browser window.

2.8 View Day-Ahead Schedule MW

This page displays the amount of MW scheduled in the Day-Ahead Market and the reason they were scheduled. Reasons would be for reactive logging and are comprised of Reactive Gen Steam, Day-Ahead Reactive Interface, and Black Start. **Steps (from the left navigation bar):**

Select **Public**.

Select **Market Results Energy**.

Select the **Day-Ahead Schedule MW** tab.

The Day-Ahead Schedule MW web page appears.

Click the Market Day calendar to select the date.

Click the **Refresh** button. *The Operating Day's Day-Ahead Schedule MW appears for the selected date.*

Review the following Day-Ahead Schedule MW information for the market day:

- Reason
- Econ. Max. Total

To download selected information, click the **XML** or **CSV** report buttons.

The file is downloaded to your specified local directory, or you can open it to view in a separate browser window.

2.9 View Regulation Market Clearing Results

A public user can view the Regulation Market clearing results for the single product/signal Regulation Market.

Regulation Results for Date/Area

The following Regulation Market results information is posted per half-hour operating interval:

Requirement – The total required amount of generation energy that is synchronized to the grid and is able to increase or decrease its output in response to a regulating control signal within five minutes adjusted by effective MWs.

Reg. Self Scheduled Effective MW – Self-scheduled regulation performance adjusted market capability.

Reg. Procured Effective MW – Total procured regulation performance adjusted capability.

Total – Total Self Scheduled Regulation capability and Procured Regulation capability.

Deficiency – Regulation Market deficiency.

RTO Avg Performance Score – The average performance score of all regulating resources for the market interval.

Reg. Mileage – 30-day average of $\Delta MW/MW$ for an ideal resource following Reg signal.

Steps (from the left navigation bar):

Select **Public**.

Select **Market Results Ancillary Services**.

Select the **Regulation Results** tab.

The Regulation Results web page appears.

Click the Market Day calendar to select the date.

Click the **Refresh** button.

The regulation results appear for the selected date.

Review the following Regulation Market results for each hour:

- Interval
- Requirement
- Reg. Self Scheduled Effective MW
- Reg. Procured Effective MW
- Total
- Deficiency
- RTO Avg Performance Score
- Reg. Mileage

To download selected information, click the **XML** or **CSV** report buttons.

The file is downloaded to your specified local directory, or you can open it to view in a separate browser window.

If there is no Regulation Market Assigned MW posted to Markets Gateway for an operating interval, PJM will continue with assignments from the last approved interval before the next missing interval, adjusting as needed. The Real-time five-minute integrated Regulation Market Clearing Price (RMCP) will be used for settlements. If the solution for an interval is not posted, data will not be back populated on the public results page at a future date or time.

2.10 View DA Synchronized Reserve Market Clearing Results

A Markets Gateway user can view the Day-Ahead Synchronized Reserve Market clearing results. The following Day-Ahead Synchronized Reserve Market results information is posted:

Area – The zone/subzone in which the reserve results occurred.

Requirement – The total required amount of 10-minute reserve that must be synchronized to the grid.

SRMCP – Synchronized Reserve Market Clearing Price.

Avail. Transfer – MW available for transfer from the RTO to the Subzone area.

Self Scheduled – Self Scheduled Synchronized Reserve Market MW capacity.

Assigned – Assigned Synchronized Reserve Market MW capability.

Total – Total Amount of Synchronized Reserve capability, Self Scheduled Synchronized Reserve capability and Assigned Synchronized Reserve capability.

Deficiency – Synchronized Reserve Market deficiency

Steps (from the left navigation bar):

Select **Public**.

Select **Market Results Ancillary Services**.

Select the **DA Synchronized Reserve Results** tab.

The DA Synchronized Reserve Results web page appears.

Select the desired reserve zone/subzone from the Area drop-down.

Click the Market Day calendar to select the date.

Click the **Refresh** button.

The day-ahead synchronized reserve results appear for the selected date.

Review the following DA Synchronized Reserve market results for each hour:

- Hour
- Area
- Requirement
- SRMCP
- Avail. Transfer
- Self Scheduled
- Assigned
- Total
- Deficiency

To download selected information, click the **XML** or **CSV** report buttons.

The file is downloaded to your specified local directory, or you can open it to view in a separate browser window.

2.11 View RT Synchronized Reserve Market Clearing Results

A Markets Gateway user can view the Real-Time Synchronized Reserve Market clearing estimates. The following Real-Time Synchronized Reserve Market clearing results information is posted:

Area – The zone/subzone in which the reserve results occurred.

Requirement – The total required amount of 10-minute reserve that must be synchronized to the grid.

Avail. Transfer Preliminary – Estimated MW's available for transfer from the RTO to the Subzone area.

Self Scheduled – Self Scheduled Synchronized Reserve Market MW estimate.

Assigned Preliminary – Assigned Synchronized Reserve Market MW estimate.

Total Preliminary – Total Amount of Synchronized Reserve estimated, Self Scheduled Synchronized Reserve estimated, and Assigned Synchronized Reserve estimated.

Deficiency Preliminary – The estimated Synchronized Reserve Market deficiency

Steps (from the left navigation bar):

Select **Public**.

Select **Market Results Ancillary Services**.

Select the **RT Synchronized Reserve Results** tab.

The RT Synchronized Reserve Results web page appears.

Select the desired reserve zone/subzone from the Area drop down.

Click the Market Day calendar to select the date.

Click the **Refresh** button.

The real-time synchronized reserve results appear for the selected date.

Review the following RT Synchronized Reserve market results for each hour:

- Hour
- Area
- Requirement
- Avail. Transfer Preliminary
- Self Scheduled
- Assigned Preliminary
- Total Preliminary
- Deficiency Preliminary

To download selected information, click the **XML** or **CSV** report buttons.

The file is downloaded to your specified local directory, or you can open it to view in a separate browser window.

2.12 View DA Primary Reserve Market Clearing Results

A Markets Gateway user can view the Day-Ahead Primary Reserve assignments.

The following Primary Reserve estimates information is posted:

Area - The zone/subzone in which the reserve results occurred.

Requirement – The total required amount of 10-minute reserve that can be obtained from SR or NSR resources.

SR MCP – Synchronized Reserve Market Clearing Price for the hour and subzone.

PR MCP – Primary Reserve Market Clearing Price for the hour and subzone.

Avail. Transfer – MW available for transfer from the RTO to the Subzone area.

SR Self Scheduled – Amount of Synchronized Reserve MW's that were self-scheduled and available within the next 10 minutes.

SR Assigned – Amount of Synchronized Reserve MW's that were assigned and available within 10 minutes.

NSR Assigned – MWs of resources not electrically synchronized to the grid, but will be available within 10 minutes.

Total – Total Amount of Synchronized Reserve capability, which is the total amount Synchronized Reserve Self Scheduled, Synchronized Reserve Self Assigned, and Non-Synchronized Reserve Self Assigned.

Deficiency – Day-Ahead Primary Reserve deficiency

Steps (from the left navigation bar):

Select **Public**.

Select **Market Results Ancillary Services**.

Select the **DA Primary Reserve Results** tab.

The Day-Ahead Primary Reserve Results web page appears.

Select the desired reserve zone/subzone from the Area drop-down.

Click the Market Day calendar to select the date.

Click the **Refresh** button.

The day-ahead primary reserve results appear for the selected date.

Review the following Day-Ahead Primary Reserve market results for each hour:

- Hour
- Area
- Requirement
- SR MCP
- PR MCP
- Avail. Transfer
- SR Self Scheduled
- SR Assigned

- NSR Assigned
- Total
- Deficiency

To download selected information, click the **XML** or **CSV** report buttons.

The file is downloaded to your specified local directory, or you can open it to view in a separate browser window.

2.13 View RT Primary Reserve Market Clearing Results

A Markets Gateway user can view the Real-Time Primary Reserve estimates.

The following Real-Time Primary Reserve estimates information is posted:

Area - The zone/subzone in which the reserve results occurred.

Requirement – The total required amount of 10-minute reserve that can be obtained from SR or NSR resources.

Avail. Transfer Preliminary – MW available for transfer from the RTO to the Subzone area.

SR Self Scheduled – Amount of Primary Reserve MW's that were self-scheduled and available within the next 10 minutes.

SR Assigned Preliminary – Amount of Synchronized Reserve MW's that are available within the next 10 minutes.

NSR Assigned Preliminary – MWs of resources not electrically synchronized to the grid, but will be available within 10 minutes.

Total Preliminary – Total Amount of Synchronized Reserve capability, which is the total amount Synchronized Reserve Self Scheduled, Synchronized Reserve Self Assigned, and Non-Synchronized Reserve Self Assigned.

Deficiency Preliminary – Real Time Primary Reserve deficiency.

Steps (from the left navigation bar):

Select **Public**.

Select **Market Results Ancillary Services**.

Select the **RT Primary Reserve Results** tab.

The RT Primary Reserve Results web page appears.

Select the desired reserve zone/subzone from the Area drop-down.

Click the Market Day calendar to select the date.

Click the **Refresh** button.

The real-time primary reserve results appear for the selected date.

Review the following Real-Time Primary Reserve market results for each hour:

- Hour
- Area
- Requirement

- Avail. Transfer Preliminary
- SR Self-Scheduled
- SR Assigned Preliminary
- NSR Assigned Preliminary
- Total Preliminary
- Deficiency Preliminary

To download selected information, click the **XML** or **CSV** report buttons.

The file is downloaded to your specified local directory, or you can open it to view in a separate browser window.

2.14 View DA 30 Minute Reserve Market Clearing Results

A Markets Gateway user can view the Day-Ahead 30 Minute Reserve Market Clearing results.

The following Day-Ahead 30 Minute Reserve Market Clearing results are posted:

Area - The zone/subzone in which the reserve results occurred.

Requirement – The total required amount of 30-minute reserve that must be synchronized to the grid.

SR MCP – The Synchronized Reserve Market Clearing Price.

PR MCP – The Primary Reserve Market Clearing Price.

30 Minute MCP – The 30 Minute Market Clearing Price.

Avail. Transfer – MW available for transfer from the RTO to the Subzone area.

SR Self Scheduled – Amount of Synchronized Reserve MW's that were self-scheduled and available within the next 30 minutes.

SR Assigned – Amount of Synchronized Reserve MW's that are available within 30 minutes.

NSR Assigned – MWs of resources not electrically synchronized to the grid, but can be available within 30 minutes.

Secondary Assigned – Amount of Secondary Reserve MW's that are available within 30 minutes.

Total – Total Amount of: SR Self Scheduled, SR Assigned, NSR Assigned and Secondary Assigned.

Deficiency – 30 Minute Reserve deficiency

Steps (from the left navigation bar):

Select **Public**.

Select **Market Results Ancillary Services**.

Select the **DA 30 Minute Reserve Results** tab.

The DA 30 Minute Reserve Results web page appears.

Select the desired reserve zone/subzone from the Area drop-down.

Click the Market Day calendar to select the date.

Click the **Refresh** button.

The Day-Ahead 30-minute reserve results appear for the selected date.

Review the following Day-Ahead 30-minute reserve market results for each hour:

- Hour
- Area
- Requirement
- SR MCP
- PR MCP
- 30 Minute MCP
- Avail. Transfer
- SR Self Scheduled
- SR Assigned
- NSR Assigned
- Secondary Assigned
- Total
- Deficiency

To download selected information, click the **XML** or **CSV** report buttons.

The file is downloaded to your specified local directory, or you can open it to view in a separate browser window.

2.15 View RT 30 Minute Reserve Market Clearing Results

A Markets Gateway user can view the Real-Time 30 Minute Reserve estimates. T

The following Real-Time 30 Minute Reserve estimates information is posted:

Area - The zone/subzone in which the reserve results occurred.

Requirement – The total required amount of 30-minute reserve that must be synchronized to the grid.

Avail. Transfer Preliminary – The estimated MW's available for transfer from the RTO to the Subzone area.

SR Self Scheduled – Amount of Synchronized Reserve MW's that were self-scheduled and available within the next 30 minutes.

SR Assigned Preliminary – Amount of Synchronized Reserve MW's that are estimated to be available within 30 minutes.

NSR Assigned Preliminary – MWs of resources not electrically synchronized to the grid, but are estimated to be available within 30 minutes.

Secondary Assigned Preliminary – Amount of Secondary Reserve MW's that are estimated to be available within 30 minutes.

Total Preliminary – Total estimated Amount of: SR Self Scheduled, SR Assigned, NSR Assigned and Secondary Assigned.

Deficiency Preliminary – 30 Minute estimated Reserve deficiency.

Steps (from the left navigation bar):

Select **Public**.

Select **Market Results Ancillary Services**.

Select the **RT 30 Minute Reserve Results** tab.

The RT 30 Minute Reserve Results web page appears.

Select the desired reserve zone/subzone from the Area drop-down.

Click the Market Day calendar to select the date.

Click the **Refresh** button.

The real-time 30-minute reserve results appear for the selected date.

Review the following Real-Time 30 Minute Reserve market results for each hour:

- Hour
- Area
- Requirement
- Avail. Transfer Preliminary
- SR Self-Scheduled
- SR Assigned Preliminary
- NSR Assigned Preliminary
- Secondary Assigned Preliminary
- Total Preliminary
- Deficiency Preliminary

To download selected information, click the **XML** or **CSV** report buttons.

The file is downloaded to your specified local directory, or you can open it to view in a separate browser window.

2.17 View Active Subzone

A Markets Gateway user can view the zones that were Active during any given hour and for which Reserve Markets.

The following Active Subzone information is posted:

Active Subzone – The sub-zone that was active during the Hour.

SR – Indicator whether there were any Synchronized Reserves for the hour in that sub zone.

PR – Indicator whether there were any Primary Reserves for the hour in that sub zone.

30MIN – Indicator whether there were any 30 Minute Reserves for the hour in that sub zone.

Steps (from the left navigation bar):

Select **Public**.

Select **Market Results Ancillary Services**.

Select the **Active Subzone** tab.

The Active Subzone web page appears.

Click the Market Day calendar to select the date.

Click the **Refresh** button.

The Active Subzone data appear for the selected date.

Review the following Active Subzone data for each hour:

- Hour
- Active Subzone
- SR
- PR
- 30MIN

To download selected information, click the **XML** or **CSV** report buttons.

The file is downloaded to your specified local directory, or you can open it to view in a separate browser window.

3.0 Managing Generation Portfolios

3.1 Generation Portfolio Overview

Some generation owners submit generation offers for over 30 generating units. Managing this volume of data can be challenging. Generation portfolios are a method of managing these large amounts of data by enabling Market Participants to screen generating unit information so that only generating units of interest are displayed.

A generation portfolio is a collection of generating units that are defined by each generation user. The generation user assigns a unique name to each portfolio when it is created. There is currently no limit to the number of generation portfolios a generation user can create; nor is there a limit to the number of generating units that can be "assigned" to a portfolio. The same generating unit can be assigned to more than one portfolio.

You may want to consider the following information when defining generation portfolios:

- Generating units that are similar types of units (i.e., steam, nuclear, combined cycle, CT)
- Generating units that have similar physical characteristics (i.e., regulating capability, condensing capability)
- Generating units that are physically located in the same geographic area.

3.2 Which Web Pages Do I Use?

Generation users use the following web page to manage generation portfolios:

System Utilities -> Portfolios – Used to view existing generation portfolios and to create, update and delete generation portfolios.

3.3 View Existing Generation Portfolios

There are 2 methods by which you can view generators that comprise a Portfolio. The first method is from the Portfolios screen itself, and the second method is from any of the Generator screens. Both methods are described below:

3.3.1 View Existing Generation Portfolios using Portfolios screen:

Steps (from the left navigation bar):

1. Navigate to the "System Utilities -> Portfolios" screen
2. Select the desired portfolio in the left "Portfolios" pane.

The list of resources assigned to the Portfolio will then display in the middle "Portfolio's Locations" pane which will display the resources assigned to the portfolio along with the resource type such as 'Generator, Demand'

3.3.2 View Existing Generation Portfolios using any Generator screen:

Steps (from the left navigation bar):

1. Select the "Generator" menu option.
2. Select the desired page such as the "Unit -> Hourly Updates"
3. Select the desired portfolio from the "Portfolio" drop-down menu option
4. Select the "Location" drop-down to obtain the list of generators contained within the selected portfolio.

Note: Data is filtered by portfolio and by the selected generator on all of the Generator web pages.

3.4 Create New Generation Portfolios

There is currently no limit to the number of portfolios that a generation user can create. After creating a new generation portfolio, the generation user can view other web pages and filter the data by applying one of the user-defined portfolios.

The generation user enters the following data when creating a new generation portfolio:

Portfolio – The name of the generation portfolio, which is a collection of generating units defined by the generation user. Portfolios can be used by Market Participants to filter the data presented on the web pages to show only subsets of the generating units for which the user is responsible for submitting data.

Location – The abbreviated name of the generating unit. This label appears in the Units Selector List on the Generation web pages.

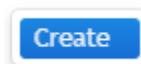
Steps (from the left navigation bar):

1. Select **System Utilities**.
2. Select the **Portfolios** tab.

The Portfolios web page appears.

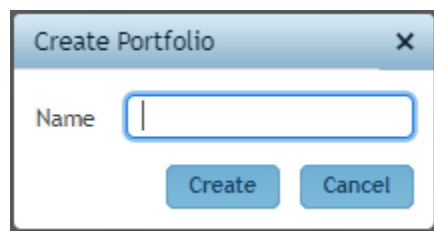
Note that 3 columns will display: "Portfolios", "Portfolio's Location", and "Participant's Available Locations".

3. Right-click anywhere within the *Portfolios* pane and you should see the following:



click the **Create** button.

The "Create Portfolio" pop-up text box displays as shown below:



4. Type in the new portfolio's name in the Name field and press the "Create" button. The new Portfolio will now appear in red within the "Portfolio" pane.
5. Click on the newly added Portfolio.
6. Proceed to Step 5 of the next set of Steps to Add Generating Unit(s) to the Generation Portfolio.

Note: *You will not be able to save a Portfolio that has not had any locations added to it.*

3.5 Add Generating Unit to Generation Portfolio

A generation user can add generating units to existing generation portfolios. There is currently no limit to the number of generating units that can be assigned to a portfolio. A generating unit can be assigned to more than one generation portfolio.

Steps (from the left navigation bar):

1. Select **System Utilities**.
2. Select the **Portfolios** tab.

The Portfolios web page appears.

Note that 3 columns will display: "Portfolios", "Portfolio's Locations", and "Participant's Available Locations".

3. Locate the Portfolio to which a new location is to be added.
4. Click on the row containing the name of the Portfolio to add locations.
5. Select one or more locations from the "Participant's Available Locations" right pane. You can type within the empty text boxes as shown below and then press enter to filter the data to make the selection of locations simpler.

Locations can be found by using the vertical scroll bar or the filter boxes at the top of the columns within the "Participant's Available Locations" pane.

Example of filtering by Generator:

Participant's Available Locations

Id	Name	Type
		Gener

6. Locate the block of 4 single and double arrow buttons adjacent and to the left of the Locations pane.
7. Click on the left arrow button to add the location(s) to the Portfolio.



The selected Location appears in the center set of columns containing the "Portfolio's Locations". The "<<" button will add all locations from the "Participants Available Locations" list into the "Portfolio Locations" list.

8. Repeat the row selection and addition for as many Locations are to be included in the Portfolio.
9. Click the **Save** button to retain the Portfolio with its new Location(s).

"Success: Save successful" message is displayed. The newly added portfolio will then be auto sorted in the left pane and therefore may no longer be at the bottom of the list of portfolios.
10. Click on the Portfolio in the left pane to view the newly added locations.

3.6 Delete a Generation Portfolio

A generation user can delete an entire generation portfolio or a generating unit within a portfolio.

Steps (from the left navigation bar):

1. Select **System Utilities**.
2. Select the **Portfolios** tab.
The Portfolios web page appears.
3. Right click on the desired portfolio to delete
4. Select the **Remove** option to delete the selected portfolio.
5. A pop-up will appear asking if you are sure that you want to Remove the portfolio.
6. Select the **Remove** button to confirm the delete.
7. Click the Save button to commit the deletion of the portfolio or click Refresh to retain the portfolio.

"Success: Save successful" message is displayed.

3.7 Delete a Unit from a Generation Portfolio

A generation user can remove a generating unit from a defined generation portfolio.

Steps (from the left navigation bar):

1. Select **System Utilities**.
2. Select the **Portfolios** tab.
The Portfolios web page appears.
3. Select and click the portfolio's name in the Portfolio field.
The row will become highlighted.
4. Select a generating unit by selecting one or more location in the center column.
The row color will become highlighted.
5. Locate the block of 4 single and double arrow buttons adjacent and to the right of the "Portfolio Locations" list.
6. Click on the right arrow button to remove a location from the Portfolio.



If you click on the >> right arrows it will remove all of the locations from the "Portfolio Locations" list.

7. Click the **Save** button to confirm the removal of the location from the Portfolio.

The Save Successful message displays. The row will disappear, and the generating unit is removed from the portfolio.

8. Select the **Refresh** button to verify modifications.

4.0 Viewing Private Generation Information

4.1 Private Generation Information Overview

There are three types of information available to Market Participants and other interested users:

- Private generation information
- Private demand information
- Public information

Private generation information includes Day-Ahead generation schedules and Day-Ahead LMPs for generating units under the control of the participant and private generation messages.

4.2 Which Web Pages Do I Use?

The following web pages are used to view private generation information:

Generator Market Results — Use this web page to view the Day-Ahead generation schedules for each generating unit, as well as the Day-Ahead LMPs.

4.3 View Day-Ahead Generation Awards

A generation user can view the results of the Day-Ahead market for each generating unit under their control. The Day-Ahead generation information includes the generating unit schedules for each unit committed to run and the LMPs for each hour in the Day-Ahead market.

The following generation information is presented for each generating unit included in the selected generation portfolio:

Location/Schedule – The name of the generating unit, as well as the generating unit's schedule that was selected to run. If the unit is not scheduled to run during the Day-Ahead market, then the schedule field presents "No Schedule Committed".

***** Each hourly column contains a MW@Price pair, or the column is blank if there were no results for the location/schedule for that hour. *****

MW – The MW output schedule for the generating unit for each hour. If there is no MW output, the field is blank. (Any cleared increment offers, or decrement bids are reflected on the Demand by Portfolio web page.).

Price – The \$/MW Day-Ahead LMP for the generating unit for each hour. If there is no MW output, the field is blank.

Total Portfolio MW – The total MW scheduled for each hour for the units in the portfolio that is currently being viewed.

Steps (from the left navigation bar):

1. Select **Generator**.
2. Select **Market Results**.
3. Select the **DA Energy Award** tab.

The Generator->DA Energy Award web page appears.

4. Select the desired portfolio from the Portfolio List.

The list of generating units included in the selected portfolio appears in the Location List.

5. Select the desired location from the Location List.

6. Click the Market Day calendar to select the date.
7. Click the **Refresh** button.
The selected Operating Day's Day-Ahead generation schedules & LMPs will appear.
8. Review the following information for each generating unit in the portfolio for each hour:
 - Location/Schedule
 - MWs
 - Prices
 - Total Portfolio MW

To download selected information, click the **XML** or **CSV** report buttons.

The file is downloaded to your specified local directory, or you can open it to view in a separate browser window.

4.4 View Lambda Generation Details

A generation user can view their live Lambda generation details for the current day for each generating unit under their control on the "Dispatch Lambda" page. Data is displayed and updated on this page upon each RT SCED case approval by PJM Dispatch. As a result, data may become stale in the event PJM Dispatch is "OFF SCED" as defined in Manual 11, Section 2.10.

The following generation information is presented for each generating unit included in the selected generation portfolio:

Location – The name of the generating unit

Schedule – The generating unit's schedule that was selected to run.

Schedule Type – The generating unit's schedule type that was selected to run (e.g. price, cost, pls)

Lambda – The dispatch rate for the zone or unit

Gen. MW – The desired MW basepoint for the unit

Non-Ramp MW – The MW amount, of non-ramp lambda generation

Reg. MW – The MW amount that the unit is regulating.

Deviation MW – The MW deviation; or the deviation between the current generation from the desired generation

Econ. Min. – The minimum energy associated with lambda generation.

Econ. Max. – The maximum capacity energy associated with lambda.

Capacity Max. – The maximum capacity MW associated with lambda Generation

SR Assignment – The Synchronized Reserve Market MW

SecR Assignment – The Secondary Reserve Market MW

On Time – The time (EPT) that a unit is called on or requested online.

Off Time – The time (EPT) that a unit is called off or released.

Status – The reason for lambda generation

Steps (from the left navigation bar):

1. Select **Generator**.
2. Select **Dispatch Lambda**.
The Dispatch Lambda web page appears.
3. Select the desired portfolio from the Portfolio List.
4. Review the following information for each generating unit:
 - Location
 - Schedule
 - Schedule Type
 - Lambda
 - Gen. MW
 - Non-Ramp MW
 - Reg. MW
 - Deviation MW
 - Econ. Min.
 - Econ. Max.
 - Capacity Max.
 - SR Assignment
 - SecR Assignment
 - On Time
 - Off Time
 - Status

To download selected information, click the **XML** or **CSV** report buttons.

The file is downloaded to your specified local directory, or you can open it to view in a separate browser window.

4.5 View Regulation Award

A generation user can view the Regulation award details for the current day for each generating unit under their control per half hour operating interval.

The following generation information is presented for each generating unit included in the selected generation portfolio:

Location -- The name of the generating unit.

Reg. Offer MW – The validated megawatt capability used in clearing. After the validations performed on capability as described in Manual 11, Section 3.2.6, this value may be less than the participant submitted Offer MW.

Self-Schedule MW – The amount cleared for Regulation as self-scheduled MW.

Reg Awarded MW – The amount of cleared Reg.MW.

TPS Result – Result of the Regulation three pivotal supplier test. A failed test result does not prevent resource clearing.

Reg Price Offer Used – The regulation offer, determined by TPS testing, used for regulation market clearing, see Manual 11, Section 3.2.4.3.

Performance Score – The actual regulation performance score based on precision of the resource's response to the regulation signal for the operating interval. See Manual 12, Section 4.4.6 for details. This value will be populated for all intervals with cleared Regulation MWs even if Market Results are missing for that interval.

Steps (from the left navigation bar):

1. Select **Generator**.
2. Select **Market Results**.
3. Select the **Regulation Award** tab.
The Regulation Award web page appears.
4. Select the desired portfolio from the Portfolio List.
The list of generating units included in the selected portfolio appears in the Location List.
5. Select the desired location from the Location List.
6. Select the desired interval from the Interval List.
7. Click the Market Day calendar to select the date.
8. Click the **Refresh** button.
9. Review the following information for each generating unit:
 - Location
 - Reg Offer MW
 - Self-Schedule MW
 - Reg Awarded MW
 - TPS Result
 - Reg Price Offer Used
 - Performance Score

To download selected information, click the **XML** or **CSV** report buttons.

The file is downloaded to your specified local directory, or you can open it to view in a separate browser window.

4.6 View DA Synchronized Reserve Award

A generation user can view the Day-Ahead Synchronized Reserve award details for the approved market day for each generating unit under their control.

The following generation information is presented for each generating unit included in the selected generation portfolio:

Location -- The name of the generating unit.

Area -- The zone/subzone where the unit was awarded Synchronized Reserve MW's.

Offer MW -- The amount of offered Synchronized Reserve MW's for the unit.

Self-Scheduled MW -- The amount cleared for Synchronized Reserve as self-scheduled MW's.

Awarded MW -- The amount of cleared Synchronized Reserve MW's.

Steps (from the left navigation bar):

- Select **Generator**.
- Select **Market Results**.
- Select the **DA Synchronized Reserve Award** tab.
The DA Synchronized Reserve Award web page appears.
- Select the desired portfolio from the Portfolio List.
The list of generating units included in the selected portfolio appears in the Location List.
- Select the desired location from the Location List.
- Select the desired hour from the Hour List.
- Click the Market Day calendar to select the date.
- Click the **Refresh** button.
- Review the following information for each generating unit:
 - Location
 - Area
 - Offer MW
 - Self-Scheduled MW
 - Awarded MW

To download selected information, click the **XML** or **CSV** report buttons.

The file is downloaded to your specified local directory, or you can open it to view in a separate browser window.

4.7 View RT Synchronized Reserve Award

A generation user can view the Real-Time Synchronized Reserve award details for the current day for each generating unit under their control.

The following generation information is presented for each generating unit included in the selected generation portfolio:

Location -- The name of the generating unit.

Area -- The zone/subzone area where the unit was awarded Synchronized Reserve MW's.

Offer MW -- The amount of offered Synchronized Reserve MW's for the unit.

Self-Scheduled MW -- The amount cleared for Synchronized Reserve as self-scheduled MW's.

Awarded MW -- The amount of cleared Synchronized Reserve MW's.

Steps (from the left navigation bar):

- Select **Generator**.
- Select **Market Results**.
- Select the **RT Synchronized Reserve Award** tab.
The RT Synchronized Reserve Award web page appears.
- Select the desired portfolio from the Portfolio List.
The list of generating units included in the selected portfolio appears in the Location List.
- Select the desired location from the Location List.
- Select the desired hour from the Hour List.
- Click the Market Day calendar to select the date.
- Click the **Refresh** button.
- Review the following information for each generating unit:
 - Location
 - Area
 - Offer MW
 - Self-Scheduled MW
 - Awarded MW

To download selected information, click the **XML** or **CSV** report buttons.

The file is downloaded to your specified local directory, or you can open it to view in a separate browser window.

4.8 View DA Non-Synchronized Reserve Award

A generation user can view the Day-Ahead Non-Synchronized Reserve award details for the approved market day for each generating unit under their control.

The following generation information is presented for each generating unit included in the selected generation portfolio:

Location -- The name of the generating unit.

Area -- The zone/subzone where the unit was awarded Non-Synchronized Reserve MW's.

Offer MW -- The amount of offered Non-Synchronized Reserve MW's for the unit.

Awarded MW -- The amount of cleared Non-Synchronized Reserve MW's.

Steps (from the left navigation bar):

- Select **Generator**.
- Select **Market Results**.
- Select the **DA Non-Synchronized Reserve Award** tab.
The DA Non-Synchronized Reserve Award web page appears.
- Select the desired portfolio from the Portfolio List.
The list of generating units included in the selected portfolio appears in the Location List.
- Select the desired location from the Location List.
- Select the desired hour from the Hour List.
- Click the Market Day calendar to select the date.
- Click the **Refresh** button.
- Review the following information for each generating unit:
 - Location
 - Area
 - Offer MW
 - Awarded MW

To download selected information, click the **XML** or **CSV** report buttons.

The file is downloaded to your specified local directory, or you can open it to view in a separate browser window.

4.9 View DA Secondary Reserve Award

A generation user can view the Day-Ahead Secondary Reserve award details for the approved market day for each generating unit under their control.

The following generation information is presented for each generating unit included in the selected generation portfolio:

Location -- The name of the generating unit.

Area -- The zone/subzone where the unit was awarded Day-Ahead Secondary Reserve MW's.

Offer MW -- The amount of offered Day-Ahead Secondary Reserve MW's for the unit.

Awarded MW -- The amount of cleared Day-Ahead Secondary Reserve MW's.

Steps (from the left navigation bar):

- Select **Generator**.
- Select **Market Results**.
- Select the **DA Secondary Reserve Award** tab.
The DA Secondary Reserve Award web page appears.

- Select the desired portfolio from the Portfolio List.
The list of generating units included in the selected portfolio appears in the Location List.
- Select the desired location from the Location List.
- Select the desired hour from the Hour List.
- Click the Market Day calendar to select the date.
- Click the **Refresh** button.
- Review the following information for each generating unit:
 - Location
 - Area
 - Offer MW
 - Awarded MW

To download selected information, click the **XML** or **CSV** report buttons.

The file is downloaded to your specified local directory, or you can open it to view in a separate browser window.

4.10 View RT Secondary Reserve Award

A generation user can view the Real-Time Synchronized Reserve award details for current day for each generating unit under their control.

The following generation information is presented for each generating unit included in the selected generation portfolio:

Location -- The name of the generating unit.

Area – The zone/subzone where the unit was awarded Real-Time Synchronized Reserve MW's.

Offer MW – The amount of offered Real-Time Secondary Reserve MW's for the unit.

Awarded MW – The amount of cleared Real-Time Secondary Reserve MW's.

Steps (from the left navigation bar):

- Select **Generator**.
- Select **Market Results**.
- Select the **RT Synchronized Reserve Award** tab.
The RT Synchronized Reserve Award web page appears.
- Select the desired portfolio from the Portfolio List.
The list of generating units included in the selected portfolio appears in the Location List.
- Select the desired location from the Location List.
- Select the desired hour from the Hour List.
- Click the Market Day calendar to select the date.

- Click the **Refresh** button.
- Review the following information for each generating unit:
 - Location
 - Area
 - Offer MW
 - Awarded MW

To download selected information, click the **XML** or **CSV** report buttons.

The file is downloaded to your specified local directory, or you can open it to view in a separate browser window.

5.0 Managing Unit Data

5.1 Unit Generator Data Overview

Generator data is defined on a unit-basis, as well as a schedule basis. Data defined on a unit basis includes unit ownership information, operating limits, ramp rates, CT weather curve data, availability status and Startup and No-Load prices for priced-based units. Regulation limits are also defined on a unit basis.

5.2 Which Web Pages Do I Use?

The following web page is used to view and manage unit-level information:

Hourly Updates – Use this web page to submit hourly Emergency/Eco Min/Max MW levels and commit status.

Detail – Use this web page to view unit ownership information and modify unit operating limits and ramp rates.

Ramp Rates – Use this web page to submit daily MW/min segments at defined unit outputs.

Ramp Rate Updates – Use this web page to submit hourly updates to your daily Ramp Rates submissions.

Wind Forecast – Use this web page to view forecast data for wind units (see section 29)

Solar Forecast – Use this web page to view forecast data for solar units (see section 30)

Intraday Opt Out – Use this web page to opt out of the hourly updates functionality on a monthly basis.

ESR Updates - Use this web page to provide solar unit “State of Charge MW” data.

Resource Limitations – Use this web page to enter unit-level or fuel-level limitation information to communicate restrictions that may limit run time and fuel availability parameters.

5.3 View Unit-specific Ownership Information

PJM requires that the Operating Company submit to PJM unit-specific information about a generating unit. This information is used to create the initial generating unit record in the Markets Database. This information is submitted in writing to PJM prior to the Operating Company submitting offers. (For more information on the data that is required, see **PJM Manual 11: Energy & Ancillary Services Market Operations and the Markets Database Dictionary**.)

Upon receipt of information, PJM creates the necessary records in the Markets Database. Some of this information is included on the Generator ->Unit->Detail web page but cannot be modified. The following unit-specific information is presented:

Type of Unit – The long name of the type of unit.

Plant Name – The full name of the plant. A plant is a group of generating units located at the same site.

Unit Number – The generating unit's identifier at a site or plant.

Unit Name – The abbreviated name of the generating unit.

Node – A valid PJM price node, or bus, for which PJM calculates Day-Ahead and Real-Time LMPs. PJM and the EDC assign the price node for each generating unit based on the unit's telemetry and on the PJM state estimator model.

Operating Company – The full name of the Market Participant that is responsible for operating the generating unit.

Capacity Resource – Indicates if the generating unit is a Capacity Resource.

Regulation Resource – Indicates if the generating unit is a regulation resource as certified by PJM.

Capacity Performance – Indicates if the generating unit has a capacity performance obligation.

Energy Storage – Indicates if the generating unit has energy storage capability, i.e. a battery.

Fast Start – Indicates if the generating unit has fast start capability.

Steps (from the left navigation bar):

Select **Generator**.

Select **Unit**.

Select the **Detail** tab.

The Unit Detail web page appears.

Click the Market Day calendar to select the date.

Select the desired portfolio from the Portfolios list.

The list of generating units for the selected portfolio appears in the Units List.

Select the desired location from the Location list.

The unit data for the selected unit appears on the Unit Detail page.

Review the following unit-specific ownership information:

- Type of Unit
- Unit Number
- Operating Company
- Plant Name
- Unit Name
- Node
- Capacity Resource
- Regulation Resource
- Capacity Performance
- Energy Storage
- Fast-Start

To download selected information, click the **XML** or **CSV** report buttons.

The file is downloaded to your specified local directory, or you can open it to view in a separate browser window.

5.4 View & Modify Unit MW Limits

The Unit Detail screen serves as the default values for the generating unit. The MW operating limits must be specified at the unit level, but can be overridden at a schedule level, and on an hourly basis. MW limits for CTs using temperature-based adjustments can also be made, using weather data. The hierarchy of MW operating limits is:

- A generating unit's default unit MW limits are superseded by the unit's schedule MW operating limits.
- A unit's schedule MW operating limits are superseded by its weather-sensitive adjustments.
- Unit hourly overrides to the operating limits supersede all other operating limits.

Only CT's may submit weather curves, which specify MW limits as a function of temperature. There are separate weather curves for economic MW and for emergency MW. Each CT is assigned to a weather point. The weather forecast page contains the assigned weather points for CT's that are using temperature-based adjustments. Forecast points shall consist of a daytime temperature and a night-time temperature. These daytime and night-time temperature values interpolate with the submitted MW and temperature values from the CT's weather curve to reflect expected weather forecasts by zone.

The following limits are required at a generating unit level, and can be modified using the Unit Detail web page:

Defaults

Commit Status – See section 5.6 – 5.8 below.

Fixed Generation – See section 5.8 below.

Ramp Rate (MW/Min.) – The default energy ramp rate, in MW/minute, for increasing or decreasing a unit's output. This default rate is used by PJM in the Day-Ahead commitment process. The default value is 1.0 MW/minute.

Miscellaneous

Synch Max (MW) – The maximum value, in MW, of output a resource can achieve in response to a synchronized reserve event. This quantity is defined as the increase in output achievable by the unit in ten (10) minutes. This is the default Synchronized Maximum Limit. It must be higher than or equal to the economic maximum of the unit. The default value is 0.0 MW.

Reduced Ramp Rate Percent – Minimum percentage of the bid-in ramp rate used for the reduced energy ramp rate logic when a unit is providing both energy and regulation. Values must be whole numbers, and negative values are not allowed. If you enter zero (the default value) then 100% of the assigned Energy MW (divided by 5) will reduce the bid-in energy ramp rate for SCED.

Secondary Max – The maximum value, in MW, of output a resource can achieve in response to a secondary reserve event. This quantity is defined as the increase in output achievable by the unit in thirty (30) minutes. This is the default Secondary Maximum Limit.

Self Supply – Indicates whether the unit will self supply any shortcomings in their must offer requirements.

Use Extended Cold – Indicates whether PJM should use the Extended Cold Notification in the scheduling process. This data item is not applicable for cost-based schedules.

Dual Fuel Capability – Indicates if the unit is capable of running off of 2 different fuel sources.

Approved Fuel Cost Policy – Indicates whether the unit has been approved for its stated costs based on the fuel used.

Allow Pumping Unit Provide Reserve – Indicator for Hydro Pumping units to indicate whether the unit can be used to provide reserves.

Discharge Synch Max, State of Charge Min, Discharge Secondary Max, Flexible Reserve, Charge Synch Max,

State Of Charge Max and Charge Secondary Max – See “Managing Energy Storage Resources” below.

Economic & Emergency

NOTE: The following fields will have either a Charge or Discharge pre-fix if the unit is an Energy Storage Resource.

Emergency Min (MW) – The lowest level of energy, in MW, the unit can produce and maintain a stable level of operation. The Operating Company operates the unit at this level during a PJM declared Minimum Generation Emergency. This is the default Emergency Minimum Limit. It is in effect if no schedule or hourly value is specified and no temperature-based adjustment is specified in the weather data. The default value is 0.0 MW. For a wind resource, this value must be less than or equal to the resource's CIR value. Submitting a value greater than the CIR value will trigger a warning message indicating that the Economic Min value will be capped at the Emergency Min value in the Real Time market clearing engine.

Economic Min (MW) – The minimum energy available, in MW, from the unit for economic dispatch. This is the default Economic Minimum Limit. It is in effect if no schedule or hourly value is specified and no temperature-based adjustment is specified in the weather data. CTs are permitted to provide an Economic Minimum Limit less than the physical economic minimum value of the unit. The default value is 0.0 MW. For a wind resource, the Economic Min must be less than or equal to the resource's CIR value. Submitting a value greater than the CIR value will trigger a warning message indicating that the Economic Min value will be capped at the CIR value in the Real Time market clearing engine.

Economic Max (MW) – The maximum energy available, in MW, from the unit for economic dispatch. This is the default Economic Maximum Limit. It is in effect if no schedule or hourly value is specified and no temperature-based adjustment is specified in the weather data. The default value is 0.0 MW.

Emergency Max (MW) – The highest short-term MW level a generating unit can produce and may require extraordinary procedures to produce the desired output. The Operating Company operates the unit at this level during a PJM declared Maximum Emergency Generation. This is the default Emergency Maximum Limit. It is in effect if no schedule or hourly value is specified and no temperature-based adjustment is specified in the weather data. The default value is 0.0 MW.

Weather Point

Low Economic Temperature – The low temperature point (in °F) for a resource's weather curve. This value coincides with the unit's Low Economic MW value on the weather curve.

Low Economic MW – The energy production, in MW, for the low temperature point on a resource's weather curve. This value will override a unit's schedule MW operating limits.

Middle Economic Temperature – The middle temperature point (in °F) for a resource's weather curve. This value coincides with the unit's Middle Economic MW value on the weather curve.

Middle Economic MW – The energy production, in MW, for the middle temperature point on a resource's weather curve. This value will override a unit's schedule MW operating limits.

High Economic Temperature – The high temperature point (in °F) for a resource's weather curve. This value coincides with the unit's High Economic MW value on the weather curve.

High Economic MW – The energy production, in MW, for the high temperature point on a resource's weather curve. This value will override a unit's schedule MW operating limits.

Low Emergency Temperature – The low temperature point (in °F) for a resource's weather curve, corresponding to the unit's emergency limits. This value coincides with the unit's Low Emergency MW value on the weather curve.

Low Emergency MW – The energy production, in MW, for the low temperature point on a resource's weather curve, corresponding to the unit's emergency limits. This value will override a unit's schedule MW emergency limits.

Middle Emergency Temperature – The middle temperature point (in °F) for a resource's weather curve, corresponding to the unit's emergency limits. This value coincides with the unit's Middle Emergency MW value on the weather curve.

Middle Emergency MW – The energy production, in MW, for the middle temperature point on a resource's weather curve, corresponding to the unit's emergency limits. This value will override a unit's schedule MW emergency limits.

High Emergency Temperature – The high temperature point (in °F) for a resource's weather curve, corresponding to the unit's emergency limits. This value coincides with the unit's High Emergency MW value on the weather curve.

High Emergency MW – The energy production, in MW, for the high temperature point on a resource's weather curve, corresponding to the unit's emergency limits. This value will override a unit's schedule MW emergency limits.

Steps (from the left navigation bar):

Select **Generator**.

Select **Unit**.

Select the **Detail** tab.

The Unit Detail web page appears.

Click the Market Day calendar to select the date.

Select the desired portfolio from the Portfolios list.

The list of generating units for the selected portfolio appears in the Location List.

Select the desired location from the Location list.

The unit data for the selected unit appears on the Unit Detail page.

Review the following unit-specific information:

- Commit Status
- Fixed Generation
- Ramp Rate (MW/Min.)
 - Reduced Ramp Rate Percent
 - Secondary Max
 - Allow Pumping Unit to Provide Reserve (Hydro only)
 - Self Supply
 - Used Extended Cold
 - Dual Fuel Capability
 - Approved Fuel Cost Policy
 - Discharge Synch Max (ESR & Hybrid only)
 - State Of Charge Min (ESR & Hybrid only)
 - Discharge Secondary Max (ESR & Hybrid only)
 - Flexible Reserve (ESR & Hybrid only)

- Charge Synch Max (ESR & Hybrid only)
- State Of Charge Max (ESR & Hybrid only)
- Charge Secondary Max (ESR & Hybrid only)
- Emergency Min (MW)
- Emergency Max (MW)
- Economic Min (MW)
- Economic Max (MW)
- Synch Max (MW)
- Low Economic Temperature
- Low Economic MW
- Middle Economic Temperature
- Middle Economic MW
- High Economic Temperature
- High Economic MW
- Low Emergency Temperature
- Low Emergency MW
- Middle Emergency Temperature
- Middle Emergency MW
- High Emergency Temperature
- High Emergency MW
- Use Cost Based Startup 1
- Use Cost Based Startup 2
- No Load Cost 1
- No Load Cost 2
- Cold Startup Cost 1
- Cold Startup Cost 2
- Intermediate Startup Cost 1
- Intermediate Startup Cost 2
- Hot Startup Cost 1
- Hot Startup Cost 2
- Available
- Energy Usage
- Notification Time
- To Generate Time

- Reserve as Condenser
- Startup Cost
- To Generation Cost
- Hourly Cost

Select the value you wish to update.

An entry box will appear.

Update the limits by entering the new value.

Click the **Save** button.

“Success: Save successful” message is displayed.

To download selected information, click the **XML** or **CSV** report buttons.

The file is downloaded to your specified local directory, or you can open it to view in a separate browser window.

Select **Weather Forecast**.

The Weather Forecast web page appears.

Click the Market Day calendar to select the date.

The list of assigned weather points for the selected date appears in the Location List.

Enter data for the desired Station by clicking on one of the following fields:

- Daytime Temperature
- Nighttime Temperature

Click the **Save** button.

“Success: Save successful” message is displayed.

To download selected information, click the **XML** or **CSV** report buttons.

The file is downloaded to your specified local directory, or you can open it to view in a separate browser window.

5.5 Define Ramp Rate by MW Segments

A generating unit's ramp rate can be defined by MW ranges, or segments. The MW segment ramp rates are used in both the Day-Ahead commitment process and during Real-Time operations. In the Day-Ahead market, segmented ramp rates are not required, but if segmented ramp rates are provided, they will override the default ramp rate (entered on the Unit Detail web page).

A maximum of twenty MW ramp rate segments can be defined (the same applies per hour for hourly differentiated ramp rates).

- The first MW/ramp rate segment represents the ramp rate from 0 MW/0 Min to the first MW/Min point.
- The second MW/ramp rate point represents the ramp rate from the first MW point to the second MW point (and so on).

The following information is entered on the Unit Energy Ramp Rates web page to define energy ramp rate segments:

- **MW** – The MW output of the unit associated with this ramp rate segment.
- **Up Ramp Rate** – The increase in MW per minute at the output defined for a given segment.
- **Down Ramp Rate** – The decrease in MW per minute at the output defined for a given segment. The down ramp rate **must be greater than or equal to** the up-ramp rate. If no down ramp rate is submitted, the up-ramp rate value per segment will be assumed as the down ramp rate.

Steps (from the left navigation bar):

Select **Generator**.

Select **Unit**.

Select the **Ramp Rates** tab.

The Ramp Rates web page appears.

Click the Market Day calendar to select the date.

Select the desired portfolio from the Portfolios list.

The list of generating units for the selected portfolio appears in the Units List.

Select the desired location from the Location list.

Right click to display short-cut menu.

Left click on **Add Segment**.

A new row appears on the web page.

Enter data into the following fields:

- MW
- Up Ramp Rate
- Down Ramp Rate (optional)

Click the **Save** button.

“Success: Save successful” message is displayed.

To download selected information, click the **XML** or **CSV** report buttons.

The file is downloaded to your specified local directory, or you can open it to view in a separate browser window.

Hourly differentiated segmented ramp rates can be submitted on a unit level to provide more flexibility for resource operating parameters or conditions. These hourly differentiated segmented ramp rates also follow the same lockout periods as defined for hourly incremental energy offers. The segmented ramp rate cannot be updated during the Day-Ahead clearing window (11:00 – 13:30) for the next operating day. After the Day-Ahead market close (11:00), the MW breakpoints on the hourly differentiated segmented ramp rate curve cannot be updated. Only the ramp rate may be updated. During the Rebid period (13:30 – 14:15), the segmented ramp rate can be updated regardless of the Day-Ahead commitment status. In Real-Time, after the RAC run (18:30), the segmented ramp rate can be updated up to 65 minutes prior to the operating hour.

Market participants can update the hourly segmented ramp rates regardless of the commitment status in Day-Ahead or Real-Time as long as it's outside of the lockout periods defined above. The down ramp rate cannot be less than the up-ramp rate.

The following information is entered on the **Ramp Rate Updates** web page to define hourly differentiated energy ramp rate segments:

- **Hour** – The hour selected for the desired ramp rate(s).
- **MW** – The MW output of the unit associated with this ramp rate segment.
- **Up Rate** – The increase in MW per minute at the output defined for a given segment.
- **Down Rate** – The decrease in MW per minute at the output defined for a given segment. The down ramp rate **must be greater than or equal to** the up-ramp rate. If no down ramp rate is submitted, the up-ramp rate value per segment will be assumed as the down ramp rate.

Steps (from the left navigation bar):

Select **Generator**.

Select Unit.

Select the **Ramp Rate Updates** tab.

The Ramp Rate Updates web page appears.

Click the Market Day calendar to select the date.

Select the desired portfolio from the Portfolios list.

The list of generating units for the selected portfolio appears in the Units List.

Select the desired location from the Location list.

Right click to display short-cut menu.

Left click on **Add Segment**.

A new row appears on the web page.

Enter data into the following fields:

- MW
- Up [Ramp] Rate
- Down [Ramp] Rate (optional)

Click the **Save** button.

"Success: Save successful" message is displayed.

To download selected information, click the **XML** or **CSV** report buttons.

The file is downloaded to your specified local directory, or you can open it to view in a separate browser window.

5.6 Modify Unit Status

The status of the generating unit is determined on a unit basis, using the Unit Detail web page. The status on the Unit Detail is used to reflect the unit's long-term status. This is the default for the unit. The Unit Hourly Updates web page is used to reflect real-time changes to the unit status and overwrites the unit status on the Unit Detail web page.

If the status changes during real-time (for example, the unit becomes unavailable or limits change as a result of operating problems), the Operating Company uses the Unit Hourly Updates web page to provide the updated status.

The following unit statuses are available from the Unit Detail web page using the Commit Status drop-down located in the Defaults section of the Unit Detail screen:

Economic – Indicates that a unit is available for normal economic dispatch. This is the default.

Emergency – Indicates that a unit is available only for emergency dispatch.

Must Run – Indicates that the generating unit is self-scheduling. Unit MUST be committed. The unit is committed at Economic Min and allowed to move up to Economic Max.

Not Available – Indicates that the unit is unavailable.

(NOTE: Only one status can be selected at a time for a unit.)

Steps (from the left navigation bar):

Select **Generator**.

Select **Unit**.

Select the **Detail** tab.

The Unit Detail web page appears.

Click the Market Day calendar to select the date.

Select the desired portfolio from the Portfolios list.

The list of generating units for the selected portfolio appears in the Location list.

Select the desired unit from the Location list.

The unit data for the selected location appears on the Unit Detail web page.

Locate the Commit Status field in the Defaults section.

Dropdown box is available with choices.

Select one of the following fields:

- Economic
- Emergency
- Must Run
- Not Available

Click the **Save** button.

"Success: Save successful" message is displayed.

To download selected information, click the **XML** or **CSV** report buttons.

The file is downloaded to your specified local directory, or you can open it to view in a separate browser window.

5.7 Self-schedule a Generating Unit and Follow PJM Dispatch Instruction

If a user wants to self-schedule (or must run) a generating unit, the user must submit a must run status. The user must also determine if whether the unit can follow PJM dispatch instructions or it is block loaded. If a user would like to indicate its willingness to follow PJM dispatch, the following information on the Unit Detail web page is used to self-schedule a generating unit for the entire Operating Day:

Must Run Status – Indicates that the generating unit is self-scheduling. Therefore, the unit **MUST** be committed. The unit is committed at Economic Min and allowed to move up to Economic Max.

Economic Min – The minimum energy available, in MW, from the unit for economic dispatch. This is the default Economic Minimum Limit. It is in effect if no schedule or hourly value is specified and no temperature-based adjustment is specified in the weather data. CTs are permitted to provide an Economic Minimum Limit less than the physical economic minimum value of the unit. The default value is 0.0 MW.

Economic Max – The maximum energy available, in MW, from the unit for economic dispatch. This is the default Economic Maximum Limit. It is in effect if no schedule or hourly value is specified and no temperature-based adjustment is specified in the weather data. The default value is 0.0 MW.

To self-commit a unit and allow PJM to issue dispatch instructions, the Operating Company submits a must run status for the unit, with an economic minimum limit less than the economic maximum limit.

Steps (from the left navigation bar):

Select **Generator**.

Select **Unit**.

Select the **Detail** tab.

The Unit Detail web page appears.

Click the Market Day calendar to select the date.

Select the desired portfolio from the Portfolio list.

The generating units for the selected portfolio appear in the Location list.

Select the generating unit that you want to self-schedule from the Location list.

The data for the selected generating unit appears on the Unit Detail web page.

Locate the Commit Status dropdown box in the Defaults section.

Select a 'Must Run' Default Commit Status.

Enter the following data the ability to follow PJM dispatch instructions:

- Economic Min
- Economic Max

Click the **Save** button.

"Success: Save successful" message is displayed.

To download selected information, click the **XML** or **CSV** report buttons.

The file is downloaded to your specified local directory, or you can open it to view in a separate browser window.

5.8 Self-schedule a Generating Unit and Ignore PJM Dispatch Instruction

If a user wants to self-schedule (must run) a generating unit, the user must submit a must run status. The user must also determine whether the unit can follow PJM dispatch instructions or if it is block loaded. If a user is not willing to follow PJM dispatch instruction, the following information on the Unit Detail web page is used to self-schedule a generating unit for the entire Operating Day:

Must Run Status – Indicates that the generating unit is self-scheduling. Therefore, the unit **MUST** be committed. The unit is committed at Economic Min and allowed to move up to Economic Max.

Economic Min – The minimum energy available, in MW, from the unit for economic dispatch. This is the default Economic Minimum Limit. It is in effect if no schedule or hourly value is specified and no temperature-based adjustment is specified in the weather data. CTs are permitted to provide an Economic Minimum Limit less than the physical economic minimum value of the unit. The default value is 0.0 MW.

Economic Max – The maximum energy available, in MW, from the unit for economic dispatch. This is the default Economic Maximum Limit. It is in effect if no schedule or hourly value is specified and no temperature-based adjustment is specified in the weather data. The default value is 0.0 MW.

Fixed Gen – This field should be set to yes if a generation resource intends to remain “fixed” or otherwise not follow PJM real-time dispatch. The default value is “No”

To submit a fixed MW schedule for the unit with a must run status, the Operating Company sets the Fixed Gen field to “Yes”. This field should be set to “Yes” if a generation resource intends to remain on a fixed schedule or otherwise not follow PJM real-time dispatch. This flag will be fed into the PJM Unit Dispatch System and will tell the system that the unit will not be responding to PJM dispatch signals. This information is needed to maintain an accurate overall dispatch solution as possible, and PJM encourages all generation not intending to follow dispatch to check this field. The field is not used by the Day-Ahead market.

Alternative Method: A user may also submit a fixed MW schedule for the unit with a must run status, by setting the Economic Minimum limit equal to the Economic Maximum limit.

Steps (from the left navigation bar):

Select **Generator**.

Select **Unit**.

Select the **Detail** tab.

The Unit Detail web page appears.

Click the Market Day calendar to select the date.

Select the desired portfolio from the Portfolio list.

The generating units for the selected portfolio appear in the Location list.

Select the generating unit that you want to self-schedule from the Location list.

The data for the selected generating unit appears on the Unit Detail web page.

Select a ‘Must Run’ Default Commit Status.

Click in the **Fixed Generation** box if a generation resource intends to remain “fixed” or otherwise not follow PJM real-time dispatch.

Enter the following data the ability to follow PJM dispatch instructions:

- Economic Min
- Economic Max

Click the **Save** button.

“Success: Save successful” message is displayed.

To download selected information, click the **XML** or **CSV** report buttons.

The file is downloaded to your specified local directory, or you can open it to view in a separate browser window.

5.9 Setting Unit to be Dual Fuel Capable

Generators that have the capability of running on multiple fuel types must first indicate that the unit is capable of running on multiple fuel types before offering different schedules for each fuel type. Details on submitting different offers based on fuel type can be found in section 9.0 of this guide.

Steps (from the left navigation bar):

Select **Generator**.

Select **Unit**.

Select the **Detail** tab.

The Unit Detail web page appears.

Click the Market Day calendar to select the date.

Select the desired portfolio from the Portfolio list.

The generating units for the selected portfolio appear in the Location list.

Select the generating unit that you want to indicate is dual fuel capable.

The data for the selected generating unit appears on the Unit Detail web page.

Check off the ‘Dual Fuel Capability’ box under the **Miscellaneous** section.

Click the **Save** button.

“Success: Save successful” message is displayed.

To download selected information, click the **XML** or **CSV** report buttons.

The file is downloaded to your specified local directory, or you can open it to view in a separate browser window.

5.10 Opt Out of Intraday Hourly Offers

Generators can opt in to the hourly updates functionality on a monthly basis if their Fuel Cost Policy supports it. Units will default to be Opted out of intraday offers. Opt in/Opt out is on the unit level (not schedule level or resource owner level) and will continue until the user cancels.

If a generator opts out, they may:

- Still provide hourly differentiation for their Day-Ahead 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 the incremental energy offer, min run time, and No Load and startup costs *after* the Rebid period.

Users must communicate their intention to opt in (or opt out) in the month prior to the month they want to begin opting in. The option may only be selected or deselected prior to midnight of the 16th day of the current month (up to the end of the 15th day). There is no XML capability for opt out.

Steps (from the left navigation bar):

Select **Generator**.

Select **Unit**.

Select the **Intraday Opt Out** tab.

The Intraday Opt Out web page appears.

Click the Market Day calendar to select the date.

Select the desired portfolio from the Portfolio list.

The generating units for the selected portfolio appear in the Location list.

Select the generating unit that you want to opt out from the Location list.

The data for the selected generating unit appears on the Intraday Opt Out web page.

Select the box for the last month under the **Month** column.

Opt out visibility will be on a rolling 5-month basis (3 months of history, the current month and the following month).

Select **Yes** or **No** under the **Opted-Out** column for the selected following month.

The PJM Override and Notes columns will indicate approved status and any notes associated with the unit's Fuel Cost Policy if denied.

Click the **Save** button.

“Success: Save successful” message is displayed.

5.11 Unit Limitations

Resources have the ability to enter unit-level or fuel-level limitation information, as a means to provide more dynamic notice to dispatch if a unit is running close to its limitations. This will include a calculation of estimated hours remaining using participant-entered hours remaining due to a limitation and unit runtime. If a unit has less than 72 hours of run time at maximum capacity due to any resource limitation (primary or alternate fuel, emissions, demineralized or cooling water, other consumables), this resource, along with any fuel limited units, should be reported to PJM through the “Unit Limitations” page of Markets Gateway. Any unit with less than 24 hours of run time remaining due to resource limitations should also update the Max Run fields in Markets Gateway.

Note: The information on the Unit Limitations page is used for situational awareness and multi-day operations planning. The parameters entered on this page are not utilized in the Day-Ahead or Real-Time Market clearing engines. It is understood that the resulting calculations are estimates and are used purely for operational awareness and improved communication between Dispatch and generation owners about these types of limitations.

The following information can be entered on the Unit Limitations web page:

Fuel Type – Select fuel type related to limitation.

Limitation Type – Limitations on a unit and fuel level. Unit-level limitations are Cooling Water, Demineralized Water, or Other Consumables. Fuel-Level limitations are Onsite Fuel or Emissions.

Start Time – Select date and time for limitation start.

End Time – Select date and time for limitation end.

Hours Remaining at Full Load – Enter hours remaining at full load between limitation start and end times.

Replenished Hours at Limitation End – Enter additional hours at full load after end time (e.g. from fuel delivery or roll-over of emissions hours).

Is Unlimited at Reduced Output – Select Yes or No.

PJM Estimated Hours Remaining – This is a calculation using actual on hours to count down participant-entered “Hrs. Remaining at Full Load” to create a dynamic estimate of runtime remaining due to a limitation.

Steps (from the left navigation bar):

Select **Generator**.

Select **Unit Limitations**.

The Unit Limitations web page appears.

Click the Start Day and End Day calendars to select the dates.

Select the desired portfolio from the Portfolio list.

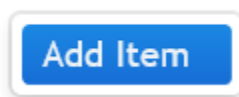
The generating units for the selected portfolio appear in the Location list.

Select the generator unit for which you want to submit limitations from the Location list.

The unit limitation fields for data entry for the selected generating unit appears below on the Unit Limitations web page.

Point your cursor to the white portion of the screen below the last previously entered unit limitation row, or below the column headings filters row (the row that contains the greyed-out Location, Fuel Type, and Limitation Type drop-downs).

Right click using your mouse while the cursor is pointing to the white portion on the screen to display the Add Item pop-up option:



Press Enter or Click on the Add Item to add a new Unit Limitation line on the screen.

Select the Limitation ID dropdown to enter a *greater than*, *less than*, or *equal to* value.

Select the Location dropdown to select the resource to which the limitations apply.

Select the Fuel Type dropdown to choose the appropriate fuel type related to the limitations.

Select the Limitation Type dropdown to choose the appropriate unit-level or fuel-level limitations.

Select the Start Time dropdown to choose the limitation start date and time.

Select the End Time dropdown to choose the limitation end date and time.

Select the Hrs. Remaining at Full Load dropdown to enter the hours remaining at full load between the limitation start and end times.

Select the Replenished Hrs. at Limit. End dropdown to enter additional hours at full load after the end time.

Select the Is Unlimited at Reduced Output dropdown to choose yes or no.

Click the **Save** button.

“Success: Save successful” message is displayed.

5.12 Gas Procurement

Following NERC requirement TOP-005-2 effective October 1, 2025, units with the natural gas fuel type (either exclusively gas or as one of several fuel types) will be asked whether they anticipate difficulties in their ability to procure sufficient fuel to meet their Day-ahead commitments or real time reliability requirements during extreme weather events. As a separate section on the Unit Limitations tab, the data displayed here is the latest declared status from unit owners and is expected to be updated as this status changes. Dispatch will reach out to unit owners during system events via All Call to remind unit owners to update this data.

Note: The information on the Unit Limitations page is used for situational awareness and multi-day operations planning. The parameters entered on this page are not utilized in the Day-Ahead or Real-Time Market clearing engines.

The following information can be entered on the Unit Limitations web page:

Procurement Status – Select between the following options:

Yes, difficulties are expected.

No, no issues expected.

Uncertain, varying degree of confidence on whether sufficient fuel is available at this time.

Comments – Enter any additional contextual information, e.g. how long fuel issues are expected to last.

Last Updated Time – This field cannot be entered but displays the last time the Procurement Status or Comments have been updated.

Steps (from the left navigation bar):

Select **Generator**.

Select **Unit Limitations**.

The Unit Limitations web page appears.

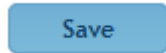
Select the Gas Procurement tab on the Unit Limitations web page.

By default, all locations under the portfolio are displayed; select a procurement status for each unit.

Each modified row turns yellow to indicate an unsaved change.

Enter a comment for each unit to provide as much detail as possible, e.g. number of days of concern.

Click the **Save** button in the upper right-hand corner.



Each modified row returns to the default color with the saved data.

5.13 Zero Marginal Cost Fuel Cost Policy

Zero marginal cost resources (e.g. wind and solar) are no longer required to have a PJM-approved fuel cost policy. Resources that do not have a PJM-approved fuel cost policy or resources that indicate to PJM that they wish to use the temporary cost offer methodology are required to submit \$0/MWh in Markets Gateway. These resources may only submit \$0 for their cost-based start-up cost, no load cost, and incremental energy offer curve. PJM will send a flag to the Markets Gateway Unit Detail web page for resources that do not have an approved fuel cost policy and are not using the temporary offer methodology.

All currently approved zero marginal cost fuel cost policies expired on November 1, 2020. Market Sellers must email FuelCostPolicyAnalysis@pjm.com and indicate to PJM that they wish to use the temporary cost offer methodology, and must receive confirmation from PJM that the temporary cost offer methodology can be used. No action is required if the resource wants to enter \$0 for all cost-based schedules. Resources without an approved fuel cost policy, which are not using the temporary cost offer methodology, will only be able to enter \$0 for all cost-based schedules.

Under the Generator Unit Detail web page, when the Fuel Cost Policy flag is set to 1, the following Markets Gateway offer submission screens will only allow members to enter “0” for all hours on all cost-based schedules (schedules 1-9):

Steps (from the left navigation bar):

Select **Generator**.

Select **Schedules**.

Select **Offers**.

The Schedules Offers web page appears.

Click the Market Day calendar to select the date.

Select the desired portfolio from the Portfolio list.

The generating units for the selected portfolio appear in the Location list.

Select the generating unit from the Location list.

Under the Price column, enter “0”.

Click the **Save** button.

“Success: Save successful” message is displayed.

Select **Generator**.

Select **Schedules**.

Select Offer Updates.

The Schedules Offer Updates web page appears.

Click the Market Day calendar to select the date.

Select the desired portfolio from the Portfolio list.

The generating units for the selected portfolio appear in the Location list.

Select the generating unit from the Location list.

Under the Price column, enter “0”.

Click the **Save** button.

“Success: Save successful” message is displayed.

Select Generator.**Select Schedules.****Select Detail.**

The Schedules Detail web page appears.

Click the Market Day calendar to select the date.

Select the desired portfolio from the Portfolio list.

The generating units for the selected portfolio appear in the Location list.

Select the generating unit from the Location list.

Select the schedule from the Schedule list.

Under the Cost section, enter “0” in the Cold/Intermediate/Hot Startup and No-Load fields.

Click the **Save** button.

“Success: Save successful” message is displayed.

Select Generator.**Select Schedules.****Select Detail Updates.**

The Schedules Detail Updates web page appears.

Click the Market Day calendar to select the date.

Select the desired portfolio from the Portfolio list.

The generating units for the selected portfolio appear in the Location list.

Select the generating unit from the Location list.

Select the schedule from the Schedule list.

Enter “0” under the No Load Cost, Cold Startup Cost, Intermediate Startup Cost and Hot Start Up cost fields.

Click the **Save** button.

“Success: Save successful” message is displayed.

Under the Generator Unit Detail web page, when the Fuel Cost Policy flag is set to 1, the following Markets Gateway offer submission screens will only allow members to enter “0” for all hours on the startup and no load portion of a price-based schedule (schedules 79 & 99) when a price-based unit elects to use a cost-based startup and no load:

Steps (from the left navigation bar):

Select **Generator**.

Select **Schedules**.

Select **Detail**.

The Schedules Detail web page appears.

Click the Market Day calendar to select the date.

Select the desired portfolio from the Portfolio list.

The generating units for the selected portfolio appear in the Location list.

Select the generating unit from the Location list.

Select the schedule from the Schedule list.

Under the Cost section, enter “0” in the Cold/Intermediate/Hot Startup and No-Load fields.

Click the **Save** button.

“Success: Save successful” message is displayed.

Select **Generator**.

Select **Schedules**.

Select **Detail Updates**.

The Schedules Detail Updates web page appears.

Click the Market Day calendar to select the date.

Select the desired portfolio from the Portfolio list.

The generating units for the selected portfolio appear in the Location list.

Select the generating unit from the Location list.

Select the schedule from the Schedule list.

Enter “0” under the No Load Cost, Cold Startup Cost, Intermediate Startup Cost and Hot Start Up cost fields.

Click the **Save** button.

“Success: Save successful” message is displayed.

6.0 Managing Unit Startup & No-Load Data

6.1 Generator Startup & No-Load Data Overview

Several different price and cost components are needed to determine a generating unit's total production cost. The total production cost includes Startup cost (or price), No Load cost (or price) and incremental costs (or prices).

- Startup cost (or price) is associated with the cost to supply steam to operate the turbine and bring the generating unit to synchronous speed. There are three categories of Startup costs (or prices):
 - Hot Startup Cost – Dollars per start when the generating unit is in a hot temperature state.
 - Intermediate Startup Cost – Dollars per start when the generating unit is in an intermediate temperature state.
 - Cold Startup Cost – Dollars per start when the generating unit is in a cold temperature state.
- No Load cost (or price) is the hourly fixed cost (or price), expressed in \$/hr, to run the generating unit at zero net output. It can include hourly No Load costs and other fixed costs.

6.2 Which Web Pages Do I Use?

The following web pages are used to view and modify Startup and No-Load data:

- **Unit Detail** – Use this web page to view and modify Startup and No-Load prices for price-based units.
- **Schedule Detail** – Use this web page to view and modify Startup and No-Load costs for cost-based schedules and to set the Start-up/No Load switch for price-based units.
- **Schedule Detail Updates** – Use this web page to view and modify Startup and No-Load costs on an hourly basis for cost-based schedules and price-based schedules with cost-based Startup and No-Load costs.
- **Schedule Selection** – Use this web page to view and modify Startup and No-Load costs on multiple schedules simultaneously.

6.3 Change Startup & No Load Offers for Price-based Units

A price-based unit has the option to choose price-based or cost-based Startup and No-Load fees.

The choice between using cost-based and price-based Startup and No Load fees can be made twice a year during the same open enrollment window (on or before 1100 hours March 31 for the period April 1 through September 30 and on or before 1100 hours September 30 for the period October 1 through March 31). Period 1 is defined as the period of time beginning April 1 and ending September 30. Period 2 is defined as the period of time beginning October 1 and ending March 31. If a price-based unit chooses the cost-based Startup and No-Load fees option, the decision cannot be changed until the next open enrollment period takes place.

- **Period 1** – The open enrollment for Period 1 is on or before 1100 hours March 31, for period April 1 through September 30.
- **Period 2** – The open enrollment for Period 2 is on or before 1100 hours September 30, for period October 1 through March 31.

Use the Unit Detail web page to change the Startup and No-Load costs during the open enrollment periods. Note that data for only one period is available to be changed at a time. This is indicated by the text boxes next to the enterable fields (text boxes).

The following information is presented on the Unit Detail web page:

- **Use Cost-Based Startup 1** – Indicates whether or not a unit's Startup costs and No-Load costs are cost-based for Period 1. A checkmark in the box indicates that the Startup and No Load are cost-based.
- **No Load Cost 1** – The No Load offer, specified in dollars, to be used during the first bi-annual period. The default value is \$0.00.
- **Cold Startup Cost 1** – The cold temperature Startup offer, specified in dollars, to be used during the first bi-annual period. The default value is \$0.00.
- **Intermediate Startup Cost 1** – The intermediate temperature state Startup offer, specified in dollars, to be used during the first bi-annual period. The default value is \$0.00.
- **Hot Startup Cost 1** – The hot temperature Startup offer, specified in dollars, unit to be used during the first bi-annual period. The default value is \$0.00.
- **Use Cost-Based Startup 2** – Indicates whether or not a unit Startup costs and No-Load costs are cost-based for Period 2. A checkmark in the box indicates that the Startup and No Load are cost-based.
- **No Load Cost 2** – The No Load offer, specified in dollars, to be used during the second bi-annual period. The default value is \$0.00.
- **Cold Startup Cost 2** – The cold temperature state Startup offer, specified in dollars, to be used during the second bi-annual period. The default value is \$0.00.
- **Intermediate Startup Cost 2** – The intermediate temperature state Startup offer, specified in dollars, to be used during the second bi-annual period. The default value is \$0.00.
- **Hot Startup Cost 2** – The hot temperature Startup offer, specified in dollars, to be used during the second bi-annual period. The default value is \$0.00.

Steps (from the left navigation bar):

Select **Generator**.

Select **Unit**.

Select the **Detail** tab.

The Unit Detail web page appears.

Click the Market Day calendar to select the date.

Select the desired portfolio from the Portfolio list.

The generating units for the selected portfolio appear in the Location list.

Select the generating unit from the Location list.

The data for the selected generating unit appears on the Unit Detail web page.

During the open enrolment for Period 1, enter the following data:

- Check or Uncheck Use Cost-Based Startup 1
- No Load Cost 1
- Cold Startup Cost 1
- Intermediate Startup Cost 1
- Hot Startup Cost 1

During the open enrollment for Period 2, enter the following data:

- Check or Uncheck Use Cost Based Startup 2
- No Load Cost 2
- Cold Startup Cost 2
- Intermediate Startup Cost 2
- Hot Startup Cost 2

Click the Save button.

“Success: Save successful” message is displayed.

To download selected information, click the **XML** or **CSV** report buttons.

The file is downloaded to your specified local directory, or you can open it to view in a separate browser window.

6.4 Hourly Startup & No Load Offers for Price-based Units

A price-based unit that has chosen to use cost-based Startup and No-Load fees has the ability to submit hourly differentiated Startup and No-Load costs as well as the ability to update them on an hourly basis. The hourly differentiated costs and hourly updates overwrite any values written on the unit detail page. For units that have been committed in the Day-Ahead market or the Real Time market, hourly updates cannot be made to the Startup and No-Load costs during committed hours. For hours that are not committed, hourly updates are permitted. Price-based units that have chosen not to use cost-based Startup and No-Load fees, hourly differentiated costs and hourly updates are not permitted.

The following information is presented on the Schedule Detail Updates web page:

- **No Load Cost (\$/hour)** – No Load cost is the hourly fixed cost (or price), expressed in \$/hr, to run the generating unit at zero net output, as established by the CDS. It can include hourly No Load costs and other fixed costs. The default value is \$0.00.
- **Cold Startup Cost (\$)** – The dollars per Startup when the unit is in a cold temperature state, as established by the CDS. The default value is \$0.00.
- **Intermediate Startup Cost (\$)** – The dollars per Startup when the unit is in an intermediate temperature state, as established by the CDS. The default is \$0.00.
- **Hot Startup Cost (\$)** – The dollars per Startup when the generating unit is in a hot temperature state, as established by the Cost Development Subcommittee (CDS). The default is \$0.00.
- **Minimum Runtime** – The minimum number of hours a unit must run, in real-time operations, from the time the unit is put online to the time the unit is shut down (as measured by PJM's state estimator). This value cannot be changed for hours where the unit is committed.
- **Notification Time** – The time interval, in hours, between PJM notification and the start sequence of a generating unit. This value overwrites the daily scheduled value for cold, intermediate, or hot notification time.
- **Status** – The status indicates the commitment status of the unit, whether it has been committed in the Day-Ahead market, during the Reliability Run, or in Real Time.

Steps (from the left navigation bar):

Select **Generator**.

Select **Schedules**.

Select the **Detail Updates** tab.

The Schedule Detail Update web page appears.

Click the Market Day calendar to select the date.

Select the desired portfolio from the Portfolio list.

The generating units for the selected portfolio appear in the Location list.

Select the generating unit from the Location list.

The schedules for the selected generating unit appear in the Schedules list.

Select the desired schedule from the Schedules list.

Data for the selected schedule's information appears on the Schedule Detail web page.

Enter desired changes to the following Startup and No-Load data:

- No Load Cost (\$/hr)
- Cold Startup Cost (\$)
- Intermediate Startup Cost (\$)
- Hot Startup Cost (\$)
- Minimum Runtime (hour)
- Notification Time (hour)

Click the **Save** button.

"Success: Save successful" message is displayed.

To download selected information, click the **XML** or **CSV** report buttons.

The file is downloaded to your specified local directory, or you can open it to view in a separate browser window.

6.5 Set Use Startup No Load Switch to Available

The generation owner determines whether PJM should use the Startup and No-Load information for a price-based unit on a daily basis. This is accomplished by marking the Use Startup No Load switch available and unavailable on the Schedule Detail web page. The Startup and No-Load prices for a price-based unit can only change during the open enrollment period and remain in effect for the duration of the period. However, the Use Startup No Load switch can be set each day.

The following information is presented on the Schedule Detail web page:

Use Startup No Load — Indicates whether PJM should use the price-based Startup and No-Load values in the scheduling process. This data item is not applicable for cost-based schedules.

Yes – PJM should use the Startup and No-Load information for the selected schedule.

No – PJM should not use the Startup and No-Load data elements. This is the default.

Steps (from the left navigation bar):

Select **Generator**.

Select **Schedules**.

Select the **Detail** tab.

The Schedule Detail web page appears.

Click the Market Day calendar to select the date.

Select the desired portfolio from the Portfolio list.

The generating units for the selected portfolio appear in the Location list.

Select the generating unit from the Location list.

The schedules for the selected generating unit appear in the Schedules list.

Select the desired schedule from the Schedules list.

Data for the selected schedule's information appears on the Schedule Detail web page.

Click the Use Startup No Load field.

*A dropdown box appears with choices of **true** and **false**.*

Click on *true* to select:

Click the **Save** button.

"Success: Save successful" message is displayed.

To download selected information, click the **XML** or **CSV** report buttons.

The file is downloaded to your specified local directory, or you can open it to view in a separate browser window.

6.6 Set Use Startup No Load Switch to Unavailable

The Operating Company determines whether PJM should use the Startup and No-Load information for a price-based unit. This is accomplished by marking the Use Startup No Load switch available and unavailable on the Schedule Detail web page. The Startup costs and No-Load cost for priced-based units with cost-based Startup costs can change daily. The Startup costs and No Load for price-based units with price-based Startup costs can only be changed during the open enrollment period and remain in effect for the duration of the period. The Operating Company indicates on the Unit Detail webpage if a priced-based unit's Startup cost is price-based or cost-based.

However, the Use Startup No Load switch can be set each day.

The following information is presented on the Schedule Detail web page:

Use Startup No Load — Indicates whether PJM should use the price-based Startup and No-Load values in the scheduling process. This data item is not applicable for cost-based schedules.

Yes – PJM should use the Startup and No-Load information for the selected schedule.

No – PJM should not use the Startup and No-Load data elements. This is the default.

Steps (from the left navigation bar):

Select **Generator**.

Select **Schedules**.

Select the **Detail** tab.

The Schedule Detail web page appears.

Click the Market Day calendar to select the date.

Select the desired portfolio from the Portfolio list.

The generating units for the selected portfolio appear in the Location list.

Select the generating unit from the Location list.

The schedules for the selected generating unit appear in the Schedules list.

Select the desired schedule from the Schedules list.

Data for the selected schedule's information appears on the Schedule Detail web page.

Click the Use Startup No Load field.

*A dropdown box appears with choices of **true** and **false**.*

Click on *false* to select:

Click the **Save** button.

"Success: Save successful" message is displayed.

To download selected information, click the **XML** or **CSV** report buttons.

The file is downloaded to your specified local directory, or you can open it to view in a separate browser window.

6.7 Change Energy Market Opportunity Cost Component, Startup & No Load Offers for Cost-based Schedules

Energy Market Opportunity cost component is a field used to notify PJM that a unit with environmentally limited runtime restrictions has added an opportunity cost component calculated per the rules in PJM Manual 15: Cost Development Guidelines and outlined in the Open Access Transmission Tariff (OATT). The Opportunity Cost field is only available for cost-based offers and Markets Gateway does not add the component in; the participant must include this already in their schedule offer. Use the Schedule Detail web page to change the opportunity cost component for a cost-based schedule.

The Startup and No Load offers for cost-based schedules can occur at any time. Use the Schedule Detail web page to change the Startup and No-Load costs for a cost-based schedule. The following rules apply to Startup and No Load offers for cost-based schedules:

Generally, Cold Startup Cost must be greater than or equal to Intermediate Startup Cost, and Intermediate Startup Cost must be greater than or equal to Hot Startup Cost:

$\text{Cold Startup Cost} \geq \text{Intermediate Startup Cost} \geq \text{Hot Startup Cost}$

However, effective June 1, 2023, as part of the calculation of cost-based Startup Costs, Soak time costs can be included in the Startup Cost, and as such, there will be no need to validate any Startup Costs relative to other Startup Costs. This means that Cold Startup Cost can be less than Intermediate Startup Cost or Hot Startup Cost, and Intermediate Startup Cost can be less than Hot Startup Cost.

The following information is presented on the Schedule Detail web page:

- **Hot Startup Cost (\$)** – The dollars per Startup when the generating unit is in a hot temperature state, as established by the Cost Development Subcommittee (CDS). The default is \$0.00.

- **Intermediate Startup Cost (\$)** – The dollars per Startup when the unit is in an intermediate temperature state, as established by the CDS. The default is \$0.00.
- **Cold Startup Cost (\$)** – The dollars per Startup when the unit is in a cold temperature state, as established by the CDS. The default value is \$0.00.
- **No Load Cost (\$/hour)** – No Load cost is the hourly fixed cost (or price), expressed in \$/hr, to run the generating unit at zero net output, as established by the CDS. It can include hourly No Load costs and other fixed costs. The default value is \$0.00.
- **Opportunity Cost Component (\$/MWh)** – This is the calculated opportunity cost adder for cost offers only, as established by the CDS in PJM Manual 15: Cost Development Guidelines. The default value is null.

Steps (from the left navigation bar):

Select **Generator**.

Select **Schedules**.

Select the **Detail** tab.

The Schedule Detail web page appears.

Click the Market Day calendar to select the date.

Select the desired portfolio from the Portfolio list.

The generating units for the selected portfolio appear in the Location list.

Select the generating unit from the Location list.

The schedules for the selected generating unit appear in the Schedules list.

Select the desired schedule from the Schedules list.

Data for the selected schedule's information appears on the Schedule Detail web page.

Enter desired changes to the following Startup and No-Load data:

- Hot Startup Cost (\$)
- Intermediate Startup Cost (\$)
- Cold Startup Cost (\$)
- No Load Cost (\$/hr)

Click the **Save** button.

"Success: Save successful" message is displayed.

To download selected information, click the **XML** or **CSV** report buttons.

The file is downloaded to your specified local directory, or you can open it to view in a separate browser window.

6.8 Hourly Startup & No Load Offers for Cost-based Schedules

A unit has the ability to submit hourly differentiated Startup and No-Load costs for cost-based schedules, as well the ability to update them on an hourly basis. The hourly differentiated costs and hourly updates overwrite any values

written on the Schedule Detail page. Hourly updates can be made for any hours, regardless of commitment status. The following rules apply to Startup offers for cost-based schedules:

Cold Startup Cost $\geq$ Intermediate Startup Cost $\geq$ Hot Startup Cost

The following information is presented on the Schedule Detail Updates web page:

- **No Load Cost (\$/hour)** – No Load cost is the hourly fixed cost (or price), expressed in \$/hr, to run the generating unit at zero net output, as established by the CDS. It can include hourly No Load costs and other fixed costs. The default value is \$0.00.
- **Cold Startup Cost (\$)** – The dollars per Startup when the unit is in a cold temperature state, as established by the CDS. The default value is \$0.00.
- **Intermediate Startup Cost (\$)** – The dollars per Startup when the unit is in an intermediate temperature state, as established by the CDS. The default is \$0.00.
- **Hot Startup Cost (\$)** – The dollars per Startup when the generating unit is in a hot temperature state, as established by the Cost Development Subcommittee (CDS). The default is \$0.00.
- **Minimum Runtime** – The minimum number of hours a unit must run, in real-time operations, from the time the unit is put online to the time the unit is shut down (as measured by PJM's state estimator). This value cannot be changed for hours where the unit is committed.
- **Notification Time** – The time interval, in hours, between PJM notification and the start sequence of a generating unit. This value overwrites the daily scheduled value for cold, intermediate, or hot notification time.
- **Status** – The status indicates the commitment status of the unit, whether it has been committed in the Day-Ahead market, during the Reliability Run, or in Real Time.

Steps (from the left navigation bar):

Select **Generator**.

Select **Schedules**.

Select the **Detail Updates** tab.

The Schedule Detail Update web page appears.

Click the Market Day calendar to select the date.

Select the desired portfolio from the Portfolio list.

The generating units for the selected portfolio appear in the Location list.

Select the generating unit from the Location list.

The schedules for the selected generating unit appear in the Schedules list.

Select the desired schedule from the Schedules list.

Data for the selected schedule's information appears on the Schedule Detail web page.

Enter desired changes to the following Startup and No-Load data:

- No Load Cost (\$/hr)
- Cold Startup Cost (\$)
- Intermediate Startup Cost (\$)

- Hot Startup Cost (\$)
- Minimum Runtime (hour)
- Notification Time (hour)

Click the **Save** button.

“Success: Save successful” message is displayed.

To download selected information, click the **XML** or **CSV** report buttons.

The file is downloaded to your specified local directory, or you can open it to view in a separate browser window.

6.9 Modify Startup Notification Times

Startup notification times are changed on a schedule-basis, regardless of whether the schedule is cost-based or price-based. Hourly updates can be made on the Schedule Detail Updates screen, which is described in Section 8.8 of this guide. The following rules apply to entering Startup and notification data:

- Hot to Cold Time $\geq$ Hot to Intermediate Time
- Cold Notification Time $\geq$ Intermediate Notification Time $\geq$ Hot Notification Time
- Cold Startup Time $\geq$ Intermediate Startup time $\geq$ Hot Startup Time

The following information can be changed on the Schedule Detail page and apply for an entire operating day:

Time Section:

- **Cold Notification (hour)** – The time interval between PJM notification and the start sequence of a generating unit that is currently in its cold temperature state. The default value is 0 hours.
- **Cold Notification Limit** – This field is read-only for users and represents the parameter limit outlined in Section 10 of this guide.
- **Intermediate Notification (hour)** – The time interval between PJM notification and the start sequence of a generating unit that is currently in its intermediate temperature state. The default value is 0 hours.
- **Intermediate Notification Limit** – This field is read-only for users and represents the parameter limit outlined in Section 10 of this guide.
- **Hot Notification (hour)** – The time interval between PJM notification and the start sequence of a generating unit that is currently in its hot temperature state. The default value is 0 hours.
- **Hot Notification Limit** – This field is read-only for users and represents the parameter limit outlined in Section 10 of this guide.
- **Hot-To-Cold (hour)** – The amount of time, in hours, after shutdown that a hot temperature state unit takes to cool down to cold temperature state. The default value is 0 hours.
- **Cold Startup (hour)** – The time interval, measured in hours, from the actual unit start sequence to the unit breaker close for a generating unit in its cold temperature state. The default value is 0 hours.
- **Cold Startup Limit** – This field is read-only for users and represents the parameter limit outlined in Section 10 of this guide.
- **Intermediate Startup (hour)** – The time interval, measured in hours, from the actual unit start sequence to the breaker close for a generating unit in its intermediate temperature state. The default value is 0 hours.

- **Intermediate Startup Limit** – This field is read-only for users and represents the parameter limit outlined in Section 10 of this guide.
- **Hot Startup Time (hour)** – The time interval, measured in hours, from the actual unit start sequence to the breaker close for a generating unit in its hot temperature state. The default value is 0 hours.
- **Hot Startup Time Limit** – This field is read-only for users and represents the parameter limit outlined in Section 10 of this guide.
- **Hot to Intermediate Time (hour)** – The amount of time, in hours, after shutdown that a hot temperature state unit takes to cool down to intermediate temperature state. The default value is 0 hours.

Extended Cold Section:

- **Extended Cold Notification Time (hour)** – The amount of advance notice, in hours, required to notify the operating company to prepare the unit to operate in synchronous condensing mode due to a PJM emergency. The default value is NULL.
- **Reason** – When the Generator enables the Extended Cold Startup and Notification Time and the total value between these two columns is greater than the TTS Tolerance the generator must supply an explanation.
- **Extended Cold Startup Time (hour)** – The time interval, measured in hours, from the actual unit start sequence to the unit breaker close for a generating unit in its cold temperature state due to a PJM emergency. The default value is 0 hours.
- **End Day** – The Generator's explanation is valid for exceeding the TTS Tolerance until this termination date.

Other Section:

- **Time To Start Tolerance (hour)** – This is a value supplied by PJM's MMU that is validated upon enabling the "Use Extended Cold" on the Unit → Unit Detail tab.

Steps (from the left navigation bar):

Select **Generator**.

Select **Schedules**.

Select the **Detail** tab.

The Schedule Detail web page appears.

Click the Market Day calendar to select the date.

Select the desired portfolio from the Portfolio list.

The generating units for the selected portfolio appear in the Location list.

Select the generating unit from the Location list.

The schedules for the selected generating unit appear in the Schedules list.

Select the desired schedule from the Schedules list.

Data for the selected schedule's information appears on the Schedule Detail web page.

Enter the desired changes to the following notification times:

- Hot to Cold Time (hour)
- Hot to Intermediate Time (hour)

- Hot Notification Time (hour)
- Intermediate Notification Time (hour)
- Cold Notification Time (hour)
- Hot Startup Time (hour)
- Intermediate Startup Time (hour)
- Cold Startup Time (hour)
- Extended Cold Notification Time (hour)
- Extended Cold Startup Time (hour)
- Extended Reason (if required)
- Extended Cold End Day (if required)

Click the **Save** button.

“Success: Save successful” message is displayed.

To download selected information, click the **XML** or **CSV** report buttons.

The file is downloaded to your specified local directory, or you can open it to view in a separate browser window.

7.0 Managing Condenser Data

7.1 Condenser Data Overview

The MUI is also used to manage condenser data, including the cost to start the unit in condensing mode, the cost of transitioning a condenser to the generating mode, the power requirement and the notification time. Condenser data is submitted on a unit basis.

7.2 Which Web Pages Do I Use?

The following web pages are used to view and manage condenser data:

- **Unit Detail** – Use this web page to view and modify default condenser data.
- **Synchronized Offers** – Use this web page to view and modify condenser data.

7.3 Set Condenser Switch to Available

The generating unit owner can determine whether the generating unit is available to condense on a unit basis. This is accomplished by marking the Condense Available switch available and unavailable on the Unit Detail web page.

The following information is presented on the Unit Detail web page:

Condense Available – Indicates whether a unit is available to condense.

Yes – Indicates the unit is available to condense.

No – Indicates the unit is not available to condense.

Steps (from the left navigation bar):

Select **Generator**.

Select **Unit**.

Select the **Detail** tab.

The Unit Detail web page appears.

Click the Market Day calendar to select the date.

Select the desired portfolio from the Portfolio list.

The generating units for the selected portfolio appear in the Location list.

Select the generating unit from the Location list.

The data for the selected generating unit appears on the Unit Detail web page.

Scroll vertically to the Condense section of the page.

Click in the checkbox adjacent to the field labelled *Available* to insert a checkmark.

Click the **Save** button.

“Success: Save successful” message is displayed.

To download selected information, click the **XML** or **CSV** report buttons.

The file is downloaded to your specified local directory, or you can open it to view in a separate browser window.

7.4 Set Condenser Switch to Unavailable

The Operating Company can determine whether the generating unit is available to condense on a Unit basis. This is accomplished by marking the Condense Available switch available or unavailable on the Unit Detail web page.

The following information is presented on the Unit Detail web page:

Condense Available — Indicates whether a unit is available to condense.

Yes – Indicates the unit is available to condense.

No – Indicates the unit is not available to condense.

Steps (from the left navigation bar):

Select **Generator**.

Select **Unit**.

Select the **Detail** tab.

The Unit Detail web page appears.

Click the Market Day calendar to select the date.

Select the desired portfolio from the Portfolio list.

The generating units for the selected portfolio appear in the Location list.

Select the generating unit from the Location list.

The data for the selected generating unit appears on the Unit Detail web page.

Scroll vertically to the Condense section of the page.

Click in the checkbox adjacent to the field labelled *Available* to remove the check mark.

Click the **Save** button.

“Success: Save successful” message is displayed.

To download selected information, click the **XML** or **CSV** report buttons.

The file is downloaded to your specified local directory, or you can open it to view in a separate browser window.

7.5 Updating Condenser Constraint Data

Condenser constraint data is modified on a unit basis. The following condenser information can be modified using the Unit Detail web page:

Available – Indicates if the unit is available to operate in the condenser mode for energy.

Condense Energy Usage (MW) – This is the amount of energy a condensing unit consumes in an hour while operating in the condensing mode.

Condense To Notification Time (hour) – The amount of advance notice, in hours, required to notify the operating company to prepare the unit to operate in synchronous condensing mode. The default value is 0 hours.

Condense Startup Cost (\$) – The offer price, in dollars, for starting up the unit to run in synchronous condensing mode. Offer price is capped at cost, as established by the Cost Development Subcommittee CDS. The default value is \$0.00.

Condense To Generation Cost (\$) – The cost, in dollars, of transitioning a condenser to the generating mode. The value submitted for this cost must be less than or equal to the condense Startup cost. The default value is \$0.00.

Condense Hourly Cost (\$/hr) - The offer price, in dollars/hour, to run the unit in the synchronous condensing mode. Offer price for condensing is capped at cost, as established by the CDS. The default value is \$0.00.

Condense To Generate Time – The amount of time in hours it takes for the unit to be available to generate once it's in a condense mode.

Reserve as Condenser – The capability to operate in synchronized condense mode for the purposes of reserve. (This is independent of selecting 'Available')

Steps (from the left navigation bar):

Select **Generator**.

Select **Unit**.

Select the **Detail** tab.

The Unit Detail web page appears.

Click the Market Day calendar to select the date.

Select the desired portfolio from the Portfolio list.

The generating units for the selected portfolio appear in the Location list.

Select the generating unit from the Location list.

The data for the selected generating unit appears on the Unit Detail web page.

Scroll vertically to the **Condense** section of the page.

Enter the desired changes to the following constraint data:

- To Notification Time
- Energy Usage
- Startup Cost
- To Generation Cost
- Hourly Cost

Click the **Save** button.

"Success: Save successful" message is displayed.

To download selected information, click the XML or CSV report buttons.

The file is downloaded to your specified local directory, or you can open it to view in a separate browser window.

7.6 Use of Extended Cold Notification Time

The user determines whether PJM should use the Extended Cold Information during a PJM declared emergency on a daily basis. This is accomplished by updating the Extended Notification Values and enabling the use of the Extended notification values.

The following information is presented on the Unit Detail web page:

Use Extended Cold – Indicates whether PJM should use the Extended Cold Notification in the scheduling process. This data item is not applicable for cost-based schedules.

Yes – PJM should use the Extended Cold information for the selected schedule.

No – PJM should NOT use the Extended Cold information. This is the default.

Steps (from the left navigation bar):

Select **Generator**.

Select **Unit**.

Select the **Detail** tab.

The Unit Detail web page appears.

Click the Market Day calendar to select the date.

Select the desired portfolio from the Portfolio list.

The generating units for the selected portfolio appear in the Location list.

Select the generating unit from the Location list.

The data for the selected generating unit appears on the Unit Detail web page.

Scroll vertically to the **Miscellaneous** section of the page.

Click in the checkbox adjacent to the field labelled *Use Extended Cold* to insert a check mark.

Click the **Save** button.

“Success: Save successful” message is displayed.

To download selected information, click the XML or CSV report buttons.

The file is downloaded to your specified local directory, or you can open it to view in a separate browser window.

Update Extended Cold Notification – Before enabling the use of extended notification, you MUST update Extended Notification information for all available schedules on the Schedule Details tab.

Steps (from the left navigation bar):

Select **Generator**.

Select **Schedules**.

Select the **Detail** tab.

The Schedules Detail web page appears.

Click the Market Day calendar to select the date.

Select the desired portfolio from the Portfolio list.

The generating units for the selected portfolio appear in the Location list.

Select the generating unit from the Location list.

Select the unit Schedule from the Schedule list.

The data for the selected unit schedule appears on the Schedule Detail web page.

Scroll vertically to the **Extended Cold** section of the page.

Enter the desired changes to the following:

- Extended Cold Notification Time
- Reason
- Extended Cold Startup Time
- End Day

Click the **Save** button.

“Success: Save successful” message is displayed.

To download selected information, click the XML or CSV report buttons.

The file is downloaded to your specified local directory, or you can open it to view in a separate browser window.

8.0 Managing Generating Unit Schedules

8.1 Generating Unit Schedules Overview

Managing generating unit schedules is accomplished by performing the following general tasks:

- Create or modify a type of schedule.
- Modify schedule-specific data, which includes MW operating limits and constraint data.
- Create schedule-specific data, which includes Operational restrictions and Dual fuel availability.
- Define Energy Fuel Type and Startup Fuel Type (both required beginning 4/1/15)
- Create or modify schedule offer data (MW and price), including hourly offer updates (MW and price)
- Select schedule(s) to be available.
- Create and modify Real Time schedule availability.

8.2 Which Web Pages Do I Use?

The following web pages are used to view and manage generating unit schedules:

- **Offers** – Use this web page to view and modify schedule segment offers.
- **Offer Updates** – Use this web page to view and modify hourly schedule segment offers.
- **Detail** – Use this web page to view and modify schedule parameters, such as unit Startup costs, condensing information, cancellation costs, energy fuel type, Startup fuel type, and market participation.
- **Detail Updates** – Use this web page to view and modify hourly schedule parameters, such as unit Startup costs and No-Load costs.
- **Manager** – Use this web page to create types of schedules. Schedules are limited to 10 cost-based schedules, one price-based schedule, and one price PLS schedule.
- **Selection** – Use this web page to select generating unit schedules.
- **Availability Update** – Use this web page to communicate the intention of operating as cost-based in real time and updating schedule availability in real time.
- **Restriction Information** – Use this web page to communicate restrictions that may limit run time and dual fuel availability parameters.
- **TPS Schedule Switch** – Use this web page to view if any schedules have switched based on the results of the three pivotal supplier test. This web page is read-only.
- **Fuel Price Exceptions** – Use this web page to submit any fuel price exception requests for submitted offers greater than \$1,000/MWh that failed the initial offer verification automated screen.
- **Composite Offer Verification** – Use this web page to review information for Fast-Start Resources if the Composite Energy Offer is above \$1,000/MWh at Economic Maximum. This web page is read-only.

8.3 Create a New Schedule Type

Generation users can define more than one schedule for a generating unit. To assist in creating multiple schedules for a generating unit, the Schedule Manager web page allows you to assign a schedule name and a description to a specific generating unit schedule.

The following information is defined for each schedule:

Schedule Name – A short name for the generating unit's schedule, defined by the operating company. This label appears in the Schedules List on the Generation web pages.

Schedule Description – A description of the generating unit's schedule, defined by the Operating Company. This label appears in the Generation by Portfolio web page, which presents the Day-Ahead market results by generation portfolio.

Schedule Type – identifies the number and type of schedule, as follows:

- 1-12 – cost-based schedules
- 79 – price-based parameter limited schedule
- 99 – price-based schedule

Steps (from the left navigation bar):

Select **Generator**.

Select **Schedules**.

Select the **Manager** tab.

The Schedules Manager web page appears.

Click the Market Day calendar to select the date. **Note:** In order to add a new schedule, you will have to select a future market date.

Select the desired portfolio from the Portfolio list.

The generating units for the selected portfolio appear in the Location list.

Select the generating unit from the Location list.

The data for the selected unit schedule appears on the Schedule Manager web page.

Right click in the portion of the screen below the column headings to display the **Add Item** action button.

Left click on the **Add Item** menu option to open a new schedule data entry line.

On the new schedule data entry line, enter text into the following fields:

- Schedule Name
- Schedule Description

On the new schedule data entry line, choose from the drop down for the following field:

- Schedule Type

Click the **Save** button.

“Success: Save successful” message is displayed.

The new row with the chosen Schedule Name, Description and Type will display.

To download selected information, click the **XML** or **CSV** report buttons.

The file is downloaded to your specified local directory, or you can open it to view in a separate browser window.

8.4 Modify a Schedule Type

After a schedule type is created, you can modify some of the parameters. The following information is defined for each schedule:

Schedule Name — A short name for the generating unit's schedule, defined by the operating company. This label appears in the Schedules List on the Generation web pages.

Schedule Description — A short name for the generating unit's schedule, defined by the operating company. This label appears in the Schedules Selector List on the Generation web pages. This label appears in the Generation by Portfolio web page, which presents the Day-Ahead market results by generation portfolio.

After a schedule type is created and saved to the database, you cannot modify the Type field.

Steps (from the left navigation bar):

Select **Generator**.

Select **Schedules**.

Select the **Manager** tab.

The Schedules Manager web page appears.

Click the Market Day calendar to select the date.

Select the desired portfolio from the Portfolio list.

The generating units for the selected portfolio appear in the Location list.

Select the generating unit from the Location list.

The existing schedule types for the selected generating unit display on the Manager web page.

Double click on the Schedule to be modified.

The selected schedule line is available for modifications.

On the selected schedule line, modify text in either of the following fields:

- Schedule Name
- Schedule Description

Click the **Save** button.

"Success: Save successful" message is displayed.

The row with the modified Schedule Name and/or Description will display.

To download selected information, click the **XML** or **CSV** report buttons.

The file is downloaded to your specified local directory, or you can open it to view in a separate browser window.

8.5 Delete a Schedule Type

After a schedule type is created, currently, you will not be allowed to delete it from the Markets database.

8.6 Modify Schedule Operating Limits

The Schedule Detail web page presents schedule-specific data that can be modified on a schedule basis. The operating limits that are defined on a schedule basis override the operating limits that are defined on a unit basis (except for Unit Hourly Updates).

The following operating limits can be overridden on a schedule basis using the Schedule Detail web page:

Emergency Max (MW) – The MW energy level at which the operating company operates the generating unit once PJM requests Maximum Emergency Generation. This represents the highest short-term MW level a generating unit can produce and may require extraordinary procedures to produce the desired output. This is the override to the default Emergency Max Limit (as defined on the Unit Detail web page) for this schedule.

Economic Max (MW) – The maximum energy available from the unit for economic dispatch. This is the override to the default Economic Max Limit (as defined on the Unit Detail web page) for this schedule.

Economic Min (MW) – The minimum energy available from the unit for economic dispatch. CTs are permitted to provide an Economic Minimum Limit less than the physical economic minimum value of the unit. This is the override to the default Economic Minimum Limit (as defined on the Unit Detail web page) for this schedule. For a wind resource, the Economic Min must be less than or equal to the resource's CIR value. Submitting a value greater than the CIR value will trigger a warning message indicating that the Economic Min value will be capped at the CIR value in the Real Time market clearing engine.

Emergency Min (MW) – The lowest level of energy in MW the unit can produce and maintain a stable level of operation. The Operating Company operates the unit at this level during a Minimum Generation Emergency. This is the override to the default Emergency Minimum Limit (as defined on the Unit Detail web page) for this schedule. For a wind resource, this value must be less than or equal to the resource's CIR value. Submitting a value greater than the CIR value will trigger a warning message indicating that the Economic Min value will be capped at the Emergency Min value in the Real Time market clearing engine.

Steps (from the left navigation bar):

Select **Generator**.

Select **Schedules**.

Select the **Detail** tab.

The Schedules Detail web page appears.

Click the Market Day calendar to select the date.

Select the desired portfolio from the Portfolio list.

The generating units for the selected portfolio appear in the Location list.

Select the generating unit from the Location list.

Select the desired schedule from the Schedules List.

The schedule detail for the selected schedule appears.

Scroll vertically to the **Economic & Emergency** section of the page.

Select and enter data for the following operating limits:

- Emergency Max (MW)
- Economic Max (MW)
- Economic Min (MW)
- Emergency Min (MW)

Click the **Save** button.

“Success: Save successful” message is displayed.

To download selected information, click the **XML** or **CSV** report buttons.

The file is downloaded to your specified local directory, or you can open it to view in a separate browser window.

8.7 Modify Schedule Constraint Data

Unit constraint data is defined on a schedule basis. Constraint data includes minimum downtime, minimum runtime, maximum runtime, maximum weekly starts, maximum daily starts and maximum weekly energy. The following rules apply to entering constraint data:

Maximum Daily Starts $\leq$ Maximum Weekly Starts

The following constraint data can be modified using the Schedule Detail web page:

Minimum Downtime (hour) – The minimum number of hours between starts, calculated as the difference between when the unit shuts-down and the next time the unit is put online, as measured by telemetry available to PJM. The default value is 0 hours.

Minimum Runtime (hour) – The minimum number of hours a unit must run, in real-time operations, from the time the unit is put online to the time the unit is shut down (as measured by PJM's state estimator). In the Day-Ahead scheduling process, it is calculated as the number of consecutive committed hours. The default value is 0 hours.

Maximum Weekly Starts – The maximum number of times a unit can be started in one week under normal operating conditions (168-hour period starting Monday 0001 hour). The default value is infinity.

Maximum Runtime (hour) – The maximum number of hours a unit can run within a day. In the Day-Ahead Scheduling process, it is calculated as the total number of hours a unit is committed. The default value is infinity.

Maximum Daily Starts – The maximum number of times that a unit can be started in a day under normal operating conditions. The default value is one start.

Maximum Weekly Energy (MWh) – The maximum amount of energy, reported in MWh, that the unit can produce in one week used for study purposes. The default value is 0.0 MWh. If unit is fuel limited, it is recommended that his value be set to the default and run time restrictions be bid using the Maximum Run Time parameters.

Steps (from the left navigation bar):

Select **Generator**.

Select **Schedules**.

Select the **Detail** tab.

The Schedules Detail web page appears.

Click the Market Day calendar to select the date.

Select the desired portfolio from the Portfolio list.

The generating units for the selected portfolio appear in the Location list.

Select the generating unit from the Location list.

Select the desired schedule from the Schedules List.

The schedule detail for the selected schedule appears.

Scroll vertically to the **Limits** section of the page.

Modify data for the following constraint data:

- Minimum Downtime (hour)
- Minimum Runtime (hour)
- Maximum Weekly Starts
- Maximum Runtime (hour)
- Maximum Daily Starts
- Maximum Weekly Energy (MWh)

Click the **Save** button.

“Success: Save successful” message is displayed.

To download selected information, click the **XML** or **CSV** report buttons.

The file is downloaded to your specified local directory, or you can open it to view in a separate browser window.

8.8 Modify Hourly Schedule Parameters

The Schedule Detail Updates web page displays the schedule-specific data that can be modified on an hourly schedule basis. The operating parameters that are defined on an hourly schedule basis override the operating parameters that are defined on a schedule basis.

Units that elect cost-based Startup and No-Load costs can create hourly Detail Updates. Units that elect price-based Startup and No-Load costs cannot create hourly Detail Updates.

The following operating parameters can be overridden on an hourly schedule basis using the Schedule Detail Updates web page:

No Load Cost (\$/hour) – No Load cost is the hourly fixed cost (or price), expressed in \$/hr, to run the generating unit at zero net output, as established by the Cost Development Subcommittee (CDS). It can include hourly No Load costs and other fixed costs. The default value is \$0.00.

Cold Startup Cost (\$) – The dollars per Startup when the generating unit is in a cold temperature state, as established by the CDS. The default value is \$0.00.

Intermediate Startup Cost (\$) – The dollars per Startup when the generating unit is in an intermediate temperature state, as established by the CDS. The default value is \$0.00.

Hot Startup Cost (\$) – The dollars per Startup when the generating unit is in a hot temperature state, as established by the CDS. The default value is \$0.00.

Minimum Runtime – The minimum number of hours that the unit must run for the selected schedule during real-time.

Notification Time – The number of hours that the unit owner must be notified prior to bringing the unit online in real-time energy market.

Reference Schedule – The reference schedule will be used in the following scenarios (but not limited to):

- a) The reference cost schedule to use when the price schedule is approved to exceed the \$1000 pricing limit.
- b) For Dual Fuel resources, the reference schedule should be updated to report the Cost Schedule ID of the fuel that is the basis of the hourly offers. See Real-Time Scenario number 4 in the Intraday Offers (IDO) FAQ document.

Steps (from the left navigation bar):

Select **Generator**.

Select **Schedules**.

Select the **Detail Updates** tab.

The Schedule Detail Updates web page appears.

Click the Market Day calendar to select the date.

Select the desired portfolio from the Portfolio list.

The generating units for the selected portfolio appear in the Location list.

Select the generating unit from the Location list.

Select the desired schedule from the Schedules List.

The data for the selected unit schedule appears on the Schedule Detail Updates web page.

Left click on a specific hour to highlight that hour.

On the new hourly offer updates data entry line, enter values into the following fields:

- No Load Cost
- Cold Startup Cost
- Intermediate Startup Cost
- Hot Startup Cost
- Minimum Runtime
- Notification Time
- Reference Schedule

Right-click on the hourly line segment to either Copy Default values or Copy Hour.

Left click on another specific hour to Paste To Hour (can select multiple hours at once).

Click the **Save** button.

“Success: Save successful” message is displayed.

The new segment with the desired No Load and Startup costs will display for the selected hour.

To download selected information, click the **XML** or **CSV** report buttons.

The file is downloaded to your specified local directory, or you can open it to view in a separate browser window.

8.9 Create Operational Restrictions and Communicate Dual Fuel Availability

The Schedules Restriction Information web page allows users to communicate any operational restrictions, in free form, on a schedule basis, that may limit runtime (hours). Selectable unit restrictions must now be made on the Generator Unit Limitations tab, but the “Operational Restriction Other” box can still be used for Capacity Performance Exceptions. The Restriction Information tab also allows participants to select Pipeline Switching information in the event of any credible gas contingency.

Resources that are part of a credible gas pipeline contingency(s) are not eligible to provide Reserves, as determined by PJM Dispatch, depending on the severity of the contingency and other system conditions in order to ensure system reliability is maintained.

In order for a unit to be Dual Fuel Available, it must first set the Dual Fuel Capability flag under the Unit Detail web page. Details can be found in section 6.0 of this guide. For units that are Dual Fuel capable, the following data may be entered:

Operational Restriction Other – A free-form field where a response, not longer than 80 characters (any text), can be entered.

Dual Fuel Availability – Whether an alternate fuel is available if the unit is close to expending the current fuel and wishes to switch to an alternate.

Time to Transition – The time in minutes the unit needs to make that switch.

MW’s to Transition – The MW output the unit must operate at to facilitate the fuel switch.

Pipeline Switching – The selection of appropriate gas pipelines available to the unit, from A through D.

Transition Time (mins) – The transition time, in minutes, to switch from pipeline A to pipeline B, C, or D.

Transition MW – The MW’s to transition from pipeline A to pipeline B, C, or D.

Current Firm Nomination (Dths) – The current firm nomination, in Decatherms, for the pipeline or LDC.

Current Total Nomination (Dths) – The total current nomination, in Decatherms, for the pipeline or LDC.

No Nomination Reason – The reason for no gas pipeline/LDC nomination (i.e. no fuel available, no-notice service, nomination pending).

Steps (from the left navigation bar):

Select **Generator**.

Select **Schedules**.

Select the **Restriction Information** tab.

The Operational Restrictions, Dual Fuel, and Pipeline Switching web page appears.

Click the Market Day calendar to select the date.

Select the desired portfolio from the Portfolio list.

The generating units for the selected portfolio appear in the Location list.

Select the generating unit from the Location list.

Select the desired schedule from the Schedules List.

The schedule restriction info for the selected schedule appears.

Modify the Schedule Restriction Info as follows:

- Enter data for Operational Restriction Other if required.
- For Dual Fuel Availability, select 'Yes' or 'No'.
Note: (Dual Fuel Capability on the Unit > Detail page must be set to Yes in order to select Yes for Availability).
- Enter Time to Transition in minutes (0 to 1440 minutes).
- Enter the MWs to Transition (Can be a value greater than or equal to 0 and less than or equal to 99999).
- Enter Pipeline Switching information from the available dropdown list for pipelines A, B, C, or D.
- Enter Transition Time and Transition MW data from pipeline A to B, C, or D.
- Enter Current Firm Nomination (Dths) data for the appropriate pipeline or LDC, if required.
- Enter the Current Total Nomination (Dths) data for the appropriate pipeline or LDC, if required.
- Enter No Nomination Reason from the dropdown list for the appropriate pipeline or LDC, if necessary.

Click the **Save** button.

"Success: Save successful" message is displayed.

The modified schedule detail is displayed.

To download selected information, click the **XML** or **CSV** report buttons.

The file is downloaded to your specified local directory, or you can open it to view in a separate browser window.

8.10 Define Energy Fuel Type and Startup Fuel Type

Energy Fuel Type and Startup Fuel Type are required inputs for each generator schedule, and a schedule cannot be submitted without these two inputs. Both of these require a fuel type and sub fuel type (for example, Coal | Anthracite or Gas | Natural Gas).

Energy Fuel Type – Fuel used to achieve full load for the generator.

Startup Fuel Type – Fuel used to ignite or start up the generator.

Steps (from the left navigation bar):

Select **Generator**.

Select **Schedules**.

Select the **Detail** tab.

The Schedules Detail web page appears.

Click the Market Day calendar to select the date.

Select the desired portfolio from the Portfolio list.

The generating units for the selected portfolio appear in the Location list.

Select the generating unit from the Location list.

Select the desired schedule from the Schedules List.

The schedule detail for the selected schedule appears.

Locate the **About** section of the page.

Locate the Energy Fuel Type field.

Click on the arrow of the dropdown to display the list of fuel type | sub fuel type choices.

Click on the desired response.

Locate the Startup Fuel Type field.

Click on the arrow of the dropdown to show the list of fuel type | sub fuel type choices.

Click on the desired response.

Click the **Save** button.

"Success: Save successful" message is displayed.

The modified schedule detail is displayed.

To download selected information, click the **XML** or **CSV** report buttons.

The file is downloaded to your specified local directory, or you can open it to view in a separate browser window.

8.11 Create Daily Schedule Offers

Schedule offers curve consists of MW/price segments. Up to 20 segments can be defined for each schedule.

The first point describes the Economic Minimum Limit of the unit. (The slope is equal to zero.)

The segment between points is a calculated slope or block, depending on the status of the Offer Slope Switch.

The last point is equal to the Emergency Maximum Limit. (The curve is extended, with a slope equal to zero.)

Using the Schedule Offer web page, the following data is entered:

MW – The net MW output associated with this segment. If the last MW point is less than the Maximum Emergency Limit, the curve is extended up to the Emergency Maximum Limit using zero slope from the last incremental point on the curve. The default value is 0.0 MW.

Price – The \$/MW price offer for this segment. The default value is \$0.00. Value may be negative. Additional information on the business rules regarding offer bid caps can be found in **PJM Manual 11: Energy & Ancillary Services Market Operations**.

In addition to providing the MW/Price segments, you need to indicate if an interpolated slope is calculated between segments in a schedule's offer curve. Using the Schedule Detail web page, the following information is required:

Use Offer Slope – Indicates whether an interpolated slope is calculated between segments in a generator offer curve.

✓ – Indicates the offer slope is used to calculate the schedule's offer price.

☐ – Indicates the slope is zero (block-based offer).

Steps (from the left navigation bar):

Select **Generator**.

Select **Schedules**.

Select the **Offers** tab.

The Schedules Offers web page appears.

Click the Market Day calendar to select the date.

Select the desired portfolio from the Portfolio list.

The generating units for the selected portfolio appear in the Location list.

Select the generating unit from the Location list.

Select the schedule from the Schedule list.

The data for the selected unit schedule appears on the Schedule Offers web page.

Right click to display the **Add Item** action button.

Left click to open a new schedule data entry line.

On the new schedule data entry line, enter text into the following fields:

- MW
- Price

Click the **Save** button.

"Success: Save successful" message is displayed.

The new row with the chosen MW and Price will display.

To download selected information, click the **XML** or **CSV** report buttons.

The file is downloaded to your specified local directory, or you can open it to view in a separate browser window.

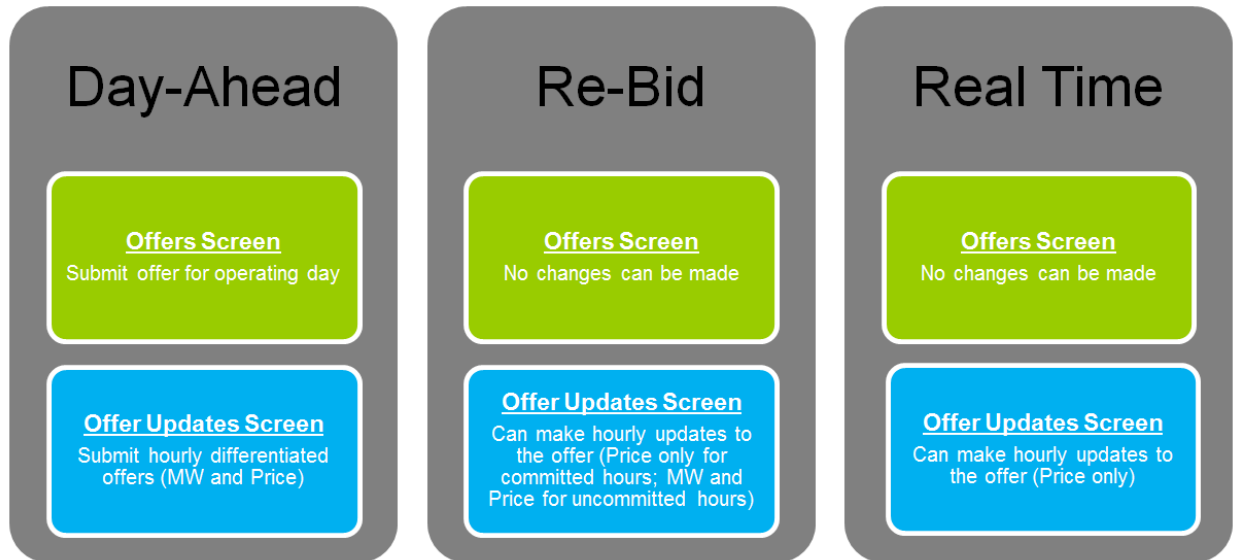
To indicate that you want the offer slope to be used, perform the following Steps (from the left navigation bar):

Left click the Use Offer Slope field.

A ✓ appears in the Use Offer Slope check box.

8.12 Create Hourly Schedule Offers

In order to create hourly differentiated schedule offers for the Day-Ahead Market, a daily schedule offer curve must first be submitted through the Schedule Offers tab. In Real-Time, daily and hourly schedule offers can be updated through the Schedule Offer Updates page. All hourly updates must be made at least 65 minutes prior to the start of the operating hour. You are allowed up to a maximum of 20 segments per hour. Below is a guideline showing which parameters may be updated during which times:



The Day-Ahead market closes at 1100. The Re-Bidding period for the balancing market is from posting of Day-Ahead market results (but not prior to 1200) to 1415 daily. If a unit clears a Day-Ahead position (committed in Day-Ahead), no updates can be made to Offer MW for committed hours. Updates are permitted to the offer price for all hours; however, price schedule offer price cannot be increased for an hour that is committed. If a unit does not clear a Day-Ahead position (not committed in Day-Ahead), the Offer MW is editable through the end of the Re-Bid period (1415), and updates are permitted to the offer price for all uncommitted hours.

If a unit chooses to opt out of Intraday Hourly Offers and they have not entered a Day-Ahead hourly differentiated offer (they only have a Daily Offer) and they have not cleared a Day-Ahead position, during the Re-Bid period the participant may update their daily offer or enter an hourly differentiated offer. After the Re-Bid period is closed, no further updates to the hourly differentiated offer or the daily offer will be allowed.

Using the Schedule Offer Updates web page, you can update the following data:

MW – The net MW output associated with this hourly segment. Updates to the MW value may only be made up to the rebid period the day before the operating day.

Price – The \$/MW price offer for this segment. Additional information on the business rules regarding offer bid caps can be found in **PJM Manual 11: Energy & Ancillary Services Market Operations**.

Steps (from the left navigation bar) for submitting hourly differentiated offers:

Select **Generator**.

Select **Schedules**.

Select the **Offer Updates** tab.

The Offer Updates web page appears.

Click the Market Day calendar to select the date.

Select the desired portfolio from the Portfolio list.

The generating units for the selected portfolio appear in the Location list.

Select the generating unit from the Location list.

Select the schedule from the Schedule list.

The data for the selected unit schedule appears on the Offer Updates web page.

Left click on a specific hour to highlight that hour.

Right-click on that highlighted hour to display the drop-down menu.

Left click on **Add Segment** action button.

On the new hourly offer updates data entry line, enter values into the following fields:

- MW
- Price

To remove a segment, right-click on selected segment, then left-click on **Delete Segment** action button.

Hourly offer curves can be added for one-hour, multiple hours, or all hours. If an hour is not populated, it will default to use the daily offer curve for that hour.

Click the **Save** button.

“Success: Save successful” message is displayed.

The new segment with the chosen MW and Price will display for the selected hour.

To download selected information, click the **XML** or **CSV** report buttons.

The file is downloaded to your specified local directory, or you can open it to view in a separate browser window.

Steps (from the left navigation bar) for submitting hourly offer updates:

Select **Generator**.

Select **Schedules**.

Select the **Offer Updates** tab.

The Offer Updates web page appears.

Click the Market Day calendar to select the date.

Select the desired portfolio from the Portfolio list.

The generating units for the selected portfolio appear in the Location list.

Select the generating unit from the Location list.

Select the schedule from the Schedule list.

The data for the selected unit schedule appears on the Offer Updates web page.

Right-click on any hour to display the drop-down menu.

Left click on **Copy Defaults** action button.

Left click on a specific hour to highlight that hour.

Right-click on that highlighted hour to display the drop-down menu.

Left click on **Paste To Hour(s)** action button.

On the default data entry line, enter values into the following fields:

- Price

Updates to the price can be made for one hour or multiple hours at once. If an hour is not populated, it will default to use the daily offer curve for that hour. Once an update is saved, it cannot be removed.

Click the **Save** button.

“Success: Save successful” message is displayed.

The new segment with the chosen MW and Price will display for the selected hour.

To download selected information, click the **XML** or **CSV** report buttons.

The file is downloaded to your specified local directory or you can open it to view in a separate browser window.

8.13 Select Schedules to be Available

The Schedule Selection web page is used to mark schedules “available”. At least one cost-based schedule must be made available. For Price based capacity resources, one price-based PLS schedule must be made available. One price-based schedule can be made available.

The Schedule Selection web page presents all schedules for all units in a portfolio. The following information is presented:

Location – The full name of the generating unit.

Type – The schedule type. The S part of the CPTUS code. This is the Schedule Type field entered on the Schedule Manager web page.

Parameter Limited – Indicates whether the schedule is Parameter Limited or not.

Schedule Name – The full name of a unit schedule. This is the Description field entered on the Schedule Manager web page.

Availability – Indicates the availability status of the generating unit’s schedules. “Available” indicates that the schedule is available for PJM to choose for the Operating Day. “Not Available” indicates that the schedule is not available for PJM to choose for the Operating Day. “Not Available” is the default.

Daily No-Load Cost – Allows the user to modify the No Load Cost field from one web page.

Daily Cold Start Cost – Allows the user to modify the Cold Start Cost field from one web page.

Daily Int. Start Cost — Allows the user to modify the Intermediate Start Cost field from one web page.

Daily Hot Start Cost — Allows the user to modify the Hot Start Cost field from one web page.

Steps (from the left navigation bar):

Select **Generator**.

Select **Schedules**.

Select the **Selection** tab.

The Schedules Selection web page appears.

Click the Market Day calendar to select the date.

Select the desired portfolio from the Portfolio list.

The generating units for the selected portfolio appear in the Location list.

Select the generating unit from the Location list.

The data for the selected unit schedule appears on the Schedule Selection web page.

Locate and click in the Availability column of the row with the Schedule to be selected.

Click in the check box to modify the Availability of the Schedule.

Click the **Save** button.

“Success: Save successful” message is displayed.

The row will display with the modified Availability.

To download selected information, click the **XML** or **CSV** report buttons.

The file is downloaded to your specified local directory, or you can open it to view in a separate browser window.

8.14 Select Schedules to be Available in Real Time

The Schedule Availability Update web page is used to designate schedule availability in Real Time. Availability may only be changed for cost schedules and only for those schedules that were present in the Day-Ahead. There may only be one cost schedule per fuel type made Available during any given hour (the fuel types are Co-Fire, Coal, Gas, Hydro, Nuclear, Other and Petroleum). Fuel information is required to use this option. The following information may be provided:

Schedule Name – The full name of a unit schedule. This is the Schedule Name field entered on the Schedule Manager web page.

Schedule Description – The unit’s description as written in the Schedule Description field on the Schedule Manager web page.

Schedule Type – Indicates the type, whether Price, Cost or Price-PLS, for the schedule.

Fuel Type – The type of fuel associated with the schedule, as defined on the Schedule Detail web page.

Availability – Schedules on which the unit is committed cannot change availability. At least one cost-based schedule must be made available for all hours. Only one cost-based schedule can be made available per fuel type.

Status – Indicates if the unit has been committed on that schedule in Day-Ahead or Real Time, or if the unit has not been committed on that schedule.

Steps (from the left navigation bar):

Select **Generator**.

Select **Schedules**.

Select the **Availability Update** tab.

The Schedules Availability Update web page appears.

Click the Market Day calendar to select the date.

Select the desired portfolio from the Portfolio list.

The generating units for the selected portfolio appear in the Location list.

Select the generating unit from the Location list.

Select the schedule from the Schedule list (if different than the default ALL).

Select the fuel from the Fuel list (if different than the default ALL).

Select the hour from the Hour list (if different than the default ALL).

Select the availability from the Available list (if different than the default ALL).

The data for the selected unit schedule appears on the Schedule Availability Update web page.

Modify Availability for each hour such that only one cost schedule per fuel type is Available.

Note: Setting will carry forward through hour 24 unless changed in a later hour.

Click the **Save** button.

“Success: Save successful” message is displayed.

The row will display with the modified Availability.

To download selected information, click **XML** or **CSV** report buttons.

The file is downloaded to your specified local directory, or you can open it to view in a separate browser window.

8.15 TPS Test Schedule Switching in Real Time

An hourly TPS test is conducted every hour to mitigate market power for all online, offline, and self-scheduled units. If a supplier fails the test, depending on the situation, all units associated with the supplier maybe offer capped at the cheaper of the price-based or cost-based offer or pls. This screen provides insight into when and why the schedule that the unit was originally committed on has switched schedule due to the results for the TPS test.

The Schedule TPS Schedule Switch web page presents the schedules that have switched based on the results of the TPS test. This web page is read-only. The following information is presented:

Location – The full name of the generating unit.

Original Schedule Name – The full name of the schedule the unit was originally committed on as written under the Schedule Manager web page.

Original Schedule Type – The type of schedule (whether Price, Cost or Price-PLS) as defined under the Schedule Manager web page.

New Schedule Name – The full name of the schedule the unit was switched to, based on the results of the TPS test.

New Schedule Type – The type of schedule the unit was switched to, based on the results of the TPS test.

Constraint Name – The constraint used in the test to determine the market power of the unit.

Contingency – The contingency associated with the constraint used in the TPS test.

Steps (from the left navigation bar):

Select **Generator**.

Select **Schedules**.

Select the **TPS Schedule Switch** tab.

The Schedules TPS Schedule Switch web page appears.

Click the Market Day calendar to select the date.

Select the desired portfolio from the Portfolio list.

The generating units for the selected portfolio appear in the Location list.

Review the following schedule switch information:

- Location
- Original Schedule Name
- Original Schedule Type
- New Schedule Name
- New Schedule Type
- Constraint Name
- Contingency

To download selected information, click the **XML** or **CSV** report buttons.

The file is downloaded to your specified local directory, or you can open it to view in a separate browser window.

8.16 Offer Verification for Cost-based Offers Greater than \$1,000/MWh

In accordance with FERC Order 831, effective April 12, 2018, incremental energy offer segments greater than \$1,000/MWh must be verified in order to be eligible to set LMP. Per FERC's requirements:

- A resource's incremental energy offer must be capped at \$1,000/MWh or the resource's cost-based incremental energy offer, whichever is higher. Cost-based incremental energy offers must be capped at \$2,000/MWh for the purpose of calculating LMP.
- The costs underlying a cost-based incremental energy offer above \$1,000/MWh must be verified before it can be used to calculate LMP. If a resource submits an incremental energy offer above \$1,000/MWh and the underlying costs cannot be verified before the market clearing process begins, the offer may not be used to calculate LMP. In this case, the resource would be eligible for a make-whole payment if it is dispatched and its costs are verified after the fact. A resource would also be eligible for a make-whole payment if it is dispatched and its verified cost-based incremental energy offer exceeds \$2,000/MWh.
- All resources, regardless of type, are eligible to submit cost-based incremental energy offers in excess of \$1,000/MWh.

Steps (from the left navigation bar) for submitting hourly differentiated offers:

Select **Generator**.

Select **Schedules**.

Select the **Offer Updates** tab.

The Offer Updates web page appears.

Click the Market Day calendar to select the date.

Select the desired portfolio from the Portfolio list.

The generating units for the selected portfolio appear in the Location list.

Select the generating unit from the Location list.

Select the cost-based schedule from the Schedule list.

The data for the selected unit schedule appears on the Offer Updates web page.

Left click on a specific hour to highlight that hour.

Right-click on that highlighted hour to display the drop-down menu.

Left click on **Add Segment** action button.

On the new hourly offer updates data entry line, enter values into the following fields:

- MW
- Price

To remove a segment, right-click on selected segment, then left-click on **Delete Segment** action button.

Hourly offer curves can be added for one-hour, multiple hours, or all hours. If an hour is not populated, it will default to use the daily offer curve for that hour.

Click the **Save** button.

“Success: Save successful” message is displayed.

The new segment with the chosen MW and Price will display for the selected hour.

To download selected information, click the **XML** or **CSV** report buttons.

The file is downloaded to your specified local directory, or you can open it to view in a separate browser window.

Steps (from the left navigation bar) for submitting hourly offer updates:

Select **Generator**.

Select **Schedules**.

Select the **Offer Updates** tab.

The Offer Updates web page appears.

Click the Market Day calendar to select the date.

Select the desired portfolio from the Portfolio list.

The generating units for the selected portfolio appear in the Location list.

Select the generating unit from the Location list.

Select the cost-based schedule from the Schedule list.

The data for the selected unit schedule appears on the Offer Updates web page.

Right-click on any hour to display the drop-down menu.

Left click on **Copy Defaults** action button.

Left click on a specific hour to highlight that hour.

Right-click on that highlighted hour to display the drop-down menu.

Left click on **Paste To Hour(s)** action button.

On the default data entry line, enter values into the following fields:

- Price

Updates to the price can be made for one hour or multiple hours at once. If an hour is not populated, it will default to use the daily offer curve for that hour. Once an update is saved, it cannot be removed.

Click the **Save** button.

“Success: Save successful” message is displayed.

The new segment with the chosen MW and Price will display for the selected hour.

To download selected information, click the **XML** or **CSV** report buttons.

The file is downloaded to your specified local directory, or you can open it to view in a separate browser window.

8.17 Offer Verification for Price-based Offers Greater than \$1,000/MWh

Price-based offers may not exceed \$1,000/MWh unless a cost-based offer is verified above \$1,000/MWh, at which time the price-based offer is capped at the lesser of the cost-based incremental energy offer or \$2,000/MWh. In order to specify a price-based offer above \$1,000/MWh, the following criteria must be satisfied in Markets Gateway for each hour in which offers greater than \$1,000/MWh are submitted:

- A reference cost-based schedule to compare the market-based schedule must be specified in the “Reference Schedule” column of the Schedule > Detail Updates screen. Schedule IDs for all cost-based schedules for a particular unit are listed in the drop down. Choose the Schedule ID of the cost-schedule that should be referenced when comparing the offers. The reference schedule should be the same Fuel Type as the price schedule.
- The price-based schedule and the reference cost-based schedule must have the same offer slope selection and identical MW break points on their incremental energy offers. Note: all MW blocks must match the entire offer curve, not just those segments offered above \$1,000/MWh. Offer Slope selection and MW breakpoints cannot be updated intraday.
- The startup and no-load fees on the price-based offer must be less than or equal to those on the reference cost-based offer. This includes hot, inter, and cold startup costs on an hourly level (or daily if hourly is not specified). Note: Units that elect to use Price-based Startup and No-load cannot update values for the current period. In cases where the current period’s price-based values exceed the reference cost-based schedule’s cost-based startup and no-load, the price-based schedule will not meet the requirement for item 3 above and instead may elect to utilize the “Switch to Cost” functionality or be capped at \$1,000/MWh.
- The incremental energy offer price for each segment on the price-based schedule above \$1,000 must be less than or equal to the incremental energy offer price of the corresponding segment on the reference cost-based offer. Price-based offer segments less than \$1,000/MWh do not need to be less than or equal to the corresponding segment on the reference cost-based offer.

Steps (from the left navigation bar) for submitting a Reference Cost-based Schedule:

Select **Generator**.

Select **Schedules**.

Select the **Detail Updates** tab.

The Detail Updates web page appears.

Click the Market Day calendar to select the date.

Select the desired portfolio from the Portfolio list.

The generating units for the selected portfolio appear in the Location list.

Select the generating unit from the Location list.

Select the schedule from the Schedule list.

The data for the selected unit schedule appears on the Detail Updates web page.

Left click on a specific hour to highlight that hour.

Right-click on that highlighted hour to display the drop-down menu.

Left click on **Copy Defaults** or **Copy Hour** action button.

Left click on selected hour and select **Paste To Hour(s)** action button.

On the selected detail updates data entry line, enter values into the following fields:

- Minimum Runtime
- Notification Time
- Reference Schedule

Note: A cost-based Reference Schedule must be selected for each individual hour that has a submitted offer update in order to allow a price-based offer greater than \$1,000/MWh in the Schedules Offer Updates tab.

Click the **Save** button.

"Success: Save successful" message is displayed.

The new price schedule detail update with the chosen Reference Schedule will display for the selected hour.

To download selected information, click the **XML** or **CSV** report buttons.

The file is downloaded to your specified local directory, or you can open it to view in a separate browser window.

Steps (from the left navigation bar) for submitting hourly differentiated offers:

Select **Generator**.

Select **Schedules**.

Select the **Offer Updates** tab.

The Offer Updates web page appears.

Click the Market Day calendar to select the date.

Select the desired portfolio from the Portfolio list.

The generating units for the selected portfolio appear in the Location list.

Select the generating unit from the Location list.

Select the price-based schedule from the Schedule list.

The data for the selected unit schedule appears on the Offer Updates web page.

Left click on a specific hour to highlight that hour.

Right-click on that highlighted hour to display the drop-down menu.

Left click on **Add Segment** action button.

On the new hourly offer updates data entry line, enter values into the following fields:

- MW
- Price

To remove a segment, right-click on selected segment, then left-click on **Delete Segment** action button.

Hourly offer curves can be added for one hour, multiple hours, or all hours. If an hour is not populated, it will default to use the daily offer curve for that hour.

Click the **Save** button.

"Success: Save successful" message is displayed.

The new segment with the chosen MW and Price will display for the selected hour.

To download selected information, click the **XML** or **CSV** report buttons.

The file is downloaded to your specified local directory, or you can open it to view in a separate browser window.

Steps (from the left navigation bar) for submitting hourly offer updates:

Select **Generator**.

Select **Schedules**.

Select the **Offer Updates** tab.

The Offer Updates web page appears.

Click the Market Day calendar to select the date.

Select the desired portfolio from the Portfolio list.

The generating units for the selected portfolio appear in the Location list.

Select the generating unit from the Location list.

Select the price-based schedule from the Schedule list.

The data for the selected unit schedule appears on the Offer Updates web page.

Right-click on any hour to display the drop-down menu.

Left click on **Copy Defaults** action button.

Left click on a specific hour to highlight that hour.

Right-click on that highlighted hour to display the drop-down menu.

Left click on **Paste To Hour(s)** action button.

On the default data entry line, enter values into the following fields:

- Price

Updates to the price can be made for one hour or multiple hours at once. If an hour is not populated, it will default to use the daily offer curve for that hour. Once an update is saved, it cannot be removed.

Click the **Save** button.

“Success: Save successful” message is displayed.

The new segment with the chosen MW and Price will display for the selected hour.

To download selected information, click the **XML** or **CSV** report buttons.

The file is downloaded to your specified local directory, or you can open it to view in a separate browser window.

8.18 Offer Verification Exception Request

For segments that did not pass the initial automated screen, Market Sellers may submit an exception request in Markets Gateway. Hourly offers that exceed \$1,000/MWh but do not have a corresponding exception request will show a “No” in the *Exception Exists* column in the Schedules Offer Updates web page. Hourly offers that exceed \$1,000/MWh and have a corresponding exception request will show a “Yes” in the *Exception Exists* column in the Schedules Offer Updates web page. The *Capped Price* column is updated to reflect the verified offer price as a result of the Exception Process. If an offer fails the Exception Request, the *Capped Price* value resulting from the automated offer screen will be used to cap the submitted offer, for pricing and dispatch purposes, at the highest verified segment, or \$1,000/MWh.

If an offer was approved or partially failed, as indicated by the *Capped Price* column value for the respective offer hour(s), Market Sellers do not need to resubmit their original offer. Any segments that were submitted equal to or less than the updated Capped Price will be used for pricing for any future operating hours. **The Market Seller should not go back and update the Offer in Markets Gateway, as any updates will override the Capped Price value derived via the Exception Process for the respective offer hour(s).**

When updating the Fuel Price Exceptions web page for Offer Verification, all three steps are required for a successful submission and for the Schedules Offer Updates web page to show a “Yes” in the *Exception Exists* column. Step 1 is used to create the fuel price exception with the appropriate unit, start/end hours, fuel price source, hub name, price quantity and Fuel Cost Policy number. Step 2 is used to upload supporting documentation such as the Fuel Cost Policy and a price quote. Step 3 is used to assign the uploaded file(s) to the appropriate unit and schedule.

Steps (from the left navigation bar):

Select **Generator**.

Select **Schedules**.

Select the **Fuel Price Exceptions** tab.

The Schedules Fuel Price Exceptions web page appears.

Click the Market Day calendar to select the date.

Select the desired portfolio from the Portfolio list.

The generating units for the selected portfolio appear in the Location list.

Select the generating unit from the Location list.

The existing schedule types for the selected generating unit display on the Manager web page.

Select the Schedule to be modified from the Schedule list.

The selected schedule would be available for modifications in the area below.

For STEP 1 (Create Fuel Price Exception), in the whitespace of the area below the header columns, right-click and select “Add Item”. Input data into the following editable fields:

- Start Hour (*cannot be null*)
- End Hour (*cannot be null*)
- Source of Fuel Price (*cannot be null*)
- Fuel Hub Name (*cannot be null*)
- Fuel Price (*cannot be null*)
- Fuel Cost Policy Number

For STEP 2 (Upload Supporting Documentation), click on “Upload” button and click on “Choose File” to select file to upload as part of supporting documentation. Input data into the following editable fields:

- Description (*cannot be null*)
- Start Day (*cannot be null*)
- End Day (*cannot be null*)

Click on **Upload** button.

Note that all fields are required including the file name, description, and start/end dates. Files can be applicable for and span multiple days. A user cannot submit duplicate file names for a unit, as each separate file name must be unique. All files uploaded are subject to virus scanning, and individual file uploads cannot exceed 500 MB in size. Zip files are not accepted due to security concerns.

For STEP 3 (Assign File to Location / Schedule), in the whitespace of the area below the header columns, right-click and select “Add Item”. Input data into the following editable fields:

- File Name (*cannot be null*)
- Location and Schedule (*cannot be null*)

Click the **Save** button.

“Success: Save successful” message is displayed.

The location with the selected schedule will display.

To remove an Exception Request, select a submitted row in Steps 1 & 3, right-click and select “Remove Item”. For Step 2, select a submitted row and click **Delete** button.

Click the **Save** button.

“Success: Save successful” message is displayed.

To download selected information, click the **XML** or **CSV** report buttons.

The file is downloaded to your specified local directory, or you can open it to view in a separate browser window.

8.19 Composite Offer Verification

The Composite Offer Verification web page provides information on generation resources if their Composite Energy Offer is calculated to be above \$1,000/MWh for Fast-Start resources. This web page is read-only. All inputs are used to calculate the Composite Energy Offer, which is calculated at the resource's Economic Maximum value. This display shows the results of the automated validation of Startup costs and No-Load costs for Fast-Start Capable generator resources. Fast-Start Resources are generation or Economic Load Response Resources that are capable of operating with a notification time plus startup time of one hour or less and a Minimum Run Time or Minimum Down Time of one hour or less.

More information regarding the market rules for Composite Energy Offer Verification for Fast-Start Capable Resources can be found in Manual 11, Section 2. The following information is presented on the Composite Offer Verification web page in Markets Gateway:

Hour – The market hour (Hour Ending).

Location – The full name of the generating unit.

Schedule – The type of schedule on which the unit offer was submitted.

Calculated Composite Offer – The calculated offer consisting of Startup costs, No Load costs, and Incremental Offers

No Load Incremental Valid – Indicates whether the No Load component of the Composite Offer passes validation.

Cold Startup Cost Valid – Indicates whether the Cold Startup Cost component of the Composite Offer passes validation.

No Load Cost – The hourly fixed cost, expressed in \$/hr., to run the generating unit at zero net output.

Cold Startup Cost – The dollars per start when the generating unit is in a cold temperature state.

Incremental Offer At Economic Maximum – The incremental energy offer component of the composite energy offer, in \$/MWh, at the economic maximum output of the unit.

Economic Maximum – The maximum energy available, in MW, from the unit for economic dispatch.

Minimum Runtime – The minimum number of hours a unit must run, in real-time operations, from the time the unit is put online to the time the unit is shut down (as measured by PJM's State Estimator).

Hot Startup Time – The dollars per start when the generating unit is in a hot temperature state.

Notification Time – The time interval, in hours, between PJM notification and the start sequence of a generating unit.

Use Slope – Indicates whether or not the submitted offer has selected to use the offer slope function.

Steps (from the left navigation bar):

Select **Generator**.

Select **Schedules**.

Select the **Composite Offer Verification** tab.

The Composite Offer Verification web page appears.

Click the Market Day calendar to select the date.

Select the desired portfolio from the Portfolio list.

The generating units for the selected portfolio appear in the Location list.

Select the generating unit from the Location list.

The following information can be viewed on this web page (each column can be filtered if desired):

- Location
- Schedule
- Calculated Composite Offer
- No Load Incremental Valid
- Cold Startup Cost Valid
- No Load Cost
- Cold Startup Cost
- Incremental Offer at Economic Maximum
- Economic Maximum
- Minimum Runtime
- Hot Startup Time
- Notification Time
- Use Slope

To download selected information, click the XML or CSV report buttons.

The file is downloaded to your specified local directory, or you can open it to view in a separate browser window.

9.0 Parameter Limited Schedules

9.1 Parameter Limited Schedules Overview

Generation suppliers must submit schedules that meet certain pre-determined limits (parameter limited schedules) which are based on the physical parameters of the units and are applied when certain system conditions exist. These conditions could exist when (i) the unit owner fails the three pivotal supplier test and (ii) PJM declares a Maximum Generation Emergency, issues an alert that a Maximum Generation Emergency may be declared ("Maximum Generation Emergency Alert"), or schedules units based on the anticipation of a Maximum Generation Emergency or Maximum Generation Emergency Alert for part or all of an Operating Day.

Parameter limits are determined on a unit-class basis and are assigned to each unit for the following schedule parameters:

- Minimum Runtime
- Maximum Runtime
- Minimum Downtime
- Maximum Daily Starts
- Maximum Weekly Starts
- Turn Down Ratio
- Startup Times (Cold, Intermediate, Hot)
- Notification Times (Cold, Intermediate, Hot)

9.2 Which Web Pages Do I Use?

The following web pages are used to view and manage generating unit schedules:

- **Participant** – use this web page to view parameter limits for all units in a participant portfolio.
- **Exception** – use this web page to submit a parameter limit temporary exception or Real Time Values requests.

9.3 View Parameter Limited Values

The Participant web page presents all parameter limits for all units in a portfolio.

The following information is presented:

Location – The full name of the generating unit.

Description – Description of the applicable parameter limits.

Min Runtime (hour) – The submitted Minimum Run Time may not exceed the defined Minimum Run Time for the unit, unless an exception is granted.

Max Runtime (hour) – The submitted Maximum Runtime may not be less than the defined Maximum Runtime for the unit, unless an exception is granted.

Min Downtime (hour) – The submitted Minimum Down Time may not exceed the defined Minimum Down Time for the unit, unless an exception is granted.

Max Daily Starts – The submitted Maximum Daily Starts may not be less than the defined Maximum Daily Starts Time for the unit, unless an exception is granted.

Max Weekly Starts – The submitted Maximum Weekly Starts may not be less than the defined Maximum Weekly Starts for the unit, unless an exception is granted.

Turn Down Ratio – Turn Down Ratio is defined as the ratio of economic maximum MW to economic minimum MW. The submitted Turn Down Ratio may not be less than the defined Turn Down Ratio for the unit, unless an exception is granted.

Cold Startup Time (hour) – The submitted Cold Startup Time may not exceed the defined Cold Startup Time for the unit, unless an exception is granted.

Intermediate Startup Time (hour) – The submitted Intermediate Startup Time may not exceed the defined Intermediate Startup Time for the unit, unless an exception is granted.

Hot Startup Time (hour) – The submitted Hot Startup Time may not exceed the defined Hot Startup Time for the unit, unless an exception is granted.

Cold Notify Time (hour) – The submitted Cold Notification Time may not exceed the defined Cold Notification Time for the unit, unless an exception is granted.

Intermediate Notify Time (hour) – The submitted Intermediate Notification Time may not exceed the defined Intermediate Notification Time for the unit, unless an exception is granted.

Hot Notify Time (hour) – The submitted Hot Notification Time may not exceed the defined Hot Notification Time for the unit, unless an exception is granted.

9.4 View Participant Parameter Limits

Steps (from the left navigation bar):

Select **Parameter Limits**.

Select the **Participant** tab.

The Parameter Limits Participant web page appears.

Click the Market Day calendar to select the date.

Select the desired portfolio from the Portfolio list.

The generating units for the selected portfolio appear in the Location list.

Select the generating unit from the Location list.

The data for the selected location appears on the Parameter Limit web page.

Review the following information:

- Location
- Description
- Min Runtime
- Max Runtime
- Min Downtime
- Max Daily Starts

- Max Weekly Starts
- Turn Down Ratio
- Cold Startup Time
- Intermediate Startup Time
- Hot Startup Time
- Cold Notify Time
- Intermediate Notify Time
- Hot Notify Time

To download selected information, click the **XML** or **CSV** report buttons.

The file is downloaded to your specified local directory, or you can open it to view in a separate browser window.

9.5 Submit Exception Parameter Limits

The Exception Parameter Limits web page is used to submit a parameter limit temporary exception request. On a daily basis, each generation supplier may submit notification to PJM that changed physical operational limitations at the unit require a temporary exception to the unit's parameters. Each generation supplier must supply the required unit operating data in support of the exception.

- The process and timeline for submitting a temporary exception is as follows:
- Initial Deadline to request a parameter exception that will begin the next operating day or in Real-time.
- PLS Schedules (both Price & Cost) will be revised in Markets Gateway to change the parameter limit for the next operating day or in Real-time.
- Temporary Exception Requests should be submitted via Markets Gateway
- Supporting documentation for Temporary Exception Requests should also be submitted via Markets Gateway in the Exceptions web page under the *Upload Supporting Document* section.
- PJM must receive a complete exception request that includes:
 - Unit Name
 - Parameter Limit Requested
 - Reason for Exception Request
 - eDart ticket if applicable
 - Justification for Exception Request, including required unit operating data in support of the exception.
 - Date on which the exception period will end. Exceptions granted may not continue past the beginning of the next period.
- Prior to withdrawing an Exception Request, Market Sellers will need to restore cost and price PLS schedules to be in compliance with proxy or approved unit specific parameter limits.
 - Supporting documentation must also be submitted when an Exception Request is withdrawn.

The Exception Parameter Limits web page presents all parameter limited exception requests for all units in a portfolio. The following information is presented:

Location – The full name of the generating unit.

Minimum Runtime (hour) – The submitted Minimum Run Time may not exceed the defined Minimum Run Time for the PJM-defined unit class, unless an exception is granted.

Maximum Runtime (hour) – The submitted Maximum Runtime may not be less than the defined Maximum Runtime for the unit, unless an exception is granted.

Minimum Downtime (hour) – The submitted Minimum Down Time may not exceed the defined Minimum Down Time for the PJM-defined unit class, unless an exception is granted.

Maximum Daily Starts – The submitted Maximum Daily Starts may not exceed the defined Maximum Daily Starts Time for the PJM-defined unit class, unless an exception is granted.

Maximum Weekly Starts – The submitted Maximum Weekly Starts may not exceed the defined Maximum Weekly Starts for the PJM-defined unit class, unless an exception is granted.

Turn Down Ratio – Turn Down Ratio is defined as the ratio of economic maximum MW to economic minimum MW. The submitted Turn Down Ratio may not be less than the defined Turn Down Ratio for the unit, unless an exception is granted.

Request Type – The request type must be 'Temp Except'. *Note – After August 1, 2024, the 'Daily' or 'Real Time Temp Except' request types will still show up for a period time as legacy options, but participants will not be able to submit exceptions using these two options going forward.*

Start Date – The start date of the exception request.

End Date – The end date of the exception request.

Justification – Submitted by generation to justify a temporary exception to the unit's parameters. This field cannot be empty.

Status – A status of an exception request may be Pending, Approved, Denied or Withdrawn.

eDart Ticket Number – eDart Ticket Number for unit outage.

Cold Startup Time (hour) – The submitted Cold Startup Time may not exceed the defined Cold Startup Time for the unit, unless an exception is granted.

Intermediate Startup Time (hour) – The submitted Intermediate Startup Time may not exceed the defined Intermediate Startup Time for the unit, unless an exception is granted.

Hot Startup Time (hour) – The submitted Hot Startup Time may not exceed the defined Hot Startup Time for the unit, unless an exception is granted.

Cold Notify Time (hour) – The submitted Cold Notification Time may not exceed the defined Cold Notification Time for the unit, unless an exception is granted.

Intermediate Notify Time (hour) – The submitted Intermediate Notification Time may not exceed the defined Intermediate Notification Time for the unit, unless an exception is granted.

Hot Notify Time (hour) – The submitted Hot Notification Time may not exceed the defined Hot Notification Time for the unit, unless an exception is granted.

The *Upload Supporting Document* section allows for supporting documentation file uploads.

Request ID – The identification number associated with the corresponding submitted exception request.

File Name – The name of the uploaded file used as supporting documentation.

File Description – A description of the uploaded file used as supporting documentation.

Steps (from the left navigation bar):

Select **Parameter Limits**.

Select the **Exception** tab.

The Parameter Limits Exception web page appears.

Click the Market Day calendar to select the date.

Click the Start Day calendar to select the date.

Click the End Day calendar to select the date.

Select the desired portfolio from the Portfolio list.

The generating units for the selected portfolio appear in the Location list.

Select the generating unit from the Location list.

Select the desired status from the Status list.

Select the desired request type from the Request Type list.

The data for the selections appears on the Parameter Limits Exception web page.

Right click to display the Add Item action button.

Left click to open a new exception data entry line.

On the new exception data entry line, enter data into the following fields:

- Min Runtime
- Max Runtime
- Min Downtime
- Max Daily Starts
- Max Weekly Starts
- Turn Down Ratio
- Request Type
- Start Date
- End Date
- Justification
- Status
- eDart Ticket Number

- Cold Startup Time
- Intermediate Startup Time
- Hot Startup Time
- Cold Notify Time
- Intermediate Notify Time
- Hot Notify Time

Under the Upload Supporting Document section, Left click the Upload button.

In the pop-up window, enter data into the following fields:

- Request ID
- Description

Select the Choose File button and select the appropriate file to be used for the supporting documentation upload.

Note: Uploaded files will be subject to a virus scan, and .ZIP file types will not be accepted due to security concerns.

Click the **Save** button.

“Success: Save successful” message is displayed.

The new row with a Request ID will appear with a Status of Pending when successfully submitted, along with any supporting documentation that was submitted, if applicable.

To download selected information, click the **XML** or **CSV** report buttons.

The file is downloaded to your specified local directory, or you can open it to view in a separate browser window.

9.6 View Parameter Limited Schedule Exception Requests

Steps (from the left navigation bar):

Select **Parameter Limits**.

Select the **Exception** tab.

The Parameter Limits Participant web page appears.

Click the Market Day calendar to select the date.

Click the Start Day calendar to select the date.

Click the End Day calendar to select the date.

Select the desired portfolio from the Portfolio list.

The generating units for the selected portfolio appear in the Location list.

Select the generating unit from the Location list.

Select the desired status from the Status list.

Select the desired request type from the Request Type list.

The data for the selections appears on the Parameter Limits Exception web page.

View data that is entered in the following fields:

- Request ID
- Location
- Min. MW
- Max. MW
- Min. Runtime Limit
- Max. Runtime Limit
- Min. Downtime Limit
- Max. Daily Starts Limit
- Max. Weekly Starts Limit
- Turn Down Ratio Limit
- Request Type
- Start Date
- End Date
- Justification
- Status
- eDart Ticket Number
- Cold Startup Time
- Inter Startup Time
- Hot Startup Time
- Cold Notify Time
- Inter Notify Time
- Hot Notify Time

To download selected information, click the **XML** or **CSV** report buttons.

The file is downloaded to your specified local directory, or you can open it to view in a separate browser window.

10.0 Managing Unit Regulation Data

10.1 Regulation Data Overview

A regulation offer consists of the following data: regulation offer MWs, regulation capability price and cost, regulation mileage price and cost, regulation maximum and minimum limit (optional) and regulation availability status.

Managing regulation offers is accomplished by performing the following general Steps (from the left navigation bar):

- Entering regulation limits
- Submitting regulation offers, including selecting the status of the regulating unit.

The Markets Gateway System is also used to collect the information that is needed for bilateral transactions.

10.2 Which Web Pages Do I Use?

The following web pages are used to view and manage generating unit schedules:

- **Unit > Detail** – Use this web page to enter default daily regulating high and low limits.
- **Regulation Market > Offers** – Use this web page to create a daily regulation offer and modify the status of the daily regulation offer.
- **Regulation Market > Updates** – Use this web page to modify regulation resources' offers and parameters on an interval basis.
- **Regulation Market > Availability Updates** – Use this web page to declare resource availability (Available, Not Available, Self Scheduled) per half hour interval.
- **Regulation Bilaterals** – use this web page to facilitate a regulation bilateral transaction.

10.3 Enter Regulation Limits

Regulation limits are defined on a unit basis. The following daily regulating limits are entered into the Regulation and Miscellaneous sections of the Unit Detail page.

Regulation Max MW – Maximum generation limit when unit is providing regulation. Optional, value defaults to the economic maximum limit if left blank. Note: Hourly updates are made on the Regulation Market > Updates screen, not the Unit Hourly Updates Screen.

Regulation Min MW – Minimum generation limit when unit is providing regulation. Optional, value defaults to the economic minimum limit if left blank. Note: Hourly updates are made on the Regulation Market > Updates screen, not the Unit Hourly Updates Screen.

Reduced Ramp Rate (%) – Minimum percentage of the bid-in ramp rate used for the reduced energy ramp rate logic when a unit is providing both energy and regulation. Values must be whole numbers, and negative values are not allowed. If you enter zero (the default value) then 100% of the assigned Regulation MW (divided by 5) will reduce the bid-in energy ramp rate for SCED. Note: Hourly updates are made on the Regulation Market > Updates screen, not the Unit Hourly Updates Screen.

Maximum and minimum regulation limits fields appear only for generating units that have non-zero Regulating Capability (i.e. a certified regulation resource), as defined in the primary unit characteristics. The maximum and minimum regulation limits also appear on the Regulation Offers web page but are read-only.

Steps (from the left navigation bar):

Select **Generator**.

Select **Unit**.

Select the **Detail** tab.

The Unit Detail web page appears.

Click the Market Day calendar to select the date.

Select the desired portfolio from the Portfolio list.

The generating units for the selected portfolio appear in the Location list.

Select the generating unit from the Location list.

The detail for the selected generating unit appears.

Scroll vertically to the **Miscellaneous** and **Regulation** sections of the page.

Select and enter data for the following regulation limits:

- Regulation Max MW
- Regulation Min MW
- Reduced Ramp Rate Percent

Click the **Save** button.

“Success: Save successful” message is displayed.

To download selected information, click the **XML** or **CSV** report buttons.

The file is downloaded to your specified local directory, or you can open it to view in a separate browser window.

10.4 Submit Daily Regulation Offer

Daily Regulating offers must be submitted for all units that are providing regulation, including units that are self-scheduling regulation or providing regulation to support a bilateral transaction. Daily regulation offers are made by product with one row representing a set of offers for a resource for each product. Please see Manual 15, Section 2.8 for guidelines on Regulation cost offers. A regulation offer consists of the following pieces of data:

Area – A bulk electric system or combination of bulk electric systems bounded by interconnection metering and telemetry to which a common generation control scheme and reserve requirement is applied.

Offer MW – The amount of regulation MW offered for the unit. This field is required if the unit is either Available or Self-Scheduled to provide regulation. The value should not be greater than the MWs the resource is qualified for.

Capability Offer Price – The capability price at which regulation is offered for the unit. If a unit is available for regulation and no price is entered, the price will default to 0.0. Capability and Performance Price Offers must total to less than or equal to \$100/MWh. Offers may not be negative.

Mileage Offer Price – The mileage price at which regulation is offered for the unit. If a unit is available for regulation and no price is entered, the price will default to 0.0. Capability and Performance Price Offers must total to less than or equal to \$100/MWh. Offers may not be negative.

Capability Offer Cost – The capability cost at which regulation is offered for the unit. Cost offers are required (cannot be null) as part of the regulation offer and must be greater than or equal to 0.

Mileage Offer Cost – The mileage cost at which regulation is offered for the unit. Cost offers are required as part of the regulation offer and must be greater than or equal to 0.

Heat Rate @ Eco Max [BTU/kWh] – The heat rate at the default economic maximum for a resource. The economic maximum that will correspond to this rate value will be the default economic maximum that is shown on both the Daily Regulation Offers and Unit Details pages. This is an optional parameter that may be submitted in the Markets Gateway System to support the cost-based regulation offer price. If not submitted it defaults to zero. Not a valid field for a Demand Response resource or energy storage resource.

Heat Rate @ Reg Min [BTU/kWh] – The heat rate at the default regulation minimum for a resource. The regulation minimum that will correspond to this rate value will be the default regulation minimum that is shown on both the Daily Regulation Offers and Unit Details pages. This is an optional parameter that may be submitted in the Markets Gateway System to support the cost-based regulation offer price. If not submitted it defaults to zero. Not a valid field for a Demand Response resource or energy storage resource.

VOM Rate [\$ /MWh of Regulation] – The increase in VOM (variable operating & maintenance expense) resulting from operating the regulating resource at a higher heat rate than is otherwise economic for the purpose of providing regulation. This is an optional parameter that is available to be submitted in the Markets Gateway System to support the cost-based regulation offer price for non-energy resources only. If not submitted it defaults to zero. Not a valid field for a Demand Response resource.

Fuel Cost [\$ /MBTU] – The fixed fuel costs of the resource. This value will be used to determine the heat rate adjustments during steady-state and non-steady-state operation for the purpose of providing regulation. This is an optional parameter that may be submitted in the Markets Gateway System to support the cost-based regulation offer price. If not submitted it defaults to zero. Not a valid field for a Demand Response or energy storage resource.

Energy Storage Loss [\$ /MWh of Regulation] – The value is used to account for the energy losses experienced by an energy storage device while providing regulation service. This field is valid only for energy storage resources.

Eco Max MW – Maximum generation limit when unit is providing regulation. This value is entered on the Unit Detail page and can only be edited there.

Reg Min MW – Minimum generation limit when unit is providing regulation. This value is entered on the Unit Detail page and can only be edited there.

Min Offer MW – Minimum MW for assignment. When a non-null value is entered, the resource owner is declaring they must clear at least that amount or not at all. The “Min Offer MW” must be less than or equal to the submitted Offer MW.

Availability – Indicates availability of unit for the day.

Self-Scheduled – Indicates if the resource is self-scheduled for the day.

A regulation resource’s status is one of the following states:

- **Self-Scheduled** – Indicates if the unit is self-scheduled for regulation.
- **Available** – Indicates if the unit is available to provide regulation.
- **Not Available** – Indicates if the unit is unavailable to provide regulation.

Rolling Average Performance Score – The average performance score for the last 200 operating intervals. It is used to adjust the capability and mileage offer. This field cannot be edited and is for awareness only.

The daily regulation limits for the unit are entered on the Unit Detail web page.

Steps (from the left navigation bar):

Select **Generator**.

Select **Regulation Market**.

Select the **Offers** tab.

The Regulation Market Offers web page appears.

Click the Market Day calendar to select the date.

Select the desired portfolio from the Portfolio list.

The generating units for the selected portfolio appear in the Location list.

Select the generating unit from the Location list.

The data for the selected generating unit appears in the Regulation Offer's web page.

Enter the following regulation offer data for the resource by signal type:

- Offer MW
- Capability Offer Price
- Mileage Offer Price
- Capability Offer Cost
- Mileage Offer Cost
- Heat Rate @ Eco Max (Not a valid field for a Demand Response resource or energy storage resource)
- Heat Rate @ Eco Min (Not a valid field for a Demand Response resource or energy storage resource)
- VOM Rate (Valid only for a non-energy resource)
- Fuel Cost (Not a valid field for a Demand Response resource or energy storage resource)
- Energy Storage Loss (Valid only for an energy storage resource)
- Min Offer MW

Select one of the following regulating statuses for each offer:

- Self-Scheduled
- Available
- Not Available

The following values cannot be edited on the screen or are for display only:

- Area
- Eco Max MW
- Reg Min MW
- Rolling Avg. Performance Score

Click the Save button.

"Success: Save successful" message is displayed.

To download selected information, click the **XML** or **CSV** report buttons.

The file is downloaded to your specified local directory, or you can open it to view in a separate browser window.

10.5 Adjust Regulation Resource Hourly Offers (Updates)

Regulation offers may be submitted and/or modified for specific hours of the operating day. For resources following the Regulation signal, this is accomplished by editing the Regulation Updates page in Markets Gateway. The rows on the Regulation Updates page that have been edited will serve as an over-write of the data on the Regulation Offers page. A daily offer must be submitted on the Regulation Offers page before hourly offers can be submitted on the Regulation Updates page. All hourly updates must be made at least 35 minutes prior to the start of the operating hour.

In Real-Time, if a unit chooses to opt out of hourly offer updates, the Regulation Capability Offer Price and Cost & Regulation Mileage Offer Price and Cost columns will be locked out at the close of the Re-Bid period and throughout the operating day. Regulation MW values are still able to be updated up to 35 minutes before the top of the operating hour.

The default status of the Regulation Updates page displays “null” values in all columns except Reduced Ramp Rate (%) which defaults to zero.

Note: If a row on Regulation Updates page is not edited from the default status, the data on the Regulation Offers page prevails.

Hour– Hour to be adjusted in Hour Ending.

Reg. MW – Hourly Offer MW.

Reg. Min. MW – Minimum generation limit when unit is providing regulation.

Reg. Max. MW – Maximum generation limit when unit is providing regulation.

Spilling – Indicates that the hydro plant associated with this unit is currently in the spilling condition.

Reduced Ramp Rate (%) – Minimum bid in ramp rate used for the reduced energy ramp rate logic when a unit is providing both energy and regulation. If you enter zero (the default value) then 100% of the assigned Regulation MW (divided by 5) will reduce the bid-in energy ramp rate for SCED.

Min. Offer MW – Minimum MW for assignment. When a non-null value is entered, the resource owner is declaring they must clear at least that amount or not at all. The “Min Offer MW” must be less than or equal to the submitted Offer MW.

Reg. Capability Offer Price - The capability price at which regulation is offered for the unit. If a unit is available for regulation and no price is entered here, the price will default to the daily offer. Capability and Mileage Price Offers, if entered, cannot be greater than \$100/MWh. Offers may not be negative.

Reg. Mileage Offer Price - The mileage price at which regulation is offered for the unit. If a unit is available for regulation and no price is entered here, the price will default to the daily offer. Capability and Mileage Price Offers, if entered, cannot be greater than \$100/MWh. Offers may not be negative.

Reg. Capability Offer Cost - The capability cost at which regulation is offered for the unit. If a unit is available for regulation and no capability offer cost is entered, the daily value is used. Capability and Mileage Cost Offers, if entered, cannot be greater than \$100/MWh. Offers may not be negative.

Reg. Mileage Offer Cost - The mileage cost at which regulation is offered for the unit. If a unit is available for regulation and no mileage offer cost is entered, the daily value is used. Capability and Mileage Cost Offers, if entered, cannot be greater than \$100/MWh. Offers may not be negative.

Steps (from the left navigation bar):

Select **Generator**.

Select **Regulation Market**.

Select the **Updates** tab.

The Regulation Market Updates web page appears.

Click the Market Day calendar to select the date.

Select the desired portfolio from the Portfolio list.

The generating units for the selected portfolio appear in the Location list.

Select the generating unit from the Location list.

The data for the selected generating unit appears in the Regulation Updates web page.

Enter the following regulation offer data for the resource by signal type:

- Reg. MW
- Reg. Min. MW
- Reg. Max. MW
- Spilling
- Reduced Ramp Rate (%)
- Min. Offer MW
- Reg. Capability Offer Price
- Reg. Mileage Offer Price
- Reg. Capability Offer Cost
- Reg. Mileage Offer Cost

Click the **Save** button.

“Success: Save successful” message is displayed.

To download selected information, click the **XML** or **CSV** report buttons.

The file is downloaded to your specified local directory, or you can open it to view in a separate browser window.

10.6 Update Regulation Interval Availability

Regulation availability may be updated for specific intervals of the operating day and act as overrides of the default daily data on the Regulation Offers tab. This task is accomplished by editing the Availability Updates tab on the Regulation Market page in Markets Gateway. This must be completed no later than 35 minutes prior to the operating interval.

The daily availability from the Offers tab is listed as a read-only value at the top of the Availability updates table for reference. The default status of the Regulation Availability Updates page displays “null” values in all editable columns. There is a row for each unique half hour interval per market day.

Note: If a row/interval on Regulation Availability Updates page is not edited from the default status, the data on the Regulation Offers page prevails.

If the User needs to revise the availability to reflect real-time changes, the following information on the Availability Updates web page is entered:

Reg Availability – Interval specific resource availability. Availability status’ that can be selected are:

- Available
- Not Available
- Self Scheduled (Business Rules described in Manual 11, Section 3.7.3)

Steps (from the left navigation bar):

Select **Generator**.

Select **Regulation Market**.

Select the **Availability Updates** tab.

The Availability Updates web page appears.

Click the Market Day calendar to select the date.

Select the desired portfolio from the Portfolio list.

The generating units for the selected portfolio appear in the Location list.

Select the generating unit from the Location list.

The data for the selected generating unit appears in the Regulation Updates web page.

Enter the following regulation offer data for the resource:

- Reg Availability

Select one of the following regulating statuses for each interval:

- Available
- Not Available
- Self-Scheduled

Click the **Save** button.

“Success: Save successful” message is displayed.

To download selected information, click the **XML** or **CSV** report buttons.

The file is downloaded to your specified local directory, or you can open it to view in a separate browser window.

10.7 Enter a Regulation Bilateral Transaction

A bilateral transaction consists of two Steps (from the left navigation bar):

The buyer enters the transaction information.

The seller confirms the transaction information.

The buyer is responsible for initiating regulation bilateral transactions. The seller confirms the transaction. All data must be entered no later than 13:30 the day after the transaction begins. Please note that you will have to click through all the fields, even if there is no change to the data, to exit edit mode and successfully submit the transaction.

The buyer enters the following information on the Regulation Bilaterals web page:

Seller – Indicates the entity selling the fixed amount of regulation indicated to the buyer for the duration indicated.

MW – Indicates the amount of regulation sold for the duration of the transaction.

Start Time – Indicates the date and top of the hour the Regulation Bilateral transaction begins.

Stop Hour – Indicates the date and top of the hour the Regulation Bilateral transaction ends.

Area – A bulk electric system or combination of bulk electric systems bounded by interconnection metering and telemetry to which a common generation control scheme and reserve requirement is applied.

The Regulation Bilaterals web page presents all existing bilateral transactions that span the selected date.

Steps (from the left navigation bar):

Select **Bilaterals**.

Select the **Regulation Bilaterals** tab.

The Regulation Bilaterals web page appears.

Click the Date drop down to select the Month and Year.

The selected date's existing regulation bilateral transactions appears.

Right click to display the **Add Item** action button.

Left click to open a regulation bilateral data entry line.

On the new regulation bilateral data entry line, enter the following:

- MW
- Start Time
- Stop Time
- Area

Select the Sellers Name from the drop down in the column labelled Seller.

The seller's name appears in the Seller field.

Click the Save button.

"Success: Save successful" message is displayed.

To download selected information, click the **XML** or **CSV** report buttons.

The file is downloaded to your specified local directory, or you can open it to view in a separate browser window.

10.8 Confirm a Regulation Bilateral Transaction

A bilateral transaction consists of two Steps:

- The buyer enters the transaction information.
- The seller confirms the transaction information.

The buyer is responsible for initiating regulation bilateral transactions. The seller confirms the transaction.

The seller confirms the transaction information using the Regulation Bilaterals web page.

Steps (from the left navigation bar):

Select **Bilaterals**.

Select the **Regulation Bilaterals** tab.

The Regulation Bilaterals web page appears.

Select the transaction Month/Year in the Date dropdown.

The selected date's existing regulation bilateral transactions appears.

Click in the Confirmation field to select 'Yes' or 'No' from the dropdown.

The selected transaction is confirmed or not confirmed.

Click the **Save** button.

"Success: Save successful" message is displayed.

To download selected information, click the **XML** or **CSV** report buttons.

The file is downloaded to your specified local directory, or you can open it to view in a separate browser window.

10.9 Delete a Regulation Bilateral Transaction

Once entered and confirmed, bilateral transactions may not be changed. The transaction must be deleted and re-entered. Either participant can delete a regulation bilateral transaction. The deletion is interpreted as a change from "End Time" to the current time, unless the transaction has not started. Please note that you will have to click through all the fields, even if there is no change to the data, to exit edit mode and successfully submit the transaction.

Steps (from the left navigation bar):

Select **Bilaterals**.

Select the **Regulation Bilaterals** tab.

The Regulation Bilaterals web page appears.

Click the Date drop down to select the Month and Year.

Click the **Refresh** button.

The regulation bilateral transactions for that Month/Year display.

Select the bilateral transaction to be deleted.

Right click to display the **Remove Item** action button.

Left click on **Remove Item** to delete the bilateral data line.

Click the **Save** button.

“Success: Save successful” message is displayed.

The deleted row will no longer display.

To download selected information, click the **XML** or **CSV** report buttons.

The file is downloaded to your specified local directory, or you can open it to view in a separate browser window.

11.0 Managing Unit Synchronized Reserve Data

11.1 Synchronized Reserve Data Overview

A Synchronized Reserve offer consists of the following data: amount of MWs offered for Synchronized Reserve, Synchronized Reserve offer price, Synchronized Reserve maximum, and Synchronized Reserve status.

Managing Synchronized Reserve offers is accomplished by performing the following general Steps (from the left navigation bar):

- Entering Synchronized Reserve limits
- Submitting a Synchronized Reserve offer, including energy use for condensing resources

The Markets Gateway system is also used to collect the information that is needed for bilateral transactions.

11.2 Which Web Pages Do I Use?

The following web pages are used to view and manage generating unit schedules:

- **Unit Detail** – Use this web page to enter the default daily Synchronized Reserve maximum limit for resources.
- **Synchronized Reserve Market -> Offers** – Use this web page to create daily Synchronized Reserve offers for resources and to modify the status of the daily Synchronized Reserve offer.
- **Synchronized Reserve Market -> Updates** – Use this web page to modify Synchronized Reserve resource availability and parameters on an hourly basis.
- **Bilaterals->Synchronized Reserve Bilaterals** – Use this web page to facilitate a Synchronized Reserve bilateral transaction.

11.3 Enter Synchronized Reserve Limits

Synchronized Reserve limits are defined on a unit basis. The following daily Synchronized Reserve limits are entered in the “Miscellaneous” section of the Unit Detail page:

Synchronized Max (MW) – The maximum value, in MW, of output a resource can achieve in response to a synchronized event. This quantity is defined as the increase in output achievable by the unit in ten (10) minutes.

This is the default Synchronized Maximum Limit. It must be equal to the economic maximum of the unit unless an exception is requested.

The Synchronized Max field appears for all generating units that have Synchronized Reserve Capability, as defined in the primary unit characteristics on the Unit Detail page.

The Synchronized Max field also appears on the Hourly Updates web page, but it only is visible if a qualified unit has been granted an exception due to its physical limitation to be lesser than its economic maximum.

Steps (from the left navigation bar):

Select **Generator**.

Select **Unit**.

Select the **Detail** tab.

The Unit Detail web page appears.

Click the Market Day calendar to select the date.

Select the desired portfolio from the Portfolio list.

The generating units for the selected portfolio appear in the Location list.

Select the generating unit from the Location list.

Click the **Refresh** button.

The data for the selected generating unit appears in the Unit Detail web page.

Enter the following Synchronized Reserve limit in the **Miscellaneous** section:

Synchronized Max

Click the **Save** button.

"Success: Save successful" message is displayed.

To download selected information, click the **XML** or **CSV** report buttons.

The file is downloaded to your specified local directory, or you can open it to view in a separate browser window.

11.4 Submit Synchronized Reserve Offer

Synchronized offers must be submitted for all units that are providing Synchronized Reserve, including units that are self-scheduling Synchronized Reserve or providing Synchronized Reserve to support a bilateral transaction. A synchronized offer consists of the following pieces of data:

- **Offer MW** – The amount of Synchronized Reserve MW offered for the unit. The Synchronized Reserve quantity is defined as the increase in output achievable by the unit in ten (10) minutes. This field is required for ESR and Hydro resources if the resource is either Available or Self-Scheduled to provide Synchronized Reserve. Offer MWs for other resource types will be calculated by PJM.
- **Offer Price** – Must be a positive number; required if the unit is available for Synchronized Reserve. A Synchronized Reserve offer price may not exceed the expected value of the Synchronized Reserve penalty.

Steps (from the left navigation bar):

Select **Generator**.

Select **Synchronized Reserve Market**.

Select the **Offers** tab.

The Synchronized Reserve Market Offers web page appears.

Click the Market Day calendar to select the date.

Select the desired portfolio from the Portfolio list.

The generating units for the selected portfolio appear in the Location list.

Select the generating unit from the Locations list.

The data for the selected generating unit appears on the Synchronized Reserve Market Offers web page.

Enter the following synchronized offer data:

- Offer MW
- Offer Price

Click the **Save** button.

“Success: Save successful” message is displayed.

To download selected information, click the **XML** or **CSV** report buttons.

The file is downloaded to your specified local directory, or you can open it to view in a separate browser window.

11.5 Adjust Synchronized Reserve Resource Availability and Offer

Synchronized Reserve offers may be submitted for specific hours of the operating day. This task is accomplished by editing the Synchronized Reserve Updates page in Markets Gateway. The rows on the Synchronized Reserve Updates page that have been edited will serve as an over-write of the data on the Synchronized Reserve Offers page. All hourly updates must be made at least 35 minutes prior to the start of the operating hour.

The default status of the Synchronized Reserve Updates page displays “null” values in the Offer MW, Offer Price, and Self Scheduled columns. The Availability column displays “Available” for ESR and Hydro resources and null for other resources by default.

Note: If a row on Synchronized Reserve Market Updates page is not edited from the default status, the data on the Synchronized Reserve Market Offers page prevails.

- **Offer MW** – The amount of Synchronized Reserve MW offered for the unit. The Synchronized Reserve quantity is defined as the increase in output achievable by the unit in ten (10) minutes. This field is required for ESR and Hydro resources if the resource is either Available or Self-Scheduled to provide Synchronized Reserve. Offer MWs for other resource types will be calculated by PJM.
- **Offer Price** – Must be a positive number; may be submitted for specific hours and updated in Real Time. A Synchronized Reserve offer price may not exceed the expected value of the Synchronized Reserve penalty. This hourly parameter may only be updated if the resource is opted in to Intraday Offers.
- **Self-Scheduled** – Indicates if the unit will be self-scheduled for Synchronized Reserve.
- **Availability** – Status of the Hydro or ESR resource.

A synchronized reserve offer’s status is one of the following states:

- **Available** – Indicates if the unit is available to provide Synchronized Reserve.
- **Not Available** – Indicates if the unit is unavailable to provide Synchronized Reserve.

Steps (from the left navigation bar):

Select **Generator**.

Select **Synchronized Reserve Market**.

Select the **Updates** tab.

The Synchronized Reserve Updates web page appears.

Click the Market Day calendar to select the date.

Select the desired portfolio from the Portfolio list.

The generating units for the selected portfolio appear in the Location list.

Select the generating unit from the Locations list.

The data for the selected generating unit appears on the Synchronized Reserve Market Updates web page.

Enter the following synchronized availability data:

- Offer MW
- Offer Price
- Self-Scheduled
- Availability

Click the **Save** button.

“Success: Save successful” message is displayed.

To download selected information, click the **XML** or **CSV** report buttons.

The file is downloaded to your specified local directory, or you can open it to view in a separate browser window.

11.6 Enter a Synchronized Reserve Bilateral Transaction

A bilateral transaction consists of two Steps (from the left navigation bar):

- The buyer enters the transaction information.
- The seller confirms the transaction information.

The buyer is responsible for initiating synchronized reserve bilateral transactions. The seller confirms the transaction. All data must be entered no later than by 14:15 the day after the transaction begins.

Please note that you will have to click through all the fields, even if there is no change to the data, to exit edit mode and successfully submit the transaction.

The buyer enters the following information on the Synchronized Reserve Bilaterals web page:

- **Seller** – Indicates the entity selling the fixed amount of synchronized reserve indicated to the buyer for the duration indicated.
- **MW** – Indicates the amount of Synchronized Reserve sold for the duration of the transaction.
- **Start Date Hour** – Indicates the date and top of the hour the Synchronized Reserve Bilateral begins.
- **Stop Date Hour** – Indicates the date and top of the hour the Synchronized Reserve Bilateral ends.
- **Area** – A bulk electric system or combination of bulk electric systems bounded by interconnection metering and telemetry to which a common generation control scheme and reserve requirement is applied.

The Synchronized Bilaterals web page presents all existing bilateral transactions that span the selected date.

Steps (from the left navigation bar):

Select **Bilaterals**.

Select the **Synchronized Reserve Bilaterals** tab.

The Synchronized Reserve Bilaterals web page appears.

Click the Date drop down to select the Month and Year.

The synchronized reserve bilateral transactions for that Month/Year display.

Right click to display the **Add Item** action button.

Left click on **Add Item** to display a new data entry line.

A new row appears on the web page.

Select the Sellers Name from the Participant Selector.

The seller's name appears in the Seller field.

Enter the following data:

- Seller
- MW
- Start Date Hour
- Stop Date Hour
- Area

Select the bilateral transactions to be submitted.

Click the **Save** button.

"Success: Save successful" message is displayed.

To download selected information, click the **XML** or **CSV** report buttons.

The file is downloaded to your specified local directory, or you can open it to view in a separate browser window.

11.7 Confirm a Synchronized Reserve Bilateral Transaction

A bilateral transaction consists of two Steps (from the left navigation bar):

- The buyer enters the transaction information.
- The seller confirms the transaction information.

The buyer is responsible for initiating synchronized reserve bilateral transactions. The seller confirms the transaction.

Please note that you will have to click through all the fields, even if there is no change to the data, to exit edit mode and successfully submit the transaction.

The seller confirms the transaction information using the Synchronized Reserve Bilaterals web page. The following information is entered into the Confirmation field: Yes or No.

Steps (from the left navigation bar):

Select **Bilaterals**.

Select the **Synchronized Reserve Bilaterals** tab.

The Synchronized Reserve Bilaterals web page appears.

Click the Date drop down to select the Month and Year.

The selected date's existing synchronized bilateral transactions appears.

Select 'Yes' or 'No' from the Confirmation field drop down.

The chosen selection is displayed in the field.

Click the **Save** button.

"Success: Save successful" message is displayed.

To download selected information, click the **XML** or **CSV** report buttons.

The file is downloaded to your specified local directory, or you can open it to view in a separate browser window.

11.8 Delete a Synchronized Reserve Bilateral Transaction

Once entered and confirmed, bilateral transactions may not be changed. The transaction must be deleted and re-entered. Either participant can delete a synchronized bilateral transaction. The deletion is interpreted as a change from "End Time" to the current time, unless the transaction has not started.

Please note that you will have to click through all the fields, even if there is no change to the data, to exit edit mode and successfully submit the transaction.

Steps (from the left navigation bar):

Select **Bilaterals**.

Select the **Synchronized Reserve Bilaterals** tab.

The Synchronized Reserve Bilaterals web page appears.

Click the Date drop down to select the Month and Year.

The selected date's existing Synchronized Reserve bilateral transactions appears.

Right click on the synchronized reserve transaction to be deleted.

Select the **Remove Item** action button.

Click the **Save** button.

"Success: Save successful" message is displayed.

To download selected information, click the **XML** or **CSV** report buttons.

The file is downloaded to your specified local directory, or you can open it to view in a separate browser window.

12.0 Managing Unit Non-Synchronized Reserve Data

12.1 Non-Synchronized Reserve Data Overview

A Non-Synchronized Reserve offer consists of the following data: amount of MWs offered for Non-Synchronized Reserves, and Non-Synchronized Reserve status.

Managing Non-Synchronized Reserve offers is accomplished by performing the following general Steps (from the left navigation bar):

- Entering Non-Synchronized Reserve limits
- Submitting a Non-Synchronized Reserve offer

The Markets Gateway system is also used to collect the information that is needed for bilateral transactions.

12.2 Which Web Pages Do I Use?

The following web pages are used to view and manage generating unit schedules:

- **Non-Synchronized Reserve Market -> Offers** – Use this web page to create daily Non-Synchronized Reserve offers for resources and to modify the status of the daily Non-Synchronized Reserve offer.
- **Non-Synchronized Reserve Market -> Updates** – Use this web page to modify Non-Synchronized Reserve resource availability and parameters on an hourly basis.
- **Bilaterals -> Non-Synchronized Reserve Bilaterals** – Use this web page to facilitate a Non-Synchronized Reserve bilateral transaction.

12.3 Submit Non-Synchronized Reserve Offer

Non-Synchronized offers must be submitted for all units that are providing Non-Synchronized Reserve or providing Non-Synchronized Reserve to support a bilateral transaction. A non-synchronized reserve offer consists of the following pieces of data:

- **Offer MW** – The amount of Non-Synchronized Reserve MW offered for the unit. The Non-Synchronized Reserve quantity is defined as the increase in output achievable by the unit in ten (10) minutes. This field is required for Hydro resources if the resource is Available to provide Non-Synchronized Reserve. Offer MWs for other resource types will be calculated by PJM.

Steps (from the left navigation bar):

Select **Generator**.

Select **Non-Synchronized Reserve Market**.

Select the **Offers** tab.

The Non-Synchronized Reserve Market Offers web page appears.

Click the Market Day calendar to select the date.

Select the desired portfolio from the Portfolio list.

The generating units for the selected portfolio appear in the Location list.

Select the generating unit from the Locations list.

The data for the selected generating unit appears on the Non-Synchronized Reserve Market Offers web page.

Enter the following non-synchronized reserve offer data:

- Offer MW

Click the **Save** button.

“Success: Save successful” message is displayed.

To download selected information, click the **XML** or **CSV** report buttons.

The file is downloaded to your specified local directory, or you can open it to view in a separate browser window.

12.4 Adjust Non-Synchronized Reserve Resource Availability and Offer

Non-Synchronized Reserve offers may be submitted for specific hours of the operating day. This task is accomplished by editing the Non-Synchronized Reserve Updates page in Markets Gateway. The rows on the Non-Synchronized Reserve Updates page that have been edited will serve as an over-write of the data on the Non-Synchronized Reserve Offers page. All hourly updates must be made at least 35 minutes prior to the start of the operating hour.

The default status of the Non-Synchronized Reserve Updates page displays “null” values in the Offer MW column, The Availability column displays ‘Available’ for Hydro resources and null for all other resource types by default.

Note: If a row on Non-Synchronized Reserve Market Updates page is not edited from the default status, the data on the Non-Synchronized Reserve Market Offers page prevails.

- **Offer MW** – The amount of Non-Synchronized Reserve MW offered for the unit. The Non-Synchronized Reserve quantity is defined as the increase in output achievable by the unit in ten (10) minutes. This field is required for Hydro resources if the resource is selected as Available to provide Non-Synchronized Reserve. Offer MWs for other resource types will be calculated by PJM.
- **Availability** – Status of the Hydro resource.

A non-synchronized reserve offer’s status is one of the following states:

- **Available** – Indicates if the unit is available to provide Non-Synchronized Reserve.
- **Not Available** – Indicates if the unit is unavailable to provide Non-Synchronized Reserve.

Steps (from the left navigation bar):

Select **Generator**.

Select **Non-Synchronized Reserve Market**.

Select the **Updates** tab.

The Non-Synchronized Reserve Updates web page appears.

Click the Market Day calendar to select the date.

Select the desired portfolio from the Portfolio list.

The generating units for the selected portfolio appear in the Location list.

Select the generating unit from the Locations list.

The data for the selected generating unit appears on the Non-Synchronized Reserve Market Updates web page.

Enter the following non-synchronized reserve data:

- Offer MW
- Availability

Click the **Save** button.

“Success: Save successful” message is displayed.

To download selected information, click the **XML** or **CSV** report buttons.

The file is downloaded to your specified local directory, or you can open it to view in a separate browser window.

12.5 Enter a Non-Synchronized Reserve Bilateral Transaction

A bilateral transaction consists of two Steps (from the left navigation bar):

- The buyer enters the transaction information.
- The seller confirms the transaction information.

The buyer is responsible for initiating non-synchronized reserve bilateral transactions. The seller confirms the transaction. All data must be entered no later than 14:15 the day after the transaction begins.

Please note that you will have to click through all the fields, even if there is no change to the data, to exit edit mode and successfully submit the transaction.

The buyer enters the following information on the Non-Synchronized Reserve Bilaterals web page:

- **Seller** – Indicates the entity selling the fixed amount of Non-Synchronized reserve indicated to the buyer for the duration indicated.
- **MW** – Indicates the amount of Non-Synchronized Reserve sold for the duration of the transaction.
- **Start Time** – Indicates the date and top of the hour the Non-Synchronized Reserve Bilateral transaction begins.
- **Stop Time** – Indicates the date and top of the hour the Non-Synchronized Reserve Bilateral transaction ends.
- **Area** – A bulk electric system or combination of bulk electric systems bounded by interconnection metering and telemetry.

The Non-Synchronized Bilaterals web page presents all existing bilateral transactions that span the selected date.

Steps (from the left navigation bar):

Select **Bilaterals**.

Select the **Non-Synchronized Reserve Bilaterals** tab.

The Non-Synchronized Reserve Bilaterals web page appears.

Click the Date drop down to select the Month and Year.

The selected date's existing Non-Synchronized Reserve bilateral transactions appears.

Select the **Add Item** action button.

A new row appears on the web page.

Select the Sellers Name from the Participant Selector.

The seller's name appears in the Seller field.

Enter the following data:

- Seller

- MW
- Start Date Hour
- Stop Date Hour
- Area

Click the **Save** button.

“Success: Save successful” message is displayed.

To download selected information, click the **XML** or **CSV** report buttons.

The file is downloaded to your specified local directory, or you can open it to view in a separate browser window.

12.6 Confirm a Non-Synchronized Reserve Bilateral Transaction

A bilateral transaction consists of two Steps (from the left navigation bar):

- The buyer enters the transaction information.
- The seller confirms the transaction information.

The buyer is responsible for initiating Non-Synchronized Reserve bilateral transactions. The seller confirms the transaction.

The seller confirms the transaction information using the Non-Synchronized Reserve Bilaterals web page. Please note that you will have to click through all the fields, even if there is no change to the data, to exit edit mode and successfully submit the transaction. The following information is entered: Yes or No.

Steps (from the left navigation bar):

Select **Bilaterals**.

Select the **Non-Synchronized Reserve Bilaterals** tab.

The Non-Synchronized Reserve Bilaterals web page appears.

Click the Date drop down to select the Month and Year.

The selected date's existing non-synchronized bilateral transactions appears.

Select ‘Yes’ or ‘No’ from the Confirmation field drop down.

The chosen selection is displayed in the field.

Click the **Save** button.

“Success: Save successful” message is displayed.

To download selected information, click the **XML** or **CSV** report buttons.

The file is downloaded to your specified local directory, or you can open it to view in a separate browser window.

12.7 Delete a Non-Synchronized Reserve Bilateral Transaction

Once entered and confirmed, bilateral transactions may not be changed. The transaction must be deleted and re-entered. Either participant can delete a non-synchronized bilateral transaction. The deletion is interpreted as a

change from “End Time” to the current time, unless the transaction has not started. Please note that you will have to click through all the fields, even if there is no change to the data, to exit edit mode and successfully submit the transaction.

Steps (from the left navigation bar):

Select **Bilaterals**.

Select the **Non-Synchronized Reserve Bilaterals** tab.

The Non-Synchronized Reserve Bilaterals web page appears.

Click the Date drop down to select the Month and Year.

The selected date's existing Non-Synchronized Reserve bilateral transactions appears.

Right click on the non-synchronized reserve transaction to be deleted.

Select the **Remove Item** action button.

Click the **Save** button.

“Success: Save successful” message is displayed.

To download selected information, click the **XML** or **CSV** report buttons.

The file is downloaded to your specified local directory, or you can open it to view in a separate browser window.

13.0 Managing Unit Secondary Reserve Data

13.1 Secondary Reserve Data Overview

A Secondary Reserve offer consists of the following data: amount of MWs offered for Secondary Reserves, Secondary Reserve maximum, and Secondary Reserve status.

Managing Secondary Reserve offers is accomplished by performing the following general Steps (from the left navigation bar):

- Entering Secondary Reserve limits
- Submitting a Secondary Reserve offer

The Markets Gateway system is also used to collect the information that is needed for bilateral transactions.

13.2 Which Web Pages Do I Use?

The following web pages are used to view and manage generating unit schedules:

- **Unit Detail** – Use this web page to enter the default daily Secondary Reserve maximum limit for resources.
- **Secondary Reserve Market -> Offers** – Use this web page to create daily Secondary Reserve offers for resources and to modify the status of the daily Secondary Reserve offer.
- **Secondary Reserve Market -> Updates** – Use this web page to modify Secondary Reserve resource availability and parameters on an hourly basis.
- **Bilaterals -> Secondary Reserve Bilaterals** – Use this web page to facilitate a Secondary Reserve bilateral transaction.

13.3 Enter Secondary Reserve Limits

Secondary Reserve limits are defined on a unit basis. The following daily Secondary Reserve limits are entered in the “Miscellaneous” section of the Unit Detail page:

Secondary Max (MW) – The maximum value, in MW, of output a resource can achieve in thirty (30) minutes.

This is the default Secondary Maximum Limit. It must be equal to the economic maximum of the unit unless an exception is requested.

The Secondary Max field appears for all generating units that have Secondary Reserve Capability, as defined in the primary unit characteristics on the Unit Detail page.

The Secondary Max field also appears on the Hourly Updates web page, but it only is visible if a qualified unit has been granted an exception due to its physical limitation to be lesser than its economic maximum.

Steps (from the left navigation bar):

Select **Generator**.

Select **Unit**.

Select the **Detail** tab.

The Unit Detail web page appears.

Click the Market Day calendar to select the date.

Select the desired portfolio from the Portfolio list.

The generating units for the selected portfolio appear in the Location list.

Select the generating unit from the Location list.

Click the **Refresh** button.

The data for the selected generating unit appears in the Unit Detail web page.

Enter the following Secondary Reserve limit in the **Miscellaneous** section:

Secondary Max

Click the **Save** button.

“Success: Save successful” message is displayed.

To download selected information, click the **XML** or **CSV** report buttons.

The file is downloaded to your specified local directory, or you can open it to view in a separate browser window.

13.4 Submit Secondary Reserve Offer

Secondary offers must be submitted for all units that are providing Secondary Reserve or providing Secondary Reserve to support a bilateral transaction. A secondary reserve offer consists of the following pieces of data:

- **Offer MW** – The amount of Secondary Reserve MW offered for the unit. The Secondary Reserve quantity is defined as the increase in output achievable by the unit in thirty (30) minutes. This field is required for ESR and Hydro resources if the resource is Available to provide Secondary Reserve. Offer MWs for other resource types will be calculated by PJM.

Steps (from the left navigation bar):

Select **Generator**.

Select **Secondary Reserve Market**.

Select the **Offers** tab.

The Secondary Reserve Market Offers web page appears.

Click the Market Day calendar to select the date.

Select the desired portfolio from the Portfolio list.

The generating units for the selected portfolio appear in the Location list.

Select the generating unit from the Locations list.

The data for the selected generating unit appears on the Secondary Reserve Market Offers web page.

Enter the following secondary reserve offer data:

- Offer MW

Click the **Save** button.

“Success: Save successful” message is displayed.

To download selected information, click the **XML** or **CSV** report buttons.

The file is downloaded to your specified local directory, or you can open it to view in a separate browser window.

13.5 Adjust Secondary Reserve Resource Availability and Offer

Secondary Reserve offers may be submitted for specific hours of the operating day. This task is accomplished by editing the Secondary Reserve Updates page in Markets Gateway. The rows on the Secondary Reserve Updates page that have been edited will serve as an over-write of the data on the Secondary Reserve Offers page. All hourly updates must be made at least 35 minutes prior to the start of the operating hour.

The default status of the Secondary Reserve Updates page displays “null” values in the Offer MW column. The Availability column displays ‘Available’ for Hydro and ESR resources and null for all other resource types by default.

Note: If a row on Secondary Reserve Market Updates page is not edited from the default status, the data on the Secondary Reserve Market Offers page prevails.

- **Offer MW** – The amount of Secondary Reserve MW offered for the unit. The Secondary Reserve quantity is defined as the increase in output achievable by the unit in thirty (30) minutes. This field is required for ESR and Hydro resources if the resource is selected as Available to provide Secondary Reserve. Offer MWs for other resource types will be calculated by PJM.
- **Availability** – Status of the Hydro or ESR resource.

A secondary reserve offer’s status is one of the following states:

- **Available** – Indicates if the unit is available to provide Secondary Reserve.
- **Not Available** – Indicates if the unit is unavailable to provide Secondary Reserve.

Steps (from the left navigation bar):

Select **Generator**.

Select **Secondary Reserve Market**.

Select the **Updates** tab.

The Secondary Reserve Updates web page appears.

Click the Market Day calendar to select the date.

Select the desired portfolio from the Portfolio list.

The generating units for the selected portfolio appear in the Location list.

Select the generating unit from the Locations list.

The data for the selected generating unit appears on the Secondary Reserve Market Updates web page.

Enter the following secondary reserve data:

- Offer MW
- Availability

Click the **Save** button.

“Success: Save successful” message is displayed.

To download selected information, click the **XML** or **CSV** report buttons.

The file is downloaded to your specified local directory, or you can open it to view in a separate browser window.

13.6 Enter a Secondary Reserve Bilateral Transaction

A bilateral transaction consists of two Steps (from the left navigation bar):

- The buyer enters the transaction information.
- The seller confirms the transaction information.

The buyer is responsible for initiating secondary reserve bilateral transactions. The seller confirms the transaction. All data must be entered no later than 14:15 the day after the transaction begins.

Please note that you will have to click through all the fields, even if there is no change to the data, to exit edit mode and successfully submit the transaction.

The buyer enters the following information on the Secondary Reserve Bilaterals web page:

- **Seller** – Indicates the entity selling the fixed amount of Secondary reserve indicated to the buyer for the duration indicated.
- **MW** – Indicates the amount of Secondary Reserve sold for the duration of the transaction.
- **Start Time** – Indicates the date and top of the hour the Secondary Reserve Bilateral transaction begins.
- **Stop Time** – Indicates the date and top of the hour the Secondary Reserve Bilateral transaction ends.
- **Area** – A bulk electric system or combination of bulk electric systems bounded by interconnection metering and telemetry.

The Non-Synchronized Bilaterals web page presents all existing bilateral transactions that span the selected date.

Steps (from the left navigation bar):

Select **Bilaterals**.

Select the **Secondary Reserve Bilaterals** tab.

The Secondary Reserve Bilaterals web page appears.

Click the Date drop down to select the Month and Year.

The selected date's existing Secondary Reserve bilateral transactions appears.

Select the **Add Item** action button.

A new row appears on the web page.

Select the Sellers Name from the Participant Selector.

The seller's name appears in the Seller field.

Enter the following data:

- Seller
- MW

- Start Date Hour
- Stop Date Hour
- Area

Click the **Save** button.

"Success: Save successful" message is displayed.

To download selected information, click the **XML** or **CSV** report buttons.

The file is downloaded to your specified local directory, or you can open it to view in a separate browser window.

13.7 Confirm a Secondary Reserve Bilateral Transaction

A bilateral transaction consists of two Steps (from the left navigation bar):

- The buyer enters the transaction information.
- The seller confirms the transaction information.

The buyer is responsible for initiating Secondary Reserve bilateral transactions. The seller confirms the transaction.

The seller confirms the transaction information using the Secondary Reserve Bilaterals web page. Please note that you will have to click through all the fields, even if there is no change to the data, to exit edit mode and successfully submit the transaction. The following information is entered: Yes or No.

Steps (from the left navigation bar):

Select **Bilaterals**.

Select the **Secondary Reserve Bilaterals** tab.

The Secondary Reserve Bilaterals web page appears.

Click the Date drop down to select the Month and Year.

The selected date's existing secondary reserve bilateral transactions appears.

Select 'Yes' or 'No' from the Confirmation field drop down.

The chosen selection is displayed in the field.

Click the **Save** button.

"Success: Save successful" message is displayed.

To download selected information, click the **XML** or **CSV** report buttons.

The file is downloaded to your specified local directory, or you can open it to view in a separate browser window.

13.8 Delete a Secondary Reserve Bilateral Transaction

Once entered and confirmed, bilateral transactions may not be changed. The transaction must be deleted and re-entered. Either participant can delete a secondary reserve bilateral transaction. The deletion is interpreted as a change from "End Time" to the current time, unless the transaction has not started. Please note that you will have to

click through all the fields, even if there is no change to the data, to exit edit mode and successfully submit the transaction.

Steps (from the left navigation bar):

Select **Bilaterals**.

Select the **Secondary Reserve Bilaterals** tab.

The Secondary Reserve Bilaterals web page appears.

Click the Date drop down to select the Month and Year.

The selected date's existing Secondary Reserve bilateral transactions appears.

Right click on the secondary reserve transaction to be deleted.

Select the **Remove Item** action button.

Click the **Save** button.

"Success: Save successful" message is displayed.

To download selected information, click the **XML** or **CSV** report buttons.

The file is downloaded to your specified local directory, or you can open it to view in a separate browser window.

14.0 Managing Hourly Unit Data

14.1 Hourly Update Overview

The Operating Company can reflect real-time changes to the MW limits and status of the unit by using the Unit Hourly Updates web page. Changes made to the unit data using the Unit Hourly Updates web page supersede all schedule data (Schedule Detail web page), weather curve data (Unit Detail web page) and unit limits (Unit Detail web page).

14.2 Which Web Pages Do I Use?

The Operating Company uses the following web pages to submit hourly updates to PJM:

- **Generator->Unit->Hourly Updates** – Use this page to submit updated unit statuses and MW operating limits. All hourly updates can be made up to the end of the current operating hour.
- **Regulation Market-> Updates** – Use this page to submit updated regulation offers and regulation limits. All hourly updates can be made 35 minutes prior to the operating hour.
- **Regulation Market-> Availability Updates** – Use this page to submit updated regulation availability. All interval updates can be made up to 35 minutes prior to the operating interval. (Unavailable, Economic, Self-Scheduled)
- **Synchronized Reserve Market->Updates** – Use this page to submit updated Synchronized Reserve statuses and Synchronized Reserve limits. All hourly updates can be made 35 minutes prior to the operating hour.

- **Non-Synchronized Reserve Market->Updates** – Hydro units use this page to submit updated Non-Synchronized Reserve statuses and Non-Synchronized Reserve limits. All hourly updates can be made 35 minutes prior to the operating hour.
- **Secondary Reserve Market->Updates** – Hydro and Energy Storage Resources use this page to submit updated Secondary Reserve statuses and Secondary Reserve limits. All hourly updates can be made 35 minutes prior to the operating hour.

14.3 Submit Revised MW Operating Limits

If the Operating Company needs to revise the MW operating limits to reflect real-time changes, the following information on the Unit Hourly Updates web page is entered:

Emer. Min. MW – Lowest level of energy in MW the unit can produce and maintain a stable level of operation. The owning company operates the unit at this level during a Minimum Generation Emergency. This value overrides the Emergency Minimum Limit (entered on the Unit Detail and Schedule Details web pages) for this generating unit. For a wind resource, this value must be less than or equal to the resource's CIR value. Submitting a value greater than the CIR value will trigger a warning message indicating that the Economic Min value will be capped at the Emergency Min value in the Real Time market clearing engine.

Econ. Min. MW – The minimum energy available from the unit for economic dispatch. This value overrides the Economic Minimum Limit (entered on the Unit Detail and Schedule Details web pages) for this generating unit. CTs are permitted to provide an Economic Minimum Limit less than the physical economic minimum value of the unit. For a wind resource, the Economic Min must be less than or equal to the resource's CIR value. Submitting a value greater than the CIR value will trigger a warning message indicating that the Economic Min value will be capped at the CIR value in the Real Time market clearing engine.

Econ. Max. MW – The highest unrestricted level of energy, in MW, that the operating company operates the unit. This represents the highest output available from the unit for economic dispatch. This value overrides the Economic Max Limit (entered on the Unit Detail and Schedule Details web pages) for this generating unit.

Emer. Max. MW – The MW energy level at which the operating company operates the generating unit once PJM requests Maximum Emergency Generation. This represents the highest short-term MW level a generating unit can produce and may require extraordinary procedures to produce the desired output. This overrides the Emergency Max Limit (entered on the Unit Detail and Schedule Details web pages) for this generating unit.

Synch. Max. MW – The maximum MW energy level that the unit can provide to support Synchronized Reserves.

Secondary Max. MW – The maximum MW energy level that the unit can provide to support Secondary Reserves.

Commit Status – User can set their Unit to be in any one of 4 modes for the hour (see next section below for more information).

Fixed Gen – This field should be set to Yes if a generation resource intends to remain "fixed" or otherwise not follow PJM real-time dispatch. The default value is "No". (see next section below for more information).

Steps (from the left navigation bar):

Select **Generator**.

Select **Unit**.

Select the **Hourly Updates** tab.

The Hourly Updates web page appears.

Select the current Operating Day.

Select the desired portfolio from the Portfolio list.

The generating units for the selected portfolio appear in the Location list.

Select the generating unit from the Location list.

The data for the selected generating unit appears on the Hourly Updates web page.

Enter data for the following operating limits for the specific hours for which to modify the operating limits:

- Emer. Max. MW
- Econ. Max. MW
- Econ. Min. MW
- Emer. Min. MW
- Synch. Max. MW
- Secondary Max. MW
- Commit Status
- Fixed Gen

Click the **Save** button.

“Success: Save successful” message is displayed.

To download selected information, click the **XML** or **CSV** report buttons.

The file is downloaded to your specified local directory, or you can open it to view in a separate browser window.

14.4 Revise the Status of a Generating Unit

During the Operating Day, the Operating Company can revise the status of the generating unit. The following unit status information is presented on the Unit Hourly Updates web page:

Available choices for Commit Status:

- **Economic** – Indicates whether a unit is available for normal economic dispatch.
- **Emergency** – Indicates whether a unit is available only for emergency dispatch.
- **Must Run** – Indicates that the generating unit is self-scheduling.
- **Unavailable** – Indicates whether the unit is available.

Only one of the above statuses may be selected for a unit at a time

Fixed Gen – This field should be set to Yes if a generation resource intends to remain “fixed” or otherwise not follow PJM real-time dispatch. This flag will be fed into the PJM Unit Dispatch System and will tell the system that the unit will

not be responding to PJM dispatch signals. This information is needed to maintain an accurate overall dispatch solution as possible, and PJM encourages all generation not intending to follow dispatch to check this field. The fixed gen field is not used at all in the PJM settlement calculations and therefore will have no direct effect on operating reserve eligibility. The field is not used by the Day-Ahead market.

Steps (from the left navigation bar):

Select **Generator**.

Select **Unit**.

Select the **Hourly Updates** tab.

The Unit Hourly Updates web page appears.

Select the current Operating Day.

Select the desired portfolio from the Portfolio list.

The generating units for the selected portfolio appear in the Location list.

Select the generating from the Location list.

The data for the selected generating unit appears on the Hourly Updates web page.

Enter data for the specific hours for which to modify the unit status:

Select one of the following statuses:

- Unavailable
- Economic
- Emergency
- Must Run

Modify the following fields for the specific hours selected:

- Fixed Gen

Click the **Save** button.

“Success: Save successful” message is displayed.

To download selected information, click the **XML** or **CSV** report buttons.

The file is downloaded to your specified local directory, or you can open it to view in a separate browser window.

15.0 Managing Demand Portfolios

15.1 Demand Portfolio Overview

Some demand users are responsible for submitting demand bids for over twenty nodes. Managing this amount of data can be challenging. Demand portfolios are a method of managing these large amounts of data by enabling Market Participants to screen price node information so that only demand nodes of interest are displayed.

A demand portfolio is a collection of price nodes that are defined by the demand user. The demand user names each portfolio when it is created. There is currently no limit to the number of demand portfolios a demand user can create; nor is there a limit to the number of price nodes that can be "assigned" to a portfolio. The same price node can be assigned to more than one portfolio.

You may want to consider the following information when defining demand portfolios:

- Geographic location of price nodes

15.2 Which Web Pages Do I Use?

Demand users use the following web pages to manage demand portfolios:

- **Portfolio Manager** – Use this page to view existing demand portfolios and to create, update and delete demand portfolios.

You can determine the price nodes that are currently defined for a portfolio by viewing any of these web pages and viewing the Location List.

15.3 View Existing Demand Portfolios

Data is filtered by demand portfolio on many web pages, including:

- Day-Ahead Demand Bids
- Demand Market Results

You can determine the price nodes that are currently defined for a portfolio by viewing any of these web pages and viewing the Nodes list.

Steps (from the left navigation bar):

Select any of the **Demand** web pages:

Select the desired portfolio from the Portfolio list.

The pricing nodes for the selected portfolio appear in the Location list.

Review the defined pricing nodes in the Location list for the selected portfolio.

15.4 Create New Demand Portfolios

There is currently no limit to the number of portfolios that a demand user can create. After creating a new demand portfolio, the demand user can view other web pages and filter the data by applying one of the user- or PJM-defined portfolios. The demand user enters the following data when creating a new demand portfolio:

- **Portfolio** – The name of a demand portfolio, which is a collection of price nodes. Portfolios can be used by Market Participants to filter the data presented on the web pages to show only subsets of the price nodes for which the user is responsible for submitting data.
- **Location** – The published name of the price node known by the participants and used for bidding. This label appears in the Nodes Selector List on the Demand web pages.

Steps (from the left navigation bar):

Select **System Utilities**.

Select the **Portfolios** tab.

The Portfolios web page appears.

Note that 3 columns will display: Portfolios, Portfolio's Locations and Participant's Available Locations.

Right-click in the white space under the Portfolios column and click the **Create** button.

*The **New Portfolio** pop-up text box displays.*

Enter the name of the new portfolio in the Name field.

Click on the arrow to choose the portfolio type in the Type field.

Click the Submit button to create a new portfolio or click Cancel to return to the list of Portfolios.

The new portfolio appears in the full list of Portfolios.

Note that a Location must be added to the Portfolio in order to save the newly added portfolio.

Continue to the next set of Steps to Add Price Node to Demand Portfolio.

15.5 Add Price Node to Demand Portfolio

A demand user can add price nodes to existing portfolios. There is currently no limit to the number of price nodes that can be assigned to a portfolio. A price node can be assigned to more than one demand portfolio.

Steps (from the left navigation bar):

Select **System Utilities**.

Select the **Portfolios** tab.

The Portfolios web page appears.

Note that 3 columns will display: Portfolios, Portfolio's Locations and Participant's Available Locations.

Locate the Portfolio to which a new location is to be added.

Click on the row containing the name of the Portfolio to add locations.

Locations can be found by using the vertical scroll bar to the far right or the filter boxes at the top of the columns.

Click on the row located in the list of Participant's Available Locations to select a location.

Locate the block of 4 single and double arrow buttons adjacent to the Location list.

Click on the left arrow button to add a location to the Portfolio.

The selected Location appears in the center set of columns containing the Portfolio's Locations.

Repeat the row selection and addition for as many Locations that are to be included in the Portfolio.

Note that clicking on the double arrow will add ALL available locations to the portfolio.

Click the **Save** button to retain the Portfolio with its new Location(s).

“Success: Save successful” message is displayed.

15.6 Delete Demand Portfolio

A demand user can delete an entire demand portfolio or a price node within a portfolio. Once a portfolio is deleted, the price nodes assigned to that portfolio are deleted as well.

Steps (from the left navigation bar):

Select **System Utilities**.

Select the **Portfolios** tab.

The Portfolios web page appears.

Select and highlight the portfolio's name in the Portfolio field.

Select the **Remove** button to delete the selected portfolio.

The portfolio disappears from the Portfolio list.

Click the **Save** button to delete the portfolio or click Refresh to retain the portfolio.

“Success: Save successful” message is displayed.

15.7 Delete Price Node from a Demand Portfolio

A demand user can remove a price node from a defined demand portfolio.

Steps (from the left navigation bar):

Select **System Utilities**.

Select the **Portfolios** tab.

The Portfolios web page appears.

Select and click the portfolio's name in the Portfolio field.

The row will become highlighted.

Select a generating unit by click in the center column.

The row color will become highlighted.

Locate the block of 4 single and double arrow buttons adjacent to the Location list.

Click on the right arrow button to remove a location from the Portfolio.

Click the **Save** button to confirm the removal of location from the Portfolio.

The Save Successful message displays, the row disappears, and the Location is deleted.

16.0 Viewing Private Demand Information

There are three types of information available to Day-Ahead Market Participants and other interested users:

- Private demand information
- Private generation information
- Public information

Private demand information includes Day-Ahead demand schedules and Day-Ahead LMPs and private demand messages.

16.1 Which Web Pages Do I Use?

The following web pages are used to view private demand information:

Demand Market Results — Use this web page to view the Day-Ahead demand schedules for cleared demands bids as well as the Day-Ahead LMPs.

16.2 View Day-Ahead Demand Schedules & LMPs

A demand user can view the results of the Day-Ahead market, which include the demand schedules and the LMPs for each hour. The following demand information is presented:

- **Location** – The published name of the price node known by the participants and used for bidding. This label appears in the Nodes Selector List on the Demand web pages.
- **MW** – The demand MW cleared at the node. This includes the cleared fixed demand bids and price-sensitive demand bids,
- **Price** – Day-Ahead LMP at the node.

Steps (from the left navigation bar):

Select **Demand** button.

Select **Market Results** tab.

The Demand Market Results web page appears.

Click the Market Day calendar to select the date.

Select the desired portfolio from the Portfolio list.

The list of pricing nodes included in the selected portfolio appears in the Location List.

Select the pricing node from the Location list.

The data for the selected Location appears on the Market Results web page.

Review the following information for each pricing node in the portfolio for each hour:

- Location
- MWs
- Prices
- Total Portfolio MW

To download selected information, click the XML or CSV report buttons.

The file is downloaded to your specified local directory, or you can open it to view in a separate browser window.

17.0 Managing Demand Bids

17.1 Demand Bid Overview

Demand users submit demand bids using the MUI. A demand user can submit fixed demand bids or price-sensitive demand bids. A demand user can also submit increment offers and decrement bids.

17.2 Which Web Pages Do I Use?

The following web pages are used to view and manage demand bid data:

- **Distribution Factors Hourly** – Use this web page to modify price node aggregate distributions.
- **Day-Ahead Demand Bids** – Use this web page to submit fixed and price-sensitive demand bids.

17.3 Update Distribution Factors

For the Day-Ahead Market, the Electric Distribution Company (EDC) specifies the transmission zone, the bus distributions and the aggregate bus distributions, or aggregate factors. The default distribution for the transmission zone is PJM's state estimator distribution for that zone for each corresponding hour of the Operating Day one week prior. The EDC can modify the default aggregate factors for a transmission zone only after the state estimator populates the default distribution.

The following information is presented on the Distribution Factors Hourly web page:

- **Hour** – The selected hour of the market day for which the distribution factors apply.
- **Bus Node Location** – The name of the individual price node included in the aggregate node.
- **Factor** – The amount of electricity that is distributed to the price node, expressed as a fractional percentage. The sum of the factors for any aggregate node should be 1.0 (The SPD software normalizes the distribution). The default value is the PJM state estimator value from one week prior to the Operating Day.

Steps (from the left navigation bar):

Select **Demand**.

Select the **Distribution Factors Hourly** tab.

The Distribution Factors Hourly web page appears.

Click the **Market** Day calendar to select the date.

Select the desired demand portfolio from the Portfolios List.

The price nodes included in the portfolio appear in the Location List.

Select the desired price node from the Location List.

The data for the selected location appears.

Select the hour(s) for which the distribution factors should apply.

Only data for the selected hour(s) will appear. The default is all 24 hours of the Market Day.

Click on the Bus Node Location row with the Factor to be revised.

The text entry box for the factor will be editable on the highlighted row.

Revise the factor.

Click the **Save** button.

“Success: Save successful” message is displayed.

To download selected information, click the **XML** or **CSV** report buttons.

The file is downloaded to your specified local directory, or you can open it to view in a separate browser window.

17.4 Submit Fixed Demand Bids

A demand user can submit fixed demand bids and price-sensitive demand bids. A fixed demand bid does not have a price associated with it. A valid fixed demand bid consists of entering the following information on the Demand Bids web page:

Hour – The trading interval of one hour, identified by the time at the end of that hour, for which the bid is valid.

Fixed Demand – Fixed demand bid, expressed in MW. The default is zero MW.

Steps (from the left navigation bar):

Select **Demand**.

Select the **Day-Ahead Demand Bids** tab.

The Day-Ahead Demand Bids web page appears.

Click the Market Day calendar to select the date.

Select the desired demand portfolio from the Portfolios List.

The price nodes included in the portfolio appear in the Location List.

Select the desired price node from the Location List.

Click the **Refresh** button.

The data for the selected location appears.

The Demand Bid Cap for the corresponding zone appears.

Click on the row with the hour for which the bid is to be submitted.

The row is highlighted.

Enter the bid in the text box which opens in the **Fixed Demand** field.

Note that the checkmark box on the left of the row **must** have a checkmark in order to **save**.

Click the **Save** button.

“Success: Save successful” message is displayed.

Repeat for any other bids that are either the same or different that are to be added individually.

To submit the same fixed demand for more than 1 hour, follow these steps:

Click on the row with the hour for which the bid is to be submitted.

Enter the bid in the text box which opens in the Fixed Demand field.

Right click to display the **Copy Hourly Block** action button.

Left click on **Copy Hourly Block**.

Hold down the Shift key and click on the first hour to where the bid is to be copied.

The block of rows will become highlighted.

Entry rows for all hours will appear.

Right click to display the **Paste Hourly Block** action button.

Left click on **Paste Hourly Block**.

The value originally entered now appears in the Fixed Demand field of all selected rows.

Click the **Save** button.

“Success: Save successful” message is displayed.

If the total demand MW in any hour exceeds the Demand Bid Cap for current zone, the submission will be rejected, and an error message will appear on the page.

To download selected information, click the **XML** or **CSV** report buttons.

The file is downloaded to your specified local directory, or you can open it to view in a separate browser window.

17.5 Submit Price Sensitive Demand Bids

A demand user can submit fixed demand bids and price-sensitive demand bids. A valid price sensitive demand bid consists of entering the following information on the Demand Bids web page:

Hour – The trading interval of one hour, identified by the time at the end of that hour, for which the bid is valid.

MW – The MW bid for this price-sensitive bid segment. The default value is 0.0 MW.

Price – The bid price for this segment of a price-sensitive bid. The default value is \$0.00.

Steps (from the left navigation bar):

Select **Demand**.

Select the **Day-Ahead Demand Bids** tab.

The Day-Ahead Demand Bids web page appears.

Click the Market Day calendar to select the date.

Select the desired demand portfolio from the Portfolios List.

The price nodes included in the portfolio appear in the Location List.

Select the desired price node from the Location List.

Click the **Refresh** button.

The data for the selected location appears.

The Demand Bid Cap for the corresponding zone appears.

Left click on the hour where the bid is to be entered to highlight the row.

Left click on **Add Segment** to open a Price Sensitive Demand Bid data entry line for the highlighted row.

On the new Day-Ahead Demand Bid data entry line, enter the following:

- MW
- Price

Note that the checkmark box on the left of the row **must** have a checkmark in order to **save**.

Click the **Save** button.

“Success: Save successful” message is displayed.

If the total demand MW in any hour exceeds the Demand Bid Cap for current zone, the submission will be rejected, and an error message will appear on the page.

To download selected information, click the **XML** or **CSV** report buttons.

The file is downloaded to your specified local directory, or you can open it to view in a separate browser window.

17.6 Copy Demand Bids

A demand user can copy demand bids from an existing day to a future day. A Valid bid consists of entering the following information on the Demand Bids web page:

Hour – The trading interval of one hour, identified by the time at the end of that hour, for which the bid is valid.

MW – Demand bid, expressed in MW. The default is zero MW.

Price – The bid price for this segment of a price-sensitive bid. The default value is \$0.00.

Steps (from the left navigation bar):

Select **Demand**.

Select the **Day-Ahead Demand Bids** tab.

The Day-Ahead Demand Bids web page appears.

Click the Market Day calendar to select the date of the source bid(s).

Select the desired demand portfolio from the Portfolios List.

The price nodes included in the portfolio appear in the Location List.

Select the desired price node from the Location List.

The data for the selected location appears.

The Demand Bid Cap for the corresponding zone appears.

Right click on the page that contains the bids to be copied.

Left click on the **Copy Hours 1 - 24** action button.

Click the Market Day calendar to select the future date.

Right click on the page to where the bids are to be copied.

Left click on the **Paste All** action button.

The rows now display the bids from the source date.

Click the **Save** button.

“Success: Save successful” message is displayed.

If the total demand MW in any hour exceeds the Demand Bid Cap for current zone, the submission will be rejected, and an error message will appear on the page.

To download selected information, click the **XML** or **CSV** report buttons.

The file is downloaded to your specified local directory, or you can open it to view in a separate browser window.

18.0 Managing Increment Offers & Decrement Bids

18.1 Increment Offers and Decrement Bids Overview

Increment offers and decrement bids are used to indicate the prices at which a Market Participant is willing to increase an injection (increment offer) or decrease a withdrawal (decrement bid) in response to PJM's dispatch instructions in the Day-Ahead market.

Increment offers and decrement bids can be submitted at any PJM hub, node at which physical generation or load is settled, Residual Metered Load and interface point not described in Tariff Attachment K – Appendix, Section 2.6(A)(b). The eligible bidding locations are located at <https://www.pjm.com/markets-and-operations/energy.aspx>. Increment offers and decrement bids are supported in the Day-Ahead market only.

An increment offer or decrement bid can be used to:

- Cover one side of a bilateral transaction.
- Cover an eSchedules deal.
- Protect a Day-Ahead generation offer.
- Cover congestion

18.2 Which Web Pages Do I Use?

The following web pages are used to view and manage increment offers and decrement bids:

- **Increment Offers** – Use this web page to submit increment offers.
- **Decrement Bids** – Use this web page to submit decrement bids.
- **Market Results** – Use this web page to view cleared increment offers and decrement bids.

18.3 Submit Increment Offers

Increment offers look like spot market sales or dispatchable resources. An increment offer can be submitted at any PJM hub, node at which physical generation or load is settled, Residual Metered Load and interface point not described in Tariff Attachment K – Appendix, Section 2.6(A)(b).

A valid increment offer consists of the following data being entered on the Inc/Dec web page:

- **Location** – Any PJM hub, residual metered aggregate, aggregate, interface or single bus at which physical generation or load is settled.
- **MW** – The offer (increment offer), in MW, for this segment. The default value is 0 MW.
- **Price** – The offer (increment offer) price for this segment. The default value is \$0.00.

Note – The maximum number of MW/Price segments that can be submitted per hour is 20 segments.

Steps (from the left navigation bar):

Select **Virtual**.

Select the **Increment Offers** tab.

The Increment Offers web page appears.

Click the Market Day calendar to select the date.

Select the desired portfolio from the Portfolios List.

The price nodes included in the portfolio appear in the Location List.

Select the desired price node from the Location List.

The data for the selected price node appears.

Right click to display the **Add Segment** action button.

Select **Add Segment**.

Entry rows for specified hour will appear.

Enter the following data in each desired hour:

- MW
- Price

Click the **Save** button.

“Success: Save successful” message is displayed.

To download selected information, click the **XML** or **CSV** report buttons.

The file is downloaded to your specified local directory, or you can open it to view in a separate browser window.

18.4 Submit Decrement Bids

Decrement bids look like spot market purchases or price-sensitive demand. A valid decrement bid consists of the following data elements being entered on the Inc/Dec web page:

- **Location** – Any PJM hub, residual metered aggregate, aggregate, interface or single bus at which physical generation or load is settled.
- **MW** – The bid (decrement bid), in MW, for this segment. The default value is 0 MW.
- **Price** – The bid (decrement bid) price for this segment. The default value is \$0.00.

Note – The maximum number of MW/Price segments that can be submitted per hour is 20 segments.

Steps (from the left navigation bar):

Select **Virtual**.

Select the **Decrement Bids** tab.

The Decrement Bids web page appears.

Click the Market Day calendar to select the date.

Select the desired portfolio from the Portfolios List.

The price nodes included in the portfolio appear in the Location List.

Select the desired price node from the Location List.

The data for the selected price node appears.

Right click to display the **Add Segment** action button.

Select **Add Segment**.

Entry rows for specified hour will appear.

Enter the following data in each desired hour:

- MW
- Price

Click the **Save** button.

"Success: Save successful" message is displayed.

To download selected information, click the **XML** or **CSV** report buttons.

The file is downloaded to your specified local directory, or you can open it to view in a separate browser window.

18.5 View Cleared Increment Offers & Decrement Bids

Cleared increment offers and decrement bids are presented on the Virtual Market Results web page by Portfolio. The following information is presented:

- **Location** – The published name of the price node known by the participants and used for bidding. This label appears in the Nodes Selector List on the Demand web pages.
- **Cleared Increment/Decrement MWs** – The demand MW cleared at the node. This includes the cleared inc offers and dec bids. Cleared dec bids are represented by positive MWs; cleared inc offers are represented by negative MWs.
- **Price** – LMP at the node.
- **Total Portfolio MW** – The total MW scheduled for each hour for the unit in the portfolio that is currently being viewed.

Steps (from the left navigation bar):

Select **Virtual**.

Select the **Market Results** tab.

The Virtual Market Results web page appears.

Select the desired portfolio from the Portfolio List.

The list of generating units included in the selected portfolio appears in the Location List.

Click the Market Day calendar to select the date.

The selected Operating Day's cleared virtual transactions & LMPs will appear.

Review the following information for each price node in the portfolio for each hour:

- Location
- Cleared Inc/Dec MWs
- Prices

- Total Portfolio MW

To download selected information, click the **XML** or **CSV** report buttons.

The file is downloaded to your specified local directory, or you can open it to view in a separate browser window.

18.6 Copy Increment Offers/Decrement Bids

A demand user can copy increment offers and decrement bids from an existing day to a future day. A valid bid consists of entering the following information on the Inc/Dec Bids web page:

- **Location** – Any PJM hub, residual metered aggregate, aggregate, interface or single bus at which physical generation or load is settled.
- **MW** – The bid (decrement bid) or offer (increment offer) MW value for this segment. The default value is 0 MW.
- **Price** – The bid (decrement bid) or offer (increment offer) price for this segment. The default value is \$0.00.

Steps (from the left navigation bar):

Select **Virtual**.

To Copy Increment Offers, select the **Increment Offers** tab.

The Increment Offers web page appears.

To Copy Decrement Bids, select the **Decrement Bids** tab.

The Decrement Bids web page appears.

Select the desired portfolio from the Portfolios List.

The price nodes included in the portfolio appear in the Location List.

Select the desired price node from the Location List.

The data for the selected price node appear.

Select the desired source date.

Select the desired future date.

Right click to display the **Copy All** action button.

Select **Copy All** action button.

To download selected information, click the XML or CSV report buttons.

The file is downloaded to your specified local directory, or you can open it to view in a separate browser window.

19.0 Managing Up-To Transactions

19.1 Up-To-Transaction Bids Overview

Up-To-Transaction bids are used in Day-Ahead Energy Market to hedge the exposure to price differentials from the source to the sink of the physical energy deliveries into, out of, or through PJM in the Real-Time Energy Market.

Up-To-Transaction bids can be submitted at any of the possible combinations of source and sink points mentioned in the file “Valid Bidding Locations for UTC Bids” located at <https://www.pjm.com/markets-and-operations/energy.aspx> on the PJM Energy Market website. Up-To-Transactions are supported in the Day-Ahead Market only.

19.2 Which Web Pages Do I Use?

The following web pages are used to view and manage Up-To Transaction bids:

- **Up-To Transaction Input** – Use this web page to submit Up-To Transaction Bids.
- **Up-To Transaction Results** – Use this web page to view cleared Up-To Transaction bids.

19.3 Submit Up-To Transaction Bids

A valid Up-To Transaction bid consists of the following data being entered on the Up-To Transactions Input web page:

- **Source and Sink** – any source and sink combination point from the file “Valid Bidding Locations for UTC Bids” located at <https://www.pjm.com/markets-and-operations/energy.aspx> on the PJM Energy Market website.
- **MW** – The Up-To Transaction Bid in MW. The default value is 0 MW.
- **Price** – The Up-To Transaction Bid price. The default value is \$0.00.

Steps (from the left navigation bar):

Select **Up-To-Transaction**.

Select the **Input** tab.

The Up-To-Transaction web page appears.

Click the Market Day calendar to select the date.

Click the **New Transaction** button.

Select the desired source from the source list and sink from the sink list.

The source and sink point combination should be from the file “Valid Bidding Locations for UTC Bids” located at:

<https://www.pjm.com/markets-and-operations/energy.aspx> on the PJM website.

Select the desired hours from the hourly values apply list.

Use ALL to put Up-To-Transactions for all hours, peak hours and off-peak hours respectively.

Enter the following data:

- MW
- Price

Click the **Save** button.

To download selected information, click the **XML** or **CSV** report buttons.

The file is downloaded to your specified local directory, or you can open it to view in a separate browser window.

19.4 View Cleared Up-To-Transaction Bids

Cleared Up-To Transaction results are presented in Up-To Transaction Results webpage. The following information is presented:

- **Hour** – Hours for which Up-To-Transactions are placed by Market Participants.
- **Cleared MW** – The Cleared MWs for the corresponding Up-To-Transaction bid as selected from Transaction list.
- **Source LMP** – LMP for the Source node of the selected up-to-transaction bid.
- **Sink LMP** – LMP for the Sink node of the selected up-to-transaction bid.

Steps (from the left navigation bar):

Select the **Up-To Transaction**.

Select the **Results** tab.

Select the up-to transaction for which you want to see the results from the transaction list.

Review the following information for the selected up-to transaction bid.

- Hour
- Cleared MW
- Source LMP
- Sink LMP

To download selected information, click the **XML** or **CSV** report buttons.

The file is downloaded to your specified local directory, or you can open it to view in a separate browser window.

19.5 Copy Up-To Transaction Bids

A demand user can copy up-to-transaction bids from an existing day to a future day:

Steps (from the left navigation bar):

Select **Up-To Transaction**.

To Copy Up-To Transaction bid, select the Up To Transaction Input page.

Select the desired past date under “Search Section” from which you want to copy a transaction.

Select the desired transaction which you want to copy to a future date.

Select the desired future date under the section below “Search Section”.

Select the copy action button.

To download selected information, click the **XML** or **CSV** report buttons.

The file is downloaded to your specified local directory, or you can open it to view in a separate browser window.

20.0 Managing Load Response Portfolios

20.1 Load Response Portfolio Overview

Load Response portfolios are required for Economic and Ancillary Services market participation by Demand Response users in Markets Gateway.

Users create Load Response portfolios by selecting from a collection of locations that represent confirmed economic Load Response registrations/dispatch groups registered beforehand in DR Hub (eTools). There is no limitation to the number of portfolios created; nor is there a limit to the number of Load Response locations that can be "assigned" to a portfolio. Load Response locations may be in more than one portfolio.

NOTE: Dispatch groups will display in Markets Gateway with a prefix of 'DG_', single and aggregate registrations will display in Markets Gateway with a prefix of 'R_'.

You may want to consider the following information when defining Load Response portfolios:

- Geographic location
- Electric Distribution Company (EDC)
- Load Serving Entity (LSE) - where applicable.

20.2 Which Web Pages Do I Use?

Use the following web pages to manage Load Response portfolios:

- System Utilities – click on Portfolios Tab — to view existing Load Response portfolios and create, update and delete Load Response portfolios.

20.3 View Existing Load Response Portfolios

Load Response portfolios are required in the Portfolio filter on all Markets Gateway pages for Demand Response. Users can view existing Load Response portfolios in two ways.

First, users can view existing portfolios in the System Utilities tab:

Steps (from the left navigation bar):

Select **System Utilities**.

Select the **Portfolios** tab.

The Portfolios web page appears.

Note that three sections will display: Portfolios, Portfolio's Locations and Participant's Available Locations.

Existing portfolios are seen (if any) under the Portfolios section under the **Name** heading/section. Locations in a portfolio are seen in the Portfolio's Locations section by selecting/highlighting a portfolio.

Second, users can view existing Load Response portfolios in any of the Demand Response pages by selecting a portfolio and viewing the associated Location list:

Steps (from the left navigation bar):

Select any of the **Demand Response** pages from the navigation bar:

Select the desired portfolio from the **Portfolio** list.

The Load Response locations for the selected portfolio appear in the Location List.

Review the defined Load Response locations in the Location list for the selected portfolio.

20.4 Create New Load Response Portfolios

Enter the following data when creating a new Load Response portfolio:

- **Portfolio** – The name of a Load Response portfolio.
- **Location** – The market name of the Load Response registration used for offers. This name appears in the Location list on the Demand Response pages.

Steps (from the left navigation bar):

Select **System Utilities**.

Select the **Portfolios** tab.

The Portfolios web page appears.

Note that three columns will display: Portfolios, Portfolio's Locations and Participant's Available Locations.

User **must** right-click in the Portfolios section under the **Name** heading in order to bring up either the **Create** or the **Create/Remove** button. Select **Create**.

*The **Create Portfolio** pop-up text box displays.*

Enter the name of the new portfolio in the **Name** field.

Click **Create**.

The new portfolio name appears in the Portfolios section with red highlight.

Click on the row containing the name of the Portfolio (red highlight).

Note that there are no locations in the Portfolio's Locations section.

*Note that a location **must** be added to the Portfolio in order to **save** the newly created portfolio.*

Continue to the next set of Steps to add a location to the Portfolio.

20.5 Add Load Response Location to a Load Response Portfolio

A user can add Load Response locations to existing portfolios. There is currently no limit to the number of Load Response locations that can be assigned to a portfolio. A Load Response location can be assigned to more than one portfolio.

Steps (from the left navigation bar):

Select **System Utilities**.

Select the **Portfolios** tab.

The Portfolios web page appears.

Note that three columns will display: Portfolios, Portfolio's Locations and Participant's Available Locations.

Locate the Portfolio to which a new location is to be added.

Click on the row containing the name of the Portfolio to add locations.

Click on a row (i.e. a location) in the list of Participant's Available Locations to select the location.

*Locations are found by using the vertical scroll bar to the far right or the filter boxes at the top of the columns in the Participant's Available Locations section. Type 'Loadresponse' (and press Enter) into the **Type** filter to bring up a list of eligible Load Response locations for the portfolio.*

Locate the block of 4 single and double arrow buttons adjacent to the Location list.

Click on the left arrow button to add a location to the Portfolio.

The selected Location appears in the center set of columns containing the Portfolio's Locations.

Repeat the row selection and addition for as many Locations are to be included in the Portfolio.

Note that clicking on the double arrow will add ALL available locations to the portfolio.

Click the **Save** button to retain the Portfolio with its new Location(s).

"Success: Save successful" message is displayed.

20.6 Delete Load Response Portfolio

A user can delete an entire Load Response portfolio or a Load Response location within a portfolio. Once a portfolio is deleted, the Load Response registrations assigned to that portfolio are deleted as well.

Steps (from the left navigation bar):

Select **System Utilities**.

Select the **Portfolios** tab.

The Portfolios web page appears.

Select and highlight the portfolio's name in the Portfolios field.

Right-click and select the **Remove** button to delete the selected portfolio.

The portfolio disappears from the Portfolios list.

Click the **Save** button to delete the portfolio or click Refresh to retain the portfolio.

"Success: Save successful" message is displayed.

20.7 Delete a Load Response Location from a Load Response Portfolio

A user can remove a Load Response location from a defined Load Response portfolio.

Steps (from the left navigation bar):

Select **System Utilities**.

Select the **Portfolios** tab.

The Portfolios web page appears.

Select and click the portfolio's name in the Portfolios field.

The row will become highlighted.

Select a Load Response location by clicking it in the Portfolio's Location section.

The row will become highlighted.

Locate the block of 4 single and double arrow buttons adjacent to the Location list.

Click on the right arrow button to remove a Load Response location from the Portfolio.

Click the **Save** button to confirm the removal of location from the Portfolio.

The Save Successful message displays, the row disappears, and the Location is deleted.

21.0 Managing Load Response Energy Offers

21.1 Load Response Energy Offer Overview

Demand Response participants may submit Real-Time and/or Day-Ahead Load Response energy offers and information such as Shutdown Costs, Notification Time and Minimum Downtime in Markets Gateway.

21.2 Which Web Pages Do I Use?

The following Demand Response web pages are used to view and manage Load Response energy offers data under the **Demand Response** submenu in the navigation bar:

- **Offer Curve Manager** – Use this web page to submit/update Schedule Names, Descriptions and Types.
- **Offers** – Use this web page to submit daily Load Response offer data (MW and price segments).
- **Offer Updates** – Use this web page to submit hourly Load Response offer data (MW and price segments).
- **Parameters** – Use this web page to submit updated periodic Load Response Shutdown Costs, Minimum Downtime, Notification Time data, and, if applicable, to designate Load Response as Flexible for that operating day.
- **Schedule Selection** – Use this web page to choose Schedule Name, Market Type and Availability.
- **Hourly Updates** – Use this web page to submit updated hourly Load Response MW (economic min and max), hourly availability status, hourly Minimum Downtime, hourly Notification Time, hourly Shutdown Cost, and to note the Area Name of the applicable Reserve Zone/subzone for that location for any given operating hour.
- **Composite Offer Verification** - The calculated offer consisting of Startup costs, No Load costs, and Incremental Offers.

21.3 Create/Update/Remove a Schedule

Schedules are required to participate in the economic energy markets. Schedules are the names assigned to the Offer Curves created on the Offers Tab. Up to two schedules can be created. Edits can only be saved when Market is open. The following Demand Response web pages are used:

- **Demand Response submenu – click on Offer Curve Manager tab** - Use this web page to submit/update Schedule Names, Descriptions and Types.

Steps (from the left navigation bar):

Select **Demand Response**.

Select the **Demand Response** submenu.

Select the **Offer Curve Manager** tab.

The Demand Response Offer Curve Manager web page appears.

Click the Market Day calendar to select the date.

Select the desired portfolio from the Portfolio List.

The Load Response locations included in the portfolio appear in the Location List.

Select the desired Load Response location from the Location list.

Schedule data, if any, for the selected Load Response location appears.

If there is no Schedule data for the chosen location, then the user can right-click in the area under the headings and select **“Add Item”**.

A row with blank entries for schedule data appears.

For Load Response offers, enter or modify the following information:

- Schedule Name
- Schedule Description
- Schedule Type (1 or 2)
- User may Modify existing entries (2 schedules are allowed)

To Remove a schedule, select the row with the schedule, right-click and select **“Remove Item”**.

At the completion of any of the above tasks, Click the **Save** button.

“Success: Save successful” message is displayed.

To download selected information, click the **XML** or **CSV** report buttons.

The file is downloaded to your specified local directory, or you can open it to view in a separate browser window.

21.4 Select a Schedule

Users must select a schedule for energy offers. Users must also select Market Type which defines the Offer as either Day-Ahead, Real-Time, or Both and select which Schedule is available for Offers on that day.

Steps (from the left navigation bar):

Select **Demand Response**.

Select **Demand Response** submenu.

Select the **Schedule Selection** tab.

The Schedule Selection web page appears.

Click the Market Day calendar to select the date.

Select the desired portfolio from the Portfolio List.

The Load Response locations included in the portfolio appear in the Location List.

Select the desired Load Response location from the Location List.

The data for the selected Load Response location appears (if blank then this indicates that there is no schedule to select – please refer to previous section to create a schedule).

Enter the following data for the Load Response location:

- Market Type
 - Allows the participant to select the following Market Types:
 1. Day-Ahead (participate only in the Day-Ahead Market)
 2. Balancing (participate only in the Real-Time Market)

3. Both (considered for participation in both the Day-Ahead and Real-Time Markets)

- Availability (True or False)

Note that only one schedule **can** be available for a day, and one **must** be available in order to participate in the energy market.

Click the **Save** button.

“Success: Save successful” message is displayed.

To download selected information, click the **XML** or **CSV** report buttons.

The file is downloaded to your specified local directory, or you can open it to view in a separate browser window.

Note: Once a Schedule is selected, it will remain effective in Markets Gateway until either modified or removed.

21.5 Shutdown Costs of a Load Response Location

Shutdown costs are expressed in dollars and represent the fixed cost of reducing load associated with a Load Response location. Shutdown costs are optional for the energy market. Shutdown costs will be changeable only every six months, corresponding to the six-month periods during which price-based Startup costs may be changed for generators.

Period 1 Shutdown Cost (\$) – Shutdown costs for Period 1, expressed in dollars, represent the fixed cost of reducing load associated with a Load Response location. The six-month periods for shutdown costs are defined as follows: Period 1 is defined as April 1 - September 30.

Period 2 Shutdown Cost (\$) – Shutdown costs for Period 2, expressed in dollars, represent the fixed cost of reducing load associated with a Load Response location. The six-month periods for shutdown costs are defined as follows: Period 2 is defined as October 1 - March 31.

Steps (from the left navigation bar):

Select **Demand Response**.

Select the **Demand Response** submenu.

Select the **Parameters** tab.

The Demand Response Parameters web page appears.

Click the Market Day calendar to select the date.

Select the desired portfolio from the Portfolio List.

The Load Response locations included in the portfolio appear in the Location List.

Select the desired Load Response location from the Location list.

The data for the selected Load Response location appears.

For Load Response Offers, enter the following information:

- Period 1 Shutdown Cost (\$)
- Period 2 Shutdown Cost (\$)

Click the **Save** button.

“Success: Save successful” message is displayed.

To download selected information, click the **XML** or **CSV** report buttons.

The file is downloaded to your specified local directory, or you can open it to view in a separate browser window.

Note: Once shutdown costs are saved, they will remain effective in Markets Gateway until either modified or deleted.

21.6 Minimum Downtime of a Load Response Location

Minimum down time will be expressed as a number of hours and represents the minimum number of contiguous hours for which a Load Response offer must be committed in the energy market.

Minimum Downtime Limit — Minimum down time, expressed as a number of hours, represents the minimum number of contiguous hours for which a Load Response offer must be committed/dispatched in the energy Market. Minimum down times are optional.

Steps (from the left navigation bar):

Select **Demand Response**.

Select the **Demand Response** submenu.

Select the **Parameters** tab.

The Demand Response Parameters web page appears.

Click the Market Day calendar to select the date.

Select the desired portfolio from the Portfolio List.

The Load Response locations included in the portfolio appear in the Location List.

Select the desired Load Response location from the Location list.

The data for the selected Load Response location appears.

For Load Response Offers, enter the following information (optional):

Minimum Downtime Limit

Click the **Save** button.

“Success: Save successful” message is displayed.

To download selected information, click the **XML** or **CSV** report buttons.

The file is downloaded to your specified local directory, or you can open it to view in a separate browser window.

Note: Once minimum down time is saved, it will remain effective in Markets Gateway until either modified or deleted.

21.7 Maximum Downtime of a Load Response Location

Maximum down time will be expressed as a number of hours and represents the maximum number of continuous hours for which a Load Response offer can be committed in the energy market.

Maximum Downtime Limit — Maximum down time, expressed as a number of hours, represents the maximum number of continuous hours for which a Load Response offer can be committed/dispatched in the energy Market. Maximum down times are optional.

Steps (from the left navigation bar):

Select **Demand Response**.

Select the **Demand Response** submenu.

Select the **Parameters** tab.

The Demand Response Parameters web page appears.

Click the Market Day calendar to select the date.

Select the desired portfolio from the Portfolio List.

The Load Response locations included in the portfolio appear in the Location List.

Select the desired Load Response location from the Location list.

The data for the selected Load Response location appears.

For Load Response Offers, enter the following information (optional):

Maximum Downtime Limit

Click the **Save** button.

"Success: Save successful" message is displayed.

To download selected information, click the **XML** or **CSV** report buttons.

The file is downloaded to your specified local directory, or you can open it to view in a separate browser window.

Note: Once maximum down time is saved, it will remain effective in Markets Gateway until either modified or deleted.

21.8 Notification Time of a Load Response Location

Notification Time (Hour) - Number of hours representing the amount of advance notice required for a Load Response location to reduce load. Notification Time is optional.

Steps (from the left navigation bar):

Select **Demand Response**.

Select the **Demand Response** submenu.

Select the **Parameters** tab.

The Demand Response Parameters web page appears.

Click the Market Day calendar to select the date.

Select the desired portfolio from the Portfolio List.

The Load Response locations included in the portfolio appear in the Location List.

Select the desired Load Response location from the Location list.

The data for the selected Load Response location appears.

For Load Response Offers, enter the following information:

- Notification Time (Hour)

Click the **Save** button.

“Success: Save successful” message is displayed.

To download selected information, click the **XML** or **CSV** report buttons.

The file is downloaded to your specified local directory, or you can open it to view in a separate browser window.

Note: Once notification time is saved, it will remain in Markets Gateway until either modified or deleted.

21.9 Minimum Release Time of a Load Response Location

Minimum Release Time – The minimum number of continuous hours that must be met between a release and its next curtailment commitment. Minimum Release Time is optional.

Steps (from the left navigation bar):

Select **Demand Response**.

Select the **Demand Response** submenu.

Select the **Parameters** tab.

The Demand Response Parameters web page appears.

Click the Market Day calendar to select the date.

Select the desired portfolio from the Portfolio List.

The Load Response locations included in the portfolio appear in the Location List.

Select the desired Load Response location from the Location list.

The data for the selected Load Response location appears.

For Load Response Offers, enter the following information:

- Minimum Release Time

Click the **Save** button.

“Success: Save successful” message is displayed.

To download selected information, click the **XML** or **CSV** report buttons.

The file is downloaded to your specified local directory, or you can open it to view in a separate browser window.

Note: Once notification time is saved, it will remain in Markets Gateway until either modified or deleted.

21.10 Flexible Reserve of a Load Response location

Flexible Reserve – Indicates if the Load Response can be treated as flexible load for the purposes of reserves.

NOTE: Only Load Response locations designated as capable of being Flexible will be able to make this election.

Steps (from the left navigation bar):

Select **Demand Response**.

Select the **Demand Response** submenu.

Select the **Parameters** tab.

The Demand Response Parameters web page appears.

Click the Market Day calendar to select the date.

Select the desired portfolio from the Portfolio List.

The Load Response locations included in the portfolio appear in the Location List.

Select the desired Load Response location from the Location list.

The data for the selected Load Response location appears.

For electing the Load Response as Flexible Reserve click on the box to check it:

- ☐ Flexible Reserve

Click the **Save** button.

“Success: Save successful” message is displayed.

To download selected information, click the **XML** or **CSV** report buttons.

The file is downloaded to your specified local directory, or you can open it to view in a separate browser window.

Note: Once Flexible is saved, it will remain in Markets Gateway until either modified or deleted.

21.11 Daily Load Response Offers

In order to participate in the energy market, users **must** submit daily offers for a specific MW curtailment (in minimum increments of 0.1 MW) and price. Up to ten Price/MW segments may be entered in this section in monotonically ascending MW/Price values that define the points on the offer block/slope.

A Load Response offer consists of the following data on the Markets Gateway Demand Response submenu, on the Offers tab:

- **MW** – The MW offer for a specific curtailment must be a positive number, specified in minimum increments of 0.1 MW.
- **Price** – The price, in \$/MW, at which the load shall be curtailed. The default value is \$0.00.
- **Use Offer Slope** – Indicates whether an interpolated slope is calculated between segments in a Load Response offer curve.
 - ✓ – Indicates the offer slope is used to calculate the schedule's offer price.
 - ☐ – Indicates the slope is zero (block-based offer).

Steps (from the left navigation bar):

Select **Demand Response**.

Select **Demand Response** submenu.

Select the **Offers** tab.

Click the Market Day calendar to select the date.

Select the desired portfolio from the Portfolio List.

The Load Response locations included in the portfolio appear in the Location List.

Select the desired Load Response location from the Location List.

Select the desired Schedule from the Schedule List.

The data for the selected Load Response location appears (if any).

Users may either

Edit Price/MW segments that appear

Create segments (if none appear)

Add new segments to the existing segments (limited to 10 segments)

Indicate type of offer curve (block or slope)

Remove segments.

To Edit a segment, select the row and make desired changes.

Click the **Save** button.

“Success: Save successful” message is displayed.

To Create/Add, right-click in the Offers area and select **“Add Item”** (up to 10 segments are allowed).

Enter the following data for each segment for the Load Response location (in monotonically ascending order):

- MW

*The offered quantity should be “grossed up” for line losses. For example, if 10 MW will be reduced at the customer location and the transmission and distribution loss factor is 1.1, then the offer would be 11 MW (10 MW * 1.1)*

- Price

Click the **Save** button.

“Success: Save successful” message is displayed.

To Indicate that you want the offer slope to be used, perform the following Steps (from the left navigation bar):

Left click the Use Offer Slope field.

A ✓ appears in the Use Offer Slope check box.

To Remove a segment, select the row, right-click and select **“Remove Item”**.

Click the **Save** button.

“Success: Save successful” message is displayed.

To download selected information, click the **XML** or **CSV** report buttons.

The file is downloaded to your specified local directory, or you can open it to view in a separate browser window.

Note: Once offer data is saved, it will remain effective in Markets Gateway until either modified or removed.

21.12 Hourly Load Response Offers

Users can submit hourly offers for a specific MW curtailment (in minimum increments of 0.1 MW) and price.

Hourly offers act as an hourly override of the daily offer (default) and are optional. Users can enter up to ten Price/MW segments per hour in monotonically ascending MW/Price values that define the points on the offer block/slope. Users can edit price data on the operating day up to 65 minutes prior to the operating hour (MW values for the operating day are not editable on the operating day). An hourly Load Response offer consists of the following data on the Markets Gateway Demand Response submenu, on the Offer Updates tab:

- **MW** – The MW offer for a specific curtailment must be a positive number, specified in minimum increments of 0.1 MW.
- **Price** – The price, in \$/MW, at which the load shall be curtailed. The default value is \$0.00.

Steps (from the left navigation bar):

Select **Demand Response**.

Select **Demand Response** submenu.

Select the **Offer Updates** tab.

Click the Market Day calendar to select the date.

Select the desired portfolio from the Portfolio List.

The Load Response locations included in the portfolio appear in the Location List.

Select the desired Load Response location from the Location List.

Select the desired Schedule from the Schedule List.

Right-click on any portion of the table to open up the dropdown box and click “**Expand All**” to reveal any existing data.

The data for the selected Load Response location appears (if any).

Note that a selectable checkbox appears to the left of any row (hour) that is editable. Note that by **left clicking** on the checkbox a checkmark will appear in the box. Clicking the box again will remove the checkmark. **The checkmark is required in order to save any changes made to that hour.**

By Right-clicking:

When **no row** is highlighted, a dropdown box appears that allows the user to copy the daily defaults and pasting to certain blocks of hours. There are also options to **Expand** or **Collapse** all the segments for view.

When **a row with an hour** is highlighted, a dropdown box appears that allows the user to copy the data in the hour, or paste to the hour, or **Add** a segment to the hour (limited to 10 segments),

When **a row with a Price/MW segment** is highlighted, a dropdown box appears that allows the user to **Add** a segment or **Delete** the highlighted segment.

By Left clicking:

On any row highlights that row and automatically enters a checkmark into the checkbox associated with the hour for that row.

Users may

Edit Price/MW segments that appear (can edit Price up to 65 minutes prior to the operating hour, but cannot edit MW for any hour of the operating day on that operating day)

Add segments (limited to 10 segments per hour)

Delete segments.

Copy/Paste default values or hourly values from one hour to another or a block of hours.

To Edit a segment, select the row and make desired changes. Make sure the checkmark box for that hour has a checkmark and Click the **Save** button.

“Success: Save successful” message is displayed.

To Add a segment, Left click on any row associated with the hour to add, and then right-click and select **“Add Segment”** from the dropdown box.

On the new hourly offer updates segment line, enter values into the following fields:

- MW

*The offered quantity should be “grossed up” for line losses. For example, if 10 MW will be reduced at the customer location and the transmission and distribution loss factor is 1.1, then the offer would be 11 MW (10 MW * 1.1)*

- Price

Make sure the checkmark box for that hour has a checkmark and Click the **Save** button.

“Success: Save successful” message is displayed.

To Delete a segment, right-click on selected *segment*, then select **“Delete Segment”**.

Make sure the checkmark box for that hour has a checkmark and Click the Save button.

“Success: Save successful” message is displayed.

To Copy/Paste

Defaults: right-click and select **“Copy Defaults”**. The user may then paste those defaults to any *hour* or block of *hours* that is highlighted by right-clicking and selecting **“Paste to hour(s)”**. User will not be able to paste to a row that highlights a segment.

Hourly values: right-click on a row that highlights an hour and select **“Copy Hour”**. The user may then paste the values to any *hour* or block of *hours* that is highlighted by right-clicking and selecting **“Paste to hour(s)”**. User will not be able to paste to a row that highlights a segment.

Make sure the checkmark box for that hour has a checkmark and Click the Save button.

“Success: Save successful” message is displayed.

To download selected information, click the **XML** or **CSV** report buttons.

The file is downloaded to your specified local directory, or you can open it to view in a separate browser window.

21.13 Hourly MW Operating Limits

Users **must** submit hourly MW operating limits to participate in Energy and/or Ancillary Services markets. These hourly operating parameters are entered on the Demand Response submenu on the **Hourly Updates** tab. Note that hourly operating parameters for Real-Time offers can be modified up to 65 minutes prior to the operating hour of the same market day. The following operating parameters are entered into the Hourly Updates tab:

Economic Min – Lowest incremental MW reduction a Load Response location can achieve. User must always include non-null values (at increments of 0.1 MW) for all hours available to participate in the Energy and/or Ancillary Services market. User must use a minimum of 0.1 MW to participate in Energy market, but may use 0 MW to participate in Synch Reserve and/or Regulation market if Unavailable in Energy market (see Commit Status below)

Economic Max – Largest incremental MW reduction a Load Response location can achieve. User must always include non-null values (greater than or equal to Economic Min at increments of 0.1 MW) for all hours available to participate in the Energy and/or Ancillary Services market.

Commit Status:

- **Economic** – Indicates whether a location is available for normal economic participation in **Energy** market. Required for Energy market participation.
- **Unavailable** – Indicates the location is not available for Energy market (but may be available for Synch Reserve and/or Regulation markets ONLY).
- **Self-Scheduled** – Indicates that the location is self-scheduled, however, this option is no longer available.

Minimum Downtime – Represents the minimum number of contiguous hours for which a Load Response offer must be committed in the Energy market. Min downtime cannot be updated for committed hours.

Notification Time – Number of hours representing the amount of advance notice required for a Load Response location to reduce load.

Shutdown Cost – Represents the fixed cost associated with load reduction of a Load Response location. For committed hours, shutdown cost can decrease; for uncommitted hours, shutdown cost can increase or decrease.

Area Name – applicable Reserve Zone/subzone reported for that location for any given operating hour. This section is not editable and is for awareness only.

Steps (from the left navigation bar):

Select **Demand Response**.

Select **Demand Response** submenu.

Select the **Hourly Updates** tab.

The Hourly Updates web page appears.

Click the Market Day calendar to select the date.

Select the desired portfolio from the Portfolio List.

The Load Response locations included in the portfolio appear in the Location List.

Select the desired Load Response location from the Location List.

The data for the selected Load Response location appears (if any).

Enter the following data for each hour of each Load Response location:

- Economic Min (required)
- Economic Max (required)
- Commit Status: Unavailable or Economic (Economic required for Energy market).
- Note that Self-Scheduled is no longer an option for Load Response.

- Minimum Downtime (optional override of default parameter)
- Notification Time (optional override of default parameter)
- Shutdown Cost (optional override of default parameter)

Click the **Save** button.

“Success: Save successful” message is displayed.

To download selected information, click the **XML** or **CSV** report buttons.

The file is downloaded to your specified local directory, or you can open it to view in a separate browser window.

Note that entries into Hourly Updates are **required** for Load Response participation in Energy Market **and** the Ancillary Service Markets as well (see following sections for more information).

21.14 Composite Offer Verification

The Composite Offer Verification web page provides information on generation resources if their Composite Energy Offer is calculated to be above \$1,000/MWh for Fast-Start resources. This web page is read-only. All inputs are used to calculate the Composite Energy Offer, which is calculated at the resource's Economic Maximum value. This display shows the results of the automated validation of Startup costs and No-Load costs for Fast-Start Capable generator resources. Fast-Start Resources are generation or Economic Load Response Resources that are capable of operating with a notification time plus startup time of one hour or less and a Minimum Run Time or Minimum Down Time of one hour or less.

More information regarding the market rules for Composite Energy Offer Verification for Fast-Start Capable Resources can be found in Manual 11, Section 2. The following information is presented on the Composite Offer Verification web page in Markets Gateway:

Hour – The market hour (Hour Ending).

Location – The full name of the Load Response.

Schedule – The type of schedule on which the Load Response was submitted.

Calculated Composite Offer – The calculated offer consisting of Shutdown costs.

Shutdown Cost Valid – Indicates whether the shutdown costs of the Composite Offer passes validation.

Shutdown Cost – The shutdown cost of the Composite Offer.

Incremental Offer At Economic Maximum – The incremental energy offer component of the composite energy offer, in \$/MWh, at the economic maximum load of the Load Response.

Economic Maximum – The maximum energy available, in MW, from the load response for economic dispatch.

Minimum Downtime – The minimum number of hours the load response must be down, in real-time operations, from the time the load response is taken offline to the time the load is brought back online (as measured by PJM's State Estimator).

Notification Time – The time interval, in hours, between PJM notification and the start sequence of a load response.

Use Slope – Indicates whether or not the submitted offer has selected to use the offer slope function.

Steps (from the left navigation bar):

Select **Demand Response**.

Select **Demand Response** sub menu.

Select the **Composite Offer Verification** tab.

The Composite Offer Verification web page appears.

Click the Market Day calendar to select the date.

Select the desired portfolio from the Portfolio list.

The load response resources for the selected portfolio appear in the Location list.

Select the Load Response from the Location list.

The following information can be viewed on this web page (each column can be filtered if desired):

- Location
- Schedule
- Calculated Composite Offer
- Shutdown Cost Valid
- Shutdown Cost
- Incremental Offer At Economic Maximum
- Economic Maximum
- Minimum Downtime
- Notification Time
- Use Slope

To download selected information, click the XML or CSV report buttons.

The file is downloaded to your specified local directory, or you can open it to view in a separate browser window.

21.15 View Cleared Hourly Day-Ahead Load Response Offers

Cleared hourly Day-Ahead energy Load Response offers are presented on the Demand Response web page under the Market Results submenu. The following information is presented:

Location – the name of the Load Response location.

Hours 1 through 24 -

For each hour, the MW quantity scheduled to be curtailed by the Load Response location and the Price (in \$/MWH) at which the reduction cleared are displayed. If the location did not clear for a given hour, then the field for that hour is blank.

Steps (from the left navigation bar):

Select **Demand Response**.

Select **Market Results** submenu.

Select the **Results** tab.

The Load Response Market Results web page appears.

Click the Market Day calendar to select the date.

Select the desired portfolio from the Portfolio List.

The Load Response locations included in the portfolio appear in the Location List.

Select the desired Load Response location from the Location List (or 'All Locations' can be selected to view all locations). *The data for the selected Load Response location appears.*

Review the following information:

- Location
- Hours 1 through 24 displaying the MW and Price cleared (for the given hour).

To download selected information, click the **XML** or **CSV** report buttons.

The file is downloaded to your specified local directory, or you can open it to view in a separate browser window.

22.0 Managing Regulation Offers for Load Response Locations

22.1 Regulation Data Overview

Managing regulation offers for Load Response locations is accomplished by performing the following general Steps (from the left navigation bar):

- Entering regulation Daily Offers, Hourly Updates including MW's and prices, and Interval availability updates
- Submitting a regulation bilateral

Please note that entries must also be made into Hourly Updates tab in the Demand Response submenu (specifically Economic Min and Economic Max) in order make a regulation offer (see Section 21.11 of this User Guide for how to make entries into Hourly Updates tab).

Note that the hourly regulation MW offer is calculated as follows:

Offer MW for any hour = minimum of (Offer MW, (RegHigh-RegLow)/2), where
RegHigh = minimum of (Economic Max (from Hourly Updates), Reg Max MW),
RegLow = maximum of (Economic Min (from Hourly Updates), Reg Min MW)

Reg Min MW and Reg Max MW must not be negative.

22.2 Which Web Pages Do I Use?

The following Demand Response/Bilaterals web pages are used to view and manage regulation schedules for Load Response locations:

- **Offers** – Use this web page to create daily regulation offers and modify the status of the regulation offer.
- **Updates** – Use this web page to modify regulation offers, prices and MWs on an hourly basis.
- **Availability Updates** – Use this web page to modify regulation availability on an interval basis.
- **Regulation Bilaterals** – Use Regulation Bilaterals tab on the Bilaterals web page to facilitate a regulation bilateral transaction.

22.3 Daily Regulation Offer

A regulation Daily Offer for a Load Response location consists of the following data: capability/mileage price and cost offers, offer MW, maximum and minimum MW (optional) and availability. Regulation offer data are submitted on a location basis. Regulating offers must be submitted for all load locations that are providing regulation, including load locations that are self-scheduling regulation or providing regulation to support a bilateral transaction. Regulating offers are made by product with one row representing a set of offers for a location for each product. A regulation offer consists of the following pieces of data:

Area – A bulk electric system or combination of bulk electric systems bounded by interconnection metering and telemetry to which a common generation control scheme and reserve requirement is applied. This field cannot be edited and is for awareness only.

Offer MW – The amount of regulation MW offered for the load location. This field is required if the load location is either Available or Self-Scheduled to provide regulation. The value should not be greater than the location’s qualified (tested) MW capability.

Capability Offer Price – The capability price at which regulation is offered for the location. If a location is available for regulation and no price is entered, the price will default to \$0/MWh. Capability and Performance Price Offer must total to less than or equal to \$100/MWh. Offers may not be negative.

Mileage Offer Price – The mileage price at which regulation is offered for the location. If a location is available for regulation and no price is entered, the price will default to \$0/MWh. Capability and Mileage Price Offer must total to less than or equal to \$100/MWh. Offers may not be negative.

Capability Offer Cost – The capability cost at which regulation is offered for the location. Offers are capped at \$12/MWh and may not be negative or null. If a location is available for regulation and no cost is entered, the cost will default to \$0/MWh. See Manual 15 for Guidelines on cost offers.

Mileage Offer Cost – The mileage cost at which regulation is offered for the location. Currently not defined for Load Response thus not available for Load Response locations. This cost must either be left blank or \$0/MWh entered. See Manual 15 for Guidelines on cost offers.

Reg Min MW – Minimum MW representing the bottom of the regulating range for the location. Cannot be negative.

Reg Max MW – Maximum MW representing the top of the regulating range for the location. Cannot be negative.

Min. Offer MW – Minimum MW for assignment. When a non-null value is entered, the resource owner is declaring they must clear at least that amount or not at all. The “Min. Offer MW” must be less than or equal to the submitted Offer MW.

Availability – Available status of location.

- **Available** – Indicates if the load location is available to provide regulation.
- **Not Available** – Indicates if the load location is unavailable to provide regulation.

Self-Scheduled – Indication the location is self-scheduled for the day.

Rolling Avg Performance Score – The average performance score for the last 200 intervals. It is used to adjust the capability and mileage offer. This field cannot be edited and is for awareness only.

Steps (from the left navigation bar):

Select **Demand Response**.

Select **Regulation Market**.

Select the **Offers** tab.

The Offers web page appears.

Click the Market Day calendar to select the date.

Select the desired portfolio from the Portfolio list.

The Load Response locations for the selected portfolio appear in the Location list.

Select the location from the Location list.

The data for the selected load locations appears in the Regulation Offer’s web page.

Enter the following regulation offer data for the location by signal type:

- Offer MW (required to participate)
- Capability Offer Price (optional)
- Mileage Offer Price (optional)
- Capability Offer Cost (required, cannot be null)
- Mileage Offer Cost
- Reg Min MW (required to participate)
- Reg Max MW (required to participate)
- Min Offer MW (optional)

Select one of the following regulating statuses for each offer (in order to participate):

- Availability
- Self-Scheduled

The following values cannot be edited on the screen or are for display only:

- Area
- Rolling Avg. Performance Score

Click the **Save** button.

“Success: Save successful” message is displayed.

To download selected information, click the **XML** or **CSV** report buttons.

The file is downloaded to your specified local directory, or you can open it to view in a separate browser window.

22.4 Hourly Regulating Offer Updates

Regulation offers may be submitted for specific hours of the operating day and act as overrides of the default daily data on the Regulation Offers tab. This task is accomplished by editing the Updates tab on the Regulation Market page in Markets Gateway.

The default status of the Regulation Updates page displays “null” values in all columns.

Note: If a row on Regulation Updates page is not edited from the default status, the data on the Regulation Offers page prevails.

If the User needs to revise the Offer MW capability and/or availability to reflect hourly real-time changes, the following information on the Updates web page is entered:

Reg Min MW – Minimum MW representing the bottom of the regulating range for the location. Cannot be negative.

Reg Max MW – Maximum MW representing the top of the regulating range for the location. Cannot be negative.

Reg MW – The amount of regulation MW offered for the Load Response location for this specific hour. This value overrides the Offer MW on the Offers tab for this hour for this Load Response location. May not be increased or decreased above or below the locations qualified (tested) capability MW.

Reg. Capability Offer Price – The capability price at which regulation is offered for the location. If the location is available and offer price is entered, the value overrides the Capability Offer Price on the Offers tab for this hour for this Load Response location. If no price is entered here, the price will default to the daily offer. The Capability and Mileage Offer Price, if entered, cannot be greater than \$100/MWh. Offers may not be negative.

Reg. Capability Offer Cost – The capability cost at which regulation is offered for the location. If the location is available and offer cost is entered, the value overrides the Capability Offer Cost on the Offers tab for this hour for this Load Response location. If no cost is entered here, the cost will default to the daily offer. Offers may not be negative.

Reg. Mileage Offer Price – The mileage price at which regulation is offered for the location. If the location is available and offer price is entered, the value overrides the Mileage Offer Price on the Offers tab for this hour for this Load Response location. If no price is entered here, the price will default to the daily offer. The Capability and Mileage Offer Price, if entered, cannot be greater than \$100/MWh. Offers may not be negative.

Reg. Mileage Offer Cost – The mileage cost at which regulation is offered for the location. Currently not defined for Load Response thus not available for Load Response locations. This cost must either be left blank or \$0/MWh entered.

Reg. Min. Offer MW – Minimum MW for assignment. When a non-null value is entered, the resource owner is declaring they must clear at least that amount or not at all. The “Min. Offer MW” must be less than or equal to the submitted Offer MW.

Steps (from the left navigation bar):

Select **Demand Response**.

Select **Regulation Market**.

Select the **Updates** tab.

The Regulation Updates web page appears.

The Regulation Market Updates web page appears.

Click the Market Day calendar to select the date.

Select the desired portfolio from the Portfolio list.

The Load Response locations for the selected portfolio appear in the Location list.

Select the Load Response location from the list.

The data for the selected Load Response location appears on the Regulation Updates web page.

Select from the Hourly Values pulldown list the range of hours for which you wish to modify the operating limits.

Enter data for the following operating limits:

- Reg Min MW
- Reg Max MW
- Reg MW

- Reg Capability Offer Price
- Reg Capability Offer Cost

- Reg Mileage Offer Price
- Reg Mileage Offer Cost
- Reg Min Offer MW

Click the **Save** button.

“Success: Save successful” message is displayed.

To download selected information, click the XML or CSV report buttons.

The file is downloaded to your specified local directory, or you can open it to view in a separate browser window.

Should a unit not wish to participate in the Regulation market in any given hour on the operating day, updates must be made at least 35 minutes prior to the operating hour in the Regulation Updates screen:

- Set Offer MW to zero
- Should a resource’s Regulation operating parameters change after the Regulation Market update window closes for an operating interval, the following changes may be made through direct communication with the PJM Generation Dispatcher: Regulating capability decreases or changes to Regulation Minimum and Maximum

Request PJM Dispatch to modify assignment downward to reflect latest parameters that are verbally communicated.

22.5 Interval Regulation Availability Updates

Regulation availability may be updated for specific intervals of the operating day and act as overrides of the default daily data on the Regulation Offers tab. This task is accomplished by editing the Availability Updates tab on the Regulation Market page in Markets Gateway. This must be completed no later than 35 minutes prior to the operating interval.

The daily availability from the Offers tab is listed as read-only value at the top of the Availability updates table for reference. The default status of the Regulation Availability Updates page displays “null” values in all editable columns. There is a row for each unique half hour interval per market day.

Note: If a row/interval on Regulation Availability Updates page is not edited from the default status, the data on the Regulation Offers page prevails.

If the User needs to revise the availability to reflect real-time changes, the following information on the Availability Updates web page is entered:

Reg Availability – Interval specific resource availability. Availability status’ that can be selected are:

- Available
- Not Available
- Self Scheduled (Business Rules described in Manual 11, Section 3.7.3.)

Steps (from the left navigation bar):

Select **Demand Response**.

Select **Regulation Market**.

Select the **Availability Updates** tab.

The Availability Updates web page appears.

Click the Market Day calendar to select the date.

Select the desired portfolio from the Portfolio list.

The Load Response locations for the selected portfolio appear in the Location list.

Select the location from the Location list.

The data for the selected load locations appears in the Regulation Availability Updates web page.

Enter the following regulation offer data for the location by signal type:

- **Reg Availability**

Select one of the following regulating statuses for each interval:

- Available
- Not Available
- Self-Scheduled

Click the **Save** button.

“Success: Save successful” message is displayed.

To download selected information, click the **XML** or **CSV** report buttons.

The file is downloaded to your specified local directory, or you can open it to view in a separate browser window.

22.6 Enter a Regulation Bilateral Transaction

A bilateral transaction consists of two Steps (from the left navigation bar):

- The buyer enters the transaction information.
- The seller confirms the transaction information.

The buyer is responsible for initiating regulation bilateral transactions. The seller confirms the transaction. All data must be entered no later than 13:30 the day after the transaction begins. Please note that you will have to click through all the fields, even if there is no change to the data, to exit edit mode and successfully submit the transaction.

The buyer enters the following information on the Regulation Bilaterals web page:

Seller – Indicates the entity selling the fixed amount of regulation indicated to the buyer for the duration indicated.

MW – Indicates the amount of regulation sold for the duration of the transaction.

Start Time – Indicates the date and hour the regulation bilateral transaction begins.

Stop Time – Indicates the date and hour the regulation bilateral transaction ends.

Area – A bulk electric system or combination of bulk electric systems bounded by interconnection metering and telemetry to which a common generation control scheme and reserve requirement is applied.

The Regulation Bilaterals web page presents all existing bilateral transactions that span the selected date.

Steps (from the left navigation bar):

Select **Bilaterals**.

Select the **Regulation Bilaterals** tab.

The Regulation Bilaterals web page appears.

Click the Date drop down to select the Month and Year.

The selected date's existing regulation bilateral transactions appears.

Right click to display the **Add Item** action button.

Left click to open a regulation bilateral data entry line.

On the new regulation bilateral data entry line, enter the following:

- MW
- Start Time
- Stop Time
- Area

Select the Sellers Name from the drop down in the column labelled Seller.

The seller's name appears in the Seller field.

Click the **Save** button.

"Success: Save successful" message is displayed.

To download selected information, click the **XML** or **CSV** report buttons.

The file is downloaded to your specified local directory, or you can open it to view in a separate browser window.

22.7 Confirm a Regulation Bilateral Transaction

A bilateral transaction consists of two Steps (from the left navigation bar):

- The buyer enters the transaction information.
- The seller confirms the transaction information.

The buyer is responsible for initiating regulation bilateral transactions. The seller confirms the transaction.

The seller confirms the transaction information using the Regulation Bilaterals web page.

Steps (from the left navigation bar):

Select **Bilaterals**.

Select the **Regulation Bilaterals** tab.

The Regulation Bilaterals web page appears.

Select the transaction Month/Year in the Date dropdown.

The selected date's existing regulation bilateral transactions appears.

Click in the Confirmation field to select 'Yes' or 'No' from the dropdown.

The selected transaction is confirmed or not confirmed.

Click the **Save** button.

“Success: Save successful” message is displayed.

To download selected information, click the **XML** or **CSV** report buttons.

The file is downloaded to your specified local directory, or you can open it to view in a separate browser window.

22.8 Delete a Regulation Bilateral Transaction

Once entered and confirmed, bilateral transactions may not be changed. The transaction must be deleted and re-entered. Either participant can delete a regulation bilateral transaction. The deletion is interpreted as a change from “End Time” to the current time, unless the transaction has not started. Please note that you will have to click through all the fields, even if there is no change to the data, to exit edit mode and successfully submit the transaction.

Steps (from the left navigation bar):

Select **Bilaterals**.

Select the **Regulation Bilaterals** tab.

The Regulation Bilaterals web page appears.

Click the Date drop down to select the Month and Year.

The regulation bilateral transactions for that Month/Year display.

Select the bilateral transaction to be deleted.

Right click to display the **Remove Item** action button.

Left click on **Remove Item** to delete the bilateral data line.

Click the **Save** button.

“Success: Save successful” message is displayed.

Click the **Refresh** button.

The deleted row will no longer display.

To download selected information, click the **XML** or **CSV** report buttons.

The file is downloaded to your specified local directory, or you can open it to view in a separate browser window.

22.9 View Interval Regulation Award

A Load Response location user can view their half hourly (interval) Regulation award details for the selected day for each Load Response location in a Portfolio.

The following information is presented for each Load Response location included in the selected portfolio:

Interval – The half hour (hour ending) of the operating day selected.

Location – The name of the Load Response location.

Reg. Offer MW – The validated megawatt capability used in clearing. (After the validations performed on capability as described in Manual 11, Section 3.2.6, this value may be less than the participant submitted Offer MW.) **Self-Schedule MW** – The amount cleared for regulation that was offered as self-scheduled MW.

Reg. Awarded MW – The amount of cleared Reg. MW.

TPS Result – The result of the three pivotal supplier test. A failed test result does not prevent resource clearing.

Reg Price Offer Used – The regulation offer, determined by regulation TPS testing, used for regulation market clearing, see Manual 11, Section 3.2.4.3.

Performance Score – The actual regulation performance score based on the precision of response to regulation signal. See Manual 12, Section 4.4.6 for details. This value will be populated for all intervals even if Market Results are missing for that interval.

Steps (from the left navigation bar):

Select **Demand Response**.

Select **Market Results**.

Select the **Regulation** tab.

The Market Results Regulation web page appears.

Click the Market Day calendar to select the date.

Select the desired portfolio from the Portfolio list.

A complete list of all hours and locations appears for the Portfolio chosen.

Users may

Filter list by clicking any of the dropdown boxes and setting desired filters to control what is displayed on interface.

Review the following information for each location:

- Interval
- Location
- Reg. Offer
- Self-Schedule MW
- Reg. Awarded MW
- TPS Result
- Reg Price Offer Used
- Performance Score

To download selected information, click the **XML** or **CSV** report buttons.

The file is downloaded to your specified local directory, or you can open it to view in a separate browser window.

23.0 Managing Synchronized Reserve Offers for Load Response Locations

23.1 Synchronized Reserve Data for Load Response Locations Overview

Managing Synchronized Reserve offers for Load Response locations is accomplished by performing the following general step:

- Entering synchronized reserve Daily Offers and Hourly Updates including prices and availabilities.
- Submitting a synchronized reserve bilateral

Please note that entries must also be made into Hourly Updates tab in the Demand Response submenu in order make a synchronized reserve offer (see Section 21 of this User Guide).

23.2 Which Web Pages Do I Use?

The following Demand Response/Bilaterals web pages are used to view and manage synchronized reserve schedules for Load Response locations:

Offers – Use this web page to create Synchronized Reserve daily offers, and to modify the status of the Synchronized Reserve daily offer for Load Response locations.

Updates – Use this web page to modify Synchronized Reserve offers hourly for locations, or to modify hourly location availability, or to self-schedule locations on an hourly basis for the purposes of providing synchronized reserve.

Synchronized Reserve Bilaterals – Use the Synchronized Reserve Bilaterals tab on the Bilaterals web page to facilitate Synchronized Reserve bilateral transactions.

23.3 Submit Daily Synchronized Offer

Synchronized offers must be submitted for all Load Response locations that are providing Synchronized Reserve, including Load Response locations that are self-scheduling Synchronized Reserve or providing Synchronized Reserve to support a bilateral transaction. A synchronized offer consists of the following pieces of data:

Offer MW – The amount of Synchronized Reserve MW offered for the location. The Synchronized Reserve quantity is defined as the decrease in load achievable by the location in ten (10) minutes. This field is required if the location is either Available or Self-Scheduled to provide Synchronized Reserve.

Offer Price – Must be a positive number; required if the location is available for Synchronized Reserve. A Synchronized Reserve offer price for a demand location may not exceed the expected value of the Synchronized Reserve penalty.

Availability – Indicates if the location is available or unavailable to provide Synchronized Reserve.

Steps (from the left navigation bar):

Select **Demand Response**.

Select **Synchronized Reserve Market**.

Select the **Offers** tab.

The Synchronized Reserve Market Offers web page appears.

Click the Market Day calendar to select the date.

Select the desired portfolio from the Portfolio list.

The Load Response locations for the selected portfolio appear in the Location list.

Select the location from the Locations list.

The data for the selected Load Response locations appears on the Synchronized Reserve Offers web page.

Enter the following synchronized reserve offer data:

- Offer MW (required to participate)
- Offer Price
- Available Status

Click the **Save** button.

“Success: Save successful” message is displayed.

To download selected information, click the **XML** or **CSV** report buttons.

The file is downloaded to your specified local directory, or you can open it to view in a separate browser window.

23.4 Hourly Synchronized Reserve Offer and Availability

Synchronized Reserve offers may be submitted for specific hours of the operating day and act as overrides of the default daily data on the Synchronized Reserve Offers tab. This task is accomplished by editing the Synchronized Reserve Updates page in Markets Gateway.

The default status of the Synchronized Reserve Updates page displays “null” values in the Offer MW and Self Scheduled MW columns. “Not available” is displayed in the Available Status column.

Note: If a row on Synchronized Reserve Market Updates page is not edited from the default status, the data on the Synchronized Reserve Market Offers page prevails.

- **Offer MW** – The amount of Synchronized Reserve MW offered for the location. The Synchronized Reserve quantity is defined as the increase in output achievable by the location in ten (10) minutes. This field is required if the location is either Available or Self-Scheduled to provide Synchronized Reserve.
- **Offer Price** – Must be a positive number; required if the location is available for Synchronized Reserve. A Synchronized Reserve offer price for a demand location may not exceed the expected value of the Synchronized Reserve penalty.
- **Self Scheduled** – Indicates whether the Load Response is self-scheduled for Synchronized Reserve.
- **Availability** – Status of the location.

A synchronized offer’s status is one of the following states:

- **Available** – Indicates if the location is available to provide Synchronized Reserve.
- **Not Available** – Indicates if the location is unavailable to provide Synchronized Reserve.

Steps (from the left navigation bar):

Select **Demand Response**.

Select **Synchronized Reserve Market**.

Select the **Updates** tab.

The Synchronized Reserve Updates web page appears.

Click the Market Day calendar to select the date.

Select the desired portfolio from the Portfolio list.

The Load Response locations for the selected portfolio appear in the Location list.

Select the location from the Locations list.

The data for the selected location appears on the Synchronized Reserve Market Updates web page.

Enter the following synchronized availability data:

- Offer MW
- Offer Price
- Self Scheduled
- Availability

Click the **Save** button.

“Success: Save successful” message is displayed.

To download selected information, click the **XML** or **CSV** report buttons.

The file is downloaded to your specified local directory, or you can open it to view in a separate browser window.

Should a unit not wish to participate in the Synch Reserve market in any given hour on the operating day, both updates must be made at least 35 minutes prior to the operating hour in the Updates screen:

- Set Offer MW to zero
- Set Available status to Not Available

Should a location's Synch operating parameters change after the Synchronous Reserve market closes for an hour, the following changes may be made through direct communication with the PJM Scheduling Coordinator:

- Location Synch Status
- Available to unavailable

23.5 Enter a Synchronized Reserve Bilateral Transaction

A bilateral transaction consists of two Steps (from the left navigation bar):

- The buyer enters the transaction information.
- The seller confirms the transaction information.

The buyer is responsible for initiating synchronized reserve bilateral transactions. The seller confirms the transaction. All data must be entered no later than 1415 the day after the transaction begins.

Please note that you will have to click through all the fields, even if there is no change to the data, to exit edit mode and successfully submit the transaction.

The buyer enters the following information on the Synchronized Reserve Bilaterals web page:

Seller – Indicates the entity selling the fixed amount of synchronized reserve indicated to the buyer for the duration indicated.

MW – Indicates the amount of Synchronized Reserve sold for the duration of the transaction.

Start Date Hour – Indicates the date and hour when the Synchronized Reserve bilateral transaction begins.

Stop Date Hour – Indicates the date and hour when the Synchronized Reserve bilateral transaction ends.

Area – A bulk electric system or combination of bulk electric systems bounded by interconnection metering and telemetry to which a common generation control scheme and reserve requirement is applied.

The Synchronized Bilaterals web page presents all existing bilateral transactions that span the selected date.

Steps (from the left navigation bar):

Select **Bilaterals**.

Select the **Synchronized Reserve Bilaterals** tab.

The Synchronized Reserve Bilaterals web page appears.

Click the Date drop down to select the Month and Year.

The synchronized reserve bilateral transactions for that Month/Year display.

Right click to display the **Add Item** action button.

Left click on **Add Item** to display a new data entry line.

A new row appears on the web page.

Select the Sellers Name from the Participant Selector.

The seller's name appears in the Seller field.

Enter the following data:

- Seller
- MW

- Start Date Hour
- Stop Date Hour
- Area

Select the bilateral transactions to be submitted.

Click the **Save** button.

"Success: Save successful" message is displayed.

To download selected information, click the **XML** or **CSV** report buttons.

The file is downloaded to your specified local directory, or you can open it to view in a separate browser window.

23.6 Confirm a Synchronized Reserve Bilateral Transaction

A bilateral transaction consists of two Steps (from the left navigation bar):

- The buyer enters the transaction information.

- The seller confirms the transaction information.

The buyer is responsible for initiating synchronized reserve bilateral transactions. The seller confirms the transaction.

Please note that you will have to click through all the fields, even if there is no change to the data, to exit edit mode and successfully submit the transaction.

The seller confirms the transaction information using the Synchronized Reserve Bilaterals web page. The following information is entered into the Confirmation field: Yes or No.

Steps (from the left navigation bar):

Select **Bilaterals**.

Select the **Synchronized Reserve Bilaterals** tab.

The Synchronized Reserve Bilaterals web page appears.

Click the Date drop down to select the Month and Year.

The selected date's existing synchronized bilateral transactions appears.

Select 'Yes' or 'No' from the Confirmation field drop down.

The chosen selection is displayed in the field.

Click the **Save** button.

"Success: Save successful" message is displayed.

To download selected information, click the **XML** or **CSV** report buttons.

The file is downloaded to your specified local directory, or you can open it to view in a separate browser window.

23.7 Delete a Synchronized Reserve Bilateral Transaction

Once entered and confirmed, bilateral transactions may not be changed. The transaction must be deleted and re-entered. Either participant can delete a synchronized bilateral transaction. The deletion is interpreted as a change from "End Time" to the current time, unless the transaction has not started.

Please note that you will have to click through all the fields, even if there is no change to the data, to exit edit mode and successfully submit the transaction.

Steps (from the left navigation bar):

Select **Bilaterals**.

Select the **Synchronized Reserve Bilaterals** tab.

The Synchronized Reserve Bilaterals web page appears.

Click the Date drop down to select the Month and Year.

The selected date's existing Synchronized Reserve bilateral transactions appears.

Right click on the bilateral transaction to be deleted.

Select the **Remove Item** action button.

Click the **Save** button.

“Success: Save successful” message is displayed.

To download selected information, click the **XML** or **CSV** report buttons.

The file is downloaded to your specified local directory, or you can open it to view in a separate browser window.

23.8 View Day-Ahead or Real-Time Hourly Synchronized Reserve Award

A Load Response location user can view the Day-Ahead or Real-Time hourly Synchronized Reserve award details for the selected day for each Load Response location in a Portfolio (note: results may not be valid for Flexible resources).

The following information is presented for each Load Response location included in the selected portfolio:

Hour – The hour (hour ending) of the operating day selected.

Location – The name of the Load Response location.

Area – The zone/subzone where the Synchronized Reserve award occurred.

Offer MW – The amount of Synchronized Reserve MW offered for the location.

Self-Scheduled MW – The amount of Synchronized Reserve MW's assigned as self-scheduled.

Awarded MW – The amount of cleared Synchronized Reserve MW.

Steps (from the left navigation bar):

Select **Demand Response**.

Select **Market Results**.

Select the **DA Synchronized Reserve Award** tab or **RT Synchronized Reserve Award** tab.

The Market Results DA/RT Synchronized Reserve Award web page appears.

Click the Market Day calendar to select the date.

Select the desired portfolio from the Portfolio list.

A complete list of all hours and locations appear for the Portfolio chosen.

Users may

Filter list by clicking any of the dropdown boxes and setting desired filters to control what is displayed on interface.

Review the following information for each location:

- Hour
- Location
- Area
- Offer MW
- Self-Scheduled MW
- Awarded MW

To download selected information, click the **XML** or **CSV** report buttons.

The file is downloaded to your specified local directory, or you can open it to view in a separate browser window.

24.0 Managing Secondary Reserve Offers for Load Response Locations

24.1 Secondary Reserve Data for Load Response Locations Overview

Managing Secondary Reserve offers for Load Response locations is accomplished by performing the following general step:

- Entering secondary reserve Daily Offers and Hourly Updates including prices and availabilities.
- Submitting a secondary reserve bilateral

Please note that entries must also be made into Hourly Updates tab in the Demand Response submenu in order to make a secondary reserve offer (see Section 21.11 of this User Guide).

24.2 Which Web Pages Do I Use?

The following Demand Response/Bilaterals web pages are used to view and manage secondary reserve schedules for Load Response locations:

Offers – Use this web page to create Secondary Reserve daily offers for locations, and to modify the status of the Secondary Reserve daily offer for Load Response locations.

Updates – Use this web page to modify Secondary Reserve offers for locations, and location availability on an hourly basis.

Secondary Reserve Bilaterals – Use the Secondary Reserve Bilaterals on the Bilaterals web page to facilitate Secondary Reserve bilateral transactions.

24.3 Submit Daily Secondary Offer

Secondary Reserve offers must be submitted for all Load Response locations that are providing Secondary Reserve, including Load Response locations that are providing Secondary Reserve to support a bilateral transaction. A secondary offer consists of the following pieces of data:

Offer MW – The amount of Secondary Reserve MW offered for the location. The Secondary Reserve quantity is defined as the decrease in load achievable by the location in thirty (30) minutes. This field is required if the location is Available to provide Secondary Reserve.

Availability – Indicates if the location is available or unavailable to provide Secondary Reserves.

Steps (from the left navigation bar):

Select **Demand Response**.

Select **Secondary Reserve Market**.

Select the **Offers** tab.

The Secondary Reserve Market Offers web page appears.

Click the Market Day calendar to select the date.

Select the desired portfolio from the Portfolio list.

The Load Response locations for the selected portfolio appear in the Location list.

Select the location from the Locations list.

The data for the selected Load Response locations appears on the Secondary Reserve Offers web page.

Enter the following secondary reserve offer data:

- Offer MW (required to participate)
- Availability

Click the **Save** button.

“Success: Save successful” message is displayed.

To download selected information, click the **XML** or **CSV** report buttons.

The file is downloaded to your specified local directory, or you can open it to view in a separate browser window.

24.4 Hourly Secondary Reserve Offer and Availability

Secondary Reserve offers may be submitted for specific hours of the operating day and act as overrides of the default daily data on the Secondary Reserve Offers tab. This task is accomplished by editing the Secondary Reserve Updates page in Markets Gateway.

The default status of the Secondary Reserve Updates page displays “null” values in the Offer MW column. “Not available” is displayed in the Available Status column.

Note: If a row on Secondary Reserve Market Updates page is not edited from the default status, the data on the Secondary Reserve Market Offers page prevails.

- **Offer MW** – The amount of Secondary Reserve MW offered for the location. The Secondary Reserve quantity is defined as the increase in output achievable by the location in thirty (30) minutes. This field is required if the location is Available to provide Secondary Reserve.
- **Availability** – Status of the location.

A secondary offer’s status is one of the following states:

- **Available** – Indicates if the location is available to provide Secondary Reserve.
- **Not Available** – Indicates if the location is unavailable to provide Secondary Reserve.

Steps (from the left navigation bar):

Select **Demand Response**.

Select **Secondary Reserve Market**.

Select the **Updates** tab.

The Secondary Reserve Updates web page appears.

Click the Market Day calendar to select the date.

Select the desired portfolio from the Portfolio list.

The Load Response locations for the selected portfolio appear in the Location list.

Select the location from the Locations list.

The data for the selected location appears on the Secondary Reserve Market Updates web page.

Enter the following secondary availability data:

- Offer MW
- Availability

Click the **Save** button.

“Success: Save successful” message is displayed.

To download selected information, click the **XML** or **CSV** report buttons.

The file is downloaded to your specified local directory, or you can open it to view in a separate browser window.

Should a unit not wish to participate in the Secondary Reserves market in any given hour on the operating day, both updates must be made at least 35 minutes prior to the operating hour in the Updates screen:

- Set Offer MW to zero
- Set Available status to Not Available

24.5 Enter a Secondary Reserve Bilateral Transaction

A bilateral transaction consists of two Steps (from the left navigation bar):

- The buyer enters the transaction information.
- The seller confirms the transaction information.

The buyer is responsible for initiating secondary reserve bilateral transactions. The seller confirms the transaction. All data must be entered no later than 14:15 the day after the transaction begins.

Please note that you will have to click through all the fields, even if there is no change to the data, to exit edit mode and successfully submit the transaction.

The buyer enters the following information on the Secondary Reserve Bilaterals web page:

Seller – Indicates the entity selling the fixed amount of secondary reserve indicated to the buyer for the duration indicated.

MW – Indicates the amount of Secondary Reserve sold for the duration of the transaction.

Start Date Hour – Indicates the date and hour when the Secondary Reserve bilateral transaction begins.

Stop Date Hour – Indicates the date and hour when the Secondary Reserve bilateral transaction ends.

Area – A bulk electric system or combination of bulk electric systems bounded by interconnection metering and telemetry to which a common generation control scheme and reserve requirement is applied. The Secondary Bilaterals web page presents all existing bilateral transactions that span the selected date.

Steps (from the left navigation bar):

Select **Bilaterals**.

Select the **Secondary Reserve Bilaterals** tab.

The Secondary Reserve Bilaterals web page appears.

Click the Date drop down to select the Month and Year.

The secondary reserve bilateral transactions for that Month/Year display.

Right click to display the **Add Item** action button.

Left click on **Add Item** to display a new data entry line.

A new row appears on the web page.

Select the Sellers Name from the Participant Selector.

The seller's name appears in the Seller field.

Enter the following data:

- Seller
- MW
- Start Date Hour
- Stop Date Hour
- Area

Select the bilateral transactions to be submitted.

Click the **Save** button.

"Success: Save successful" message is displayed.

To download selected information, click the **XML** or **CSV** report buttons.

The file is downloaded to your specified local directory, or you can open it to view in a separate browser window.

24.6 Confirm a Secondary Reserve Bilateral Transaction

A bilateral transaction consists of two Steps (from the left navigation bar):

- The buyer enters the transaction information.
- The seller confirms the transaction information.

The buyer is responsible for initiating secondary reserve bilateral transactions. The seller confirms the transaction.

Please note that you will have to click through all the fields, even if there is no change to the data, to exit edit mode and successfully submit the transaction.

The seller confirms the transaction information using the Secondary Reserve Bilaterals web page. The following information is entered into the Confirmation field: Yes or No.

Steps (from the left navigation bar):

Select **Bilaterals**.

Select the **Secondary Reserve Bilaterals** tab.

The Secondary Reserve Bilaterals web page appears.

Click the Date drop down to select the Month and Year.

The selected date's existing secondary bilateral transactions appears.

Select 'Yes' or 'No' from the Confirmation field drop down.

The chosen selection is displayed in the field.

Click the **Save** button.

"Success: Save successful" message is displayed.

To download selected information, click the **XML** or **CSV** report buttons.

The file is downloaded to your specified local directory, or you can open it to view in a separate browser window.

24.7 Delete a Secondary Reserve Bilateral Transaction

Once entered and confirmed, bilateral transactions may not be changed. The transaction must be deleted and re-entered. Either participant can delete a secondary bilateral transaction. The deletion is interpreted as a change from "End Time" to the current time, unless the transaction has not started.

Please note that you will have to click through all the fields, even if there is no change to the data, to exit edit mode and successfully submit the transaction.

Steps (from the left navigation bar):

Select **Bilaterals**.

Select the **Secondary Reserve Bilaterals** tab.

The Secondary Reserve Bilaterals web page appears.

Click the Date drop down to select the Month and Year.

The selected date's existing Secondary Reserve bilateral transactions appears.

Right click on the bilateral transaction to be deleted.

Select the **Remove Item** action button.

Click the **Save** button.

"Success: Save successful" message is displayed.

To download selected information, click the **XML** or **CSV** report buttons.

The file is downloaded to your specified local directory, or you can open it to view in a separate browser window.

24.8 View Day-Ahead or Real-Time Hourly Secondary Reserve Award

A Load Response location user can view the Day-Ahead or Real-Time Secondary Reserve hourly award details for the selected day for each Load Response location in a Portfolio (note: results may not be valid for Flexible resources).

The following information is presented for each Load Response location included in the selected portfolio:

Hour – The hour (hour ending) of the operating day selected.

Location – The name of the Load Response location.

Area – The zone/subzone where the Secondary Reserve award occurred.

Offer MW – The amount of Secondary Reserve MW offered for the location.

Awarded MW – The amount of cleared Secondary Reserve MW.

Steps (from the left navigation bar):

Select **Demand Response**.

Select **Market Results**.

Select the **DA Secondary Reserve Award** tab or **RT Secondary Reserve Award** tab.

The Market Results DA/RT Secondary Reserve Award web page appears.

Click the Market Day calendar to select the date.

Select the desired portfolio from the Portfolio list.

A complete list of all hours and locations appear for the Portfolio chosen.

Users may

Filter list by clicking any of the dropdown boxes and setting desired filters to control what is displayed on interface.

Review the following information for each location:

- Hour
- Location
- Area
- Offer MW
- Awarded MW

To download selected information, click the **XML** or **CSV** report buttons.

The file is downloaded to your specified local directory, or you can open it to view in a separate browser window.

25.0 Managing Pseudo-Tie Transactions

25.1 Pseudo-Tie Transaction Bids Overview

Pseudo-Tie Transaction bids are used in the Day-Ahead Energy market to hedge the exposure to price differentials from the source to the sink of the physical energy deliveries from PJM into MISO. They are cleared based on the total LMP price difference between the source and the sink.

Pseudo-Tie Transaction bids may only be submitted by Market Participants whose generator within the PJM balancing authority Pseudo-Ties into the MISO balancing authority. The eligible source of a Pseudo-Tie transaction is the generator location, and the eligible sink is the MISO Interface. The Market Participant may submit Pseudo-Tie Transaction MWs at each eligible location up to their transmission service reservation. Pseudo-Tie Transactions are supported in the Day-Ahead Market only.

25.2 Which Web Pages Do I Use?

The following web pages are used to view and manage Pseudo-Tie Transaction bids:

Pseudo-Tie Transaction Input – Use this web page to submit Pseudo-Tie Transaction bids.

Pseudo-Tie Transaction Results – Use this web page to view cleared Pseudo-Tie Transaction bids.

25.3 Submit Pseudo-Tie Transaction Bids

A valid Pseudo-Tie Transaction bid consists of the following data being entered on the Pseudo-Tie Transactions input web page:

Path – a pre-determined source and sink pairing based on eligible source-sink pnodes per eligible Market participant. The eligible source of a Pseudo-Tie Transaction is the generator location, and the eligible sink is the MISO Interface.

ID – The Pseudo-Tie Transaction segment ID. The default value is 1.

MW – The Pseudo-Tie Transaction Bid in MW. The default value is 0 MW.

Price – The Pseudo-Tie Transaction Bid price. The default value is \$0.00. The minimum price is -\$50.00/MWh and the maximum price is \$50.00/MWh (the price cannot be less than -50 or greater than 50).

Steps (from the left navigation bar):

Select **Pseudo Tie Transaction**.

Select the **Input** tab.

The Pseudo-Tie Transaction web page appears.

Click the Market Day calendar to select the date.

Right-Click on a selected hour and click **Add Segment**.

Select the desired path from the path dropdown list.

The eligible source of a Pseudo-Tie transaction is the generator location, and the eligible sink is the MISO Interface. The source/sink pairing would be pre-determined based on eligible market participants.

Add segment(s) to desired hours.

Use **Copy Hours 1-24** to apply inputs to all 24 hours. Use **Copy Hourly Block** to apply input to any desired hour.

Enter the following data:

- ID
- MW
- Price

Click the **Save** button.

To download selected information, click the **XML** or **CSV** report buttons.

The file is downloaded to your specified local directory, or you can open it to view in a separate browser window.

25.4 View Cleared Pseudo-Tie Transaction Bids

Cleared Pseudo-Tie Transaction results are presented in Pseudo-Tie Transaction Results webpage. The following information is presented:

Hour – Hours for which Pseudo-Tie Transactions are put in by Market Participants.

Cleared MW – The hourly total Cleared MWs for the corresponding Pseudo-Tie Transaction bid as selected from the Path List.

Source LMP – Source LMP of the selected Pseudo-Tie transaction bid.

Sink LMP – Sink LMP of the selected Pseudo-Tie transaction bid.

Steps (from the left navigation bar):

Select the **Pseudo-Tie Transaction** page.

Select the **Results** tab.

Select the pseudo-tie transaction for which you want to see the results from the path list.

Review the following information for the selected pseudo-tie transaction bid:

- Hour
- Cleared MW
- Source LMP
- Sink LMP

To download selected information, click the **XML** or **CSV** report buttons.

The file is downloaded to your specified local directory, or you can open it to view in a separate browser window.

25.5 Copy Pseudo-Tie Transaction Bids

A demand user can copy pseudo-tie transaction bids from an existing day to a future day:

Steps (from the left navigation bar):

Select the **Pseudo-Tie Transaction** page.

To Copy Pseudo-Tie Transaction bid, select the Pseudo-Tie Transaction Input page.

Select the desired past date from which you want to copy a transaction.

Select the desired path for which you want to copy to a future date.

Right-click to display the **Copy Hours 1-24** action button.

Select **Copy Hours 1-24** action button.

Select the desired future date for which you want to paste a transaction.

Select the desired path for which you want to paste a past date.

Right-click to display **Paste Hours 1-24** action button.

Select **Paste Hours 1-24** action button.

Click the **Save** button.

To download selected information, click the **XML** or **CSV** report buttons.

The file is downloaded to your specified local directory, or you can open it to view in a separate browser window.

26.0 Managing Transaction Thresholds

26.1 An Overview of Administrator Functions

Each Operating Company can assign one user the ability to set threshold settings for fixed demand bids, increment offers and decrement bids. Threshold settings are MW limits that are set to limit all user entries below the limit set.

26.2 Which Web Pages Do I Use?

The following web pages are used to set threshold settings:

- **Threshold Settings** – Use this web page to set thresholds for fixed demand bids, price-sensitive demand bids, increment offers and decrement bids.

26.3 Set Threshold Limits for Virtual Transactions

A registered Markets Gateway administrator can set threshold settings for virtual transactions for each Operating Company. The following information on the Threshold Settings web page is entered:

- **Inc Offer MW Threshold** – The MW quantity set as a threshold for all Increment Offers. The default value is Null.
- **Dec Bid MW Threshold** – The MW quantity set as a threshold for all Decrement Bids. The default value is Null.

Steps (from the left navigation bar):

Select **System Utilities**.

Select the **Threshold Settings** tab.

The Threshold Settings web page appears.

Update the following information:

- Inc Offer MW Threshold
- Dec Bid MW Threshold

Click the **Save** button.

“Success: Save successful” message is displayed.

To download selected information, click the **XML** or **CSV** report buttons.

The file is downloaded to your specified local directory, or you can open it to view in a separate browser window.

26.4 Set Threshold Limits for Fixed Demand and Price Sensitive Demand Bids

A registered Markets Gateway administrator can set threshold settings for fixed demand bids and price sensitive demand bids for each Operating Company. The following information on the Threshold Settings web page is entered:

- **Fixed MW Threshold** – The MW quantity set as a threshold for Demand Bids at each price node.
- **Price-Sensitive MW Threshold** – The MW quantity set as a threshold for Price Sensitive Demand Bids at each price node.

Steps (from the left navigation bar):

Select **System Utilities**.

Select the **Threshold Settings** tab.

The Threshold Settings web page appears.

For each Location, update the following information:

- Fixed MW Threshold
- Price Sensitive MW Threshold

Click the **Save** button.

“Success: Save successful” message is displayed.

To download selected information, click the **XML** or **CSV** report buttons.

The file is downloaded to your specified local directory, or you can open it to view in a separate browser window.

27.0 Managing Energy Storage Resources

27.1 Unit Generator Data Overview

Energy Storage resource data is defined on a unit-basis, as well as a schedule basis. Data defined on a unit basis includes unit ownership information, operating limits, ramp rates, CT weather curve data, availability status and Startup and No-Load prices for priced-based units. Regulation limits are also defined on a unit basis.

27.2 Which Web Pages Do I Use for Unit-Level?

The following web page is used to view and manage unit-level information:

Unit Detail – Use this web page to view unit ownership information and modify unit operating limits and ramp rates.

Intraday Opt Out – Use this web page to opt out of the hourly updates functionality on a monthly basis.

27.3 View Unit-specific Ownership Information

PJM requires that the Operating Company submit to PJM unit-specific information about an Energy Storage resource. This information is used to create the initial generating unit record in the Markets Database. This information is submitted in writing to PJM prior to the Operating Company submitting offers (For more information on the data that is required, see **PJM Manual 11: Energy & Ancillary Services Market Operations and the Markets Database Dictionary**).

Upon receipt of information, PJM creates the necessary records in the Markets Database. Some of this information is included on the Unit Detail web page but cannot be modified. The following unit-specific information is presented:

Type of Unit – The long name of the type of unit.

Unit Number – The energy storage resource's identifier at a site or plant.

Operating Company – The full name of the Market Participant that is responsible for operating the Energy Storage resource.

Plant Name – The full name of the plant. A plant is a group of generating units located at the same site.

Unit Name – The abbreviated name of the Energy Storage resource.

Node – A valid PJM price node, or bus, for which PJM calculates Day-Ahead and Real-Time LMPs. PJM and the EDC assign the price node for each generating unit based on the unit's telemetry and on the PJM state estimator model.

Capacity Resource – Indicates if the Energy Storage resource is a Capacity resource.

Regulation Resource – Indicates if the Energy Storage resource is a regulation resource as certified by PJM.

Steps (from the left navigation bar):

Select **Generator**.

Select **Unit**.

Select the **Detail** tab.

The Unit Detail web page appears.

Click the Market Day calendar to select the date.

Select the desired portfolio from the Portfolios list.

The list of Energy Storage resources for the selected portfolio appears in the Units List.

Select the desired location from the Location list.

The unit data for the selected unit appears on the Unit Detail page.

Review the following unit-specific ownership information:

- Type of Unit
- Unit Number
- Operating Company
- Plant Name
- Unit Name
- Node
- Capacity Resource
- Regulation Resource
- Fast Start
- Energy Storage

To download selected information, click the **XML** or **CSV** report buttons.

The file is downloaded to your specified local directory, or you can open it to view in a separate browser window.

27.4 View & Modify Unit MW Limits

MW operating limits must be specified at the unit level, but can be overridden at a schedule level and on an hourly basis. The hierarchy of MW operating limits is:

- An energy storage resource's default unit MW limits are superseded by the unit's schedule MW operating limits.
- Unit hourly overrides to operating limits supersede all other operating limits.

The following daily limits are required at an energy storage resource level and can be modified using the Unit Detail web page:

Discharge Emergency Min (MW) – Within Discharge mode the Discharge Emergency Minimum is the lowest level of power, in MW, the ESR can produce and maintain a stable level of operation. The Operating Company operates the unit (in discharge mode) at this level during a PJM declared Minimum Generation Emergency.

Discharge Economic Min (MW) – Within Discharge mode the Discharge Economic Minimum is the minimum power available for discharge, in MW, from the ESR for economic dispatch.

Discharge Economic Max (MW) – Within Discharge mode and Continuous mode, the Discharge Economic Max MW is the maximum power available for discharge, in MW, from the ESR for economic dispatch.

Discharge Emergency Max (MW) – Within Discharge and Continuous mode, the Discharge Emergency Max is the highest short-term MW level an ESR can produce and may require extraordinary procedures to produce the desired output.

Charge Emergency Min (MW) – Within Charge mode the Charge Emergency Min is the lowest short-term MW charge level an ESR can take in and may require extraordinary procedures to produce the desired intake.

Charge Economic Min (MW) – Within Charge mode the Charge Economic Min MW is the smallest magnitude of charging power available, in MW, from the ESR for economic dispatch.

Charge Economic Max (MW) – Within Charge and Continuous mode, the Charge Economic Max is the greatest magnitude of charging power available, in MW, from the ESR for economic dispatch.

Charge Emergency Max (MW) – Within Charge mode and Continuous mode, the Charge Emergency Max is the greatest magnitude of power, in MW, the ESR can pull from the grid and maintain a stable level of operation. The Operating Company operates the unit (in charge mode) at this level during a PJM declared Minimum Generation Emergency.

Discharge Synch Max (MW) – The maximum value, in MW, of output a resource (in Discharge or Continuous mode) can achieve in response to a synchronized reserve event. This quantity is defined as the increase in discharge output achievable by the unit in ten (10) minutes. This is the default Discharge Synch Maximum Limit. The default value is 0.0 MW. *Submitted values must be equal to submitted Discharge Economic Maximum unless an exception is requested/approved. See Manual 11, Section 4.2.2.1 for more information.*

Charge Synch Max (MW) – The maximum value, in MW, of output a resource (in Charge mode) can achieve in response to a synchronized reserve event. This quantity is defined as the decrease in charge output achievable by the unit in ten (10) minutes. This is the default Charge Synch Maximum Limit. The default value is 0.0 MW. *Submitted values must be equal to submitted Charge Economic Maximum unless an exception is requested/approved. See Manual 11, Section 4.2.2.1 for more information.*

Discharge Secondary Max (MW) – The maximum value, in MW, of output a resource (in Discharge or Continuous mode) can achieve in response to a secondary reserve event. This quantity is defined as the increase in discharge output achievable by the unit in ten (10) minutes. This is the default Discharge Secondary Maximum Limit. The default value is 0.0 MW. *Submitted values must be equal to submitted Discharge Economic Maximum unless an exception is requested/approved. See Manual 11, Section 4.2.2.1 for more information.*

Charge Secondary Max (MW) – The maximum value, in MW, of output a resource (in Charge mode) can achieve in response to a secondary reserve event. This quantity is defined as the decrease in charge output achievable by the unit in ten (10) minutes. This is the default Charge Secondary Maximum Limit. The default value is 0.0 MW. *Submitted values must be equal to submitted Charge Economic Maximum unless an exception is requested/approved. See Manual 11, Section 4.2.2.1 for more information.*

State of Charge Min (MWh) – The minimum State of Charge, in MWh, that should be maintained.

State of Charge Max (MWh) – The maximum State of Charge, in MWh, that should not be exceeded.

Ramp Rate (MW/Min.) – The default energy ramp rate, in MW/minute, for increasing or decreasing a unit's output. This default rate is used by PJM in the Day-Ahead commitment process. The default value is 1.0 MW/minute.

Steps (from the left navigation bar):

Select **Generator**.

Select **Unit**.

Select the **Detail** tab.

The Unit Detail web page appears.

Click the Market Day calendar to select the date.

Select the desired portfolio from the Portfolios list.

The list of generating units for the selected portfolio appears in the Location List.

Select the desired location from the Location list.

The unit data for the selected unit appears on the Unit Detail page.

Review the following unit-specific information:

- Discharge Emergency Min (MW)
- Discharge Emergency Max (MW)
- Discharge Economic Min (MW)
- Discharge Economic Max (MW)
- Charge Emergency Min (MW)
- Charge Emergency Max (MW)
- Charge Economic Min (MW)
- Charge Economic Max (MW)
- Discharge Synch Max (MW)
- Charge Synch Max (MW)
- Discharge Secondary Max (MW)
- Charge Secondary Max (MW)
- State of Charge Min (MW)
- State of Charge Max (MW)
- Ramp Rate (MW/Min.)

Select the value you wish to update.

An entry box will appear.

Update the limits by entering the new value.

Click the **Save** button.

"Success: Save successful" message is displayed.

To download selected information, click the **XML** or **CSV** report buttons.

The file is downloaded to your specified local directory, or you can open it to view in a separate browser window.

27.5 Define ESR Updates

This section is optional. Data submitted on this Markets Gateway page will not impact any calculations in the PJM pricing engines as the information will be used only for PJM research purposes.

The following information is entered on the ESR Updates web page:

- **State of Charge (MW)** – The hourly state of charge, in MW, of an energy storage resource. These values are managed by the participant and must be manually entered to reflect the state of charge for an ESR. This data is optional and will only be used for PJM research purposes.

Steps (from the left navigation bar):

Select **Generator**.

Select **Unit**.

Select the **ESR Updates** tab.

The ESR Updates web page appears.

Click the Market Day calendar to select the date.

Select the desired portfolio from the Portfolio list.

The list of Energy Storage resources for the selected portfolio appears in the Location list.

Select the desired unit from the Location list.

The State of Charge (MW) data for the selected unit appears on the web page.

Enter the following data:

- State of Charge (MW)

Click the **Save** button.

“Success: Save successful” message is displayed.

To download selected information, click the **XML** or **CSV** report buttons.

The file is downloaded to your specified local directory, or you can open it to view in a separate browser window.

27.6 Managing Hourly Unit Data

The Operating Company can reflect real-time changes to the MW limits and status of the unit by using the Unit Hourly Updates web page. Changes made to the unit data using the Unit Hourly Updates web page supersede all schedule data (Schedule Detail web page), weather curve data (Unit Detail web page) and unit limits (Unit Detail web page). All hourly updates can be made up to the end of the current operating hour.

27.7 Which Web Pages Do I Use for Hourly-Level?

The Operating Company uses the following web pages to submit hourly updates to PJM:

- **Generator->Unit->Hourly Updates** – Use this page to submit updated unit statuses and MW operating limits for Energy Storage resources.
- **Generator->Regulation Market->Updates** – Use this page to submit updated regulation offers and regulation limits for Energy Storage resources per operating hour.

- **Generator->Regulation Market-> Availability Updates** – Use this page to submit updated regulation availability for Energy Storage resources per operating interval.
- **Generator->Synchronized Reserve Market->Updates** – Use this page to submit updated Synchronized Reserve offers, or to alter the availability, or to self-schedule on an hourly basis for Energy Storage resources.
- **Generator->Non-Synchronized Reserve Market->Updates** – Use this page to submit updated Non-Synchronized Reserve offers, or to alter the availability on an hourly basis for Energy Storage resources.
- **Generator->Secondary Reserve Market->Updates** - Use this page to submit updated Secondary Reserve offers, or to alter the availability on an hourly basis for Energy Storage resources.

27.8 Submit Revised MW Operating Limits

If the Operating Company needs to revise the MW operating limits to reflect real-time changes, the following information on the Unit Hourly Updates web page is entered:

Hour – A trading interval of one hour, identified by the time at the end of that hour.

Discharge Emergency Min (MW) – Within Discharge mode the Discharge Emergency Minimum is the lowest level of power, in MW, the ESR can produce and maintain a stable level of operation. The Operating Company operates the unit (in discharge mode) at this level during a PJM declared Minimum Generation Emergency.

Discharge Economic Min (MW) – Within Discharge mode the Discharge Economic Minimum is the minimum power available for discharge, in MW, from the ESR for economic dispatch.

Discharge Economic Max (MW) – Within Discharge mode and Continuous mode, the Discharge Economic Max MW is the maximum power available for discharge, in MW, from the ESR for economic dispatch.

Discharge Emergency Max (MW) – Within Discharge and Continuous mode, the Discharge Emergency Max is the highest short-term MW level an ESR can produce and may require extraordinary procedures to produce the desired output.

Charge Emergency Min (MW) – Within Charge mode the Charge Emergency Min is the lowest short-term MW charge level an ESR can take in and may require extraordinary procedures to produce the desired intake.

Charge Economic Min (MW) – Within Charge mode the Charge Economic Min MW is the smallest magnitude of charging power available, in MW, from the ESR for economic dispatch.

Charge Economic Max (MW) – Within Charge and Continuous mode, the Charge Economic Max is the greatest magnitude of charging power available, in MW, from the ESR for economic dispatch.

Charge Emergency Max (MW) – Within Charge mode and Continuous mode, the Charge Emergency Max is the greatest magnitude of power, in MW, the ESR can pull from the grid and maintain a stable level of operation. The Operating Company operates the unit (in charge mode) at this level during a PJM declared Minimum Generation Emergency.

***Discharge Synch Max (MW)** – The maximum value, in MW, of output a resource (in Discharge or Continuous mode) can achieve in response to a synchronized reserve event. This quantity is defined as the increase in discharge output achievable by the unit in ten (10) minutes. **This field is hidden by default unless the resource owner has requested and been approved for an exception to submit these values less than Economic Maximum. See Manual 11, Section 4.2.2.1 for more information.*

***Charge Synch Max (MW)** – The maximum value, in MW, of output a resource (in Charge mode) can achieve in response to a synchronized reserve event. This quantity is defined as the decrease in charge output achievable by the

unit in ten (10) minutes. **This field is hidden by default unless the resource owner has requested and been approved for an exception to submit these values less than Economic Maximum. See Manual 11, Section 4.2.2.1 for more information.*

***Discharge Secondary Max (MW)** – The maximum value, in MW, of output a resource (in Discharge or Continuous mode) can achieve in response to a secondary reserve event. This quantity is defined as the increase in discharge output achievable by the unit in ten (10) minutes. **This field is hidden by default unless the resource owner has requested and been approved for an exception to submit these values less than Economic Maximum. See Manual 11, Section 4.2.2.1 for more information.*

***Charge Secondary Max (MW)** – The maximum value, in MW, of output a resource (in Charge mode) can achieve in response to a secondary reserve event. This quantity is defined as the decrease in charge output achievable by the unit in ten (10) minutes. **This field is hidden by default unless the resource owner has requested and been approved for an exception to submit these values less than Economic Maximum. See Manual 11, Section 4.2.2.1 for more information.*

Steps (from the left navigation bar):

Select **Generator**.

Select **Unit**.

Select the **Hourly Updates** tab.

The Hourly Updates web page appears.

Select the current Operating Day.

Select the desired portfolio from the Portfolio list.

The Energy Storage resources for the selected portfolio appear in the Location list.

Select the desired unit from the Location list.

The data for the selected energy storage resource appears on the Hourly Updates web page.

Enter data for the following operating limits for the specific hours for which to modify the operating limits:

- Discharge Emergency Min. MW
- Discharge Economic Min. MW
- Discharge Economic Max. MW
- Discharge Emergency Max. MW
- Discharge Synch Max. MW
- Discharge Secondary Max. MW
- Charge Emergency Min. MW
- Charge Economic Min. MW
- Charge Economic Max. MW
- Charge Emergency Max. MW
- Charge Synch Max. MW
- Charge Secondary Max. MW

Click the **Save** button.

“Success: Save successful” message is displayed.

To download selected information, click the **XML** or **CSV** report buttons.

The file is downloaded to your specified local directory, or you can open it to view in a separate browser window.

27.9 Revise the Status of an Energy Storage Resource

During the Operating Day, the Operating Company can revise the status of the Energy Storage resource. The following unit status information is presented on the Unit Hourly Updates web page:

Available choices for Commit Status:

- **Charge** – Indicates whether a unit is receiving electric energy from the grid. MW would be negative on the offer curve.
- **Discharge** – Indicates whether a unit is injecting energy onto to the grid. MW would be positive on the offer curve.
- **Continuous** – Indicates that the unit is either receiving electric energy from the grid or injecting electric energy onto the grid. Units in continuous mode would follow PJM dispatch based on the operating range supported by the offer curve and would have an infinite ramp rate.
- **Unavailable** – Indicates whether the unit is available.

Only one of the above statuses may be selected for a unit in a given hour.

Fixed Gen – This field should be set to yes if an Energy Storage resource intends to remain “fixed” or otherwise not follow PJM real-time dispatch. This flag will be fed into the PJM Unit Dispatch System and will tell the system that the unit will not be responding to PJM dispatch signals. This information is needed to maintain an accurate overall dispatch solution as possible, and PJM encourages all energy storage resources not intending to follow dispatch to check this field. The fixed gen field is not used at all in the PJM settlement calculations and therefore will have no direct effect on operating reserve eligibility. The field is not used by the Day-Ahead market.

Ancillary Only – This designation is for Energy Storage resources that do not want to participate in the real time energy market but want to provide Regulation or Reserves.

Steps (from the left navigation bar):

Select **Generator**.

Select **Unit**.

Select the **Hourly Updates** tab.

The Unit Hourly Updates web page appears.

Select the current Operating Day.

Select the desired portfolio from the Portfolio list.

The Energy Storage resources for the selected portfolio appear in the Location list.

Select the generating from the Location list.

The data for the selected generating unit appears on the Hourly Updates web page.

Enter data for the specific hours for which to modify the unit status:

Select one of the following statuses:

- Charge
- Discharge
- Continuous
- Unavailable

Modify the following fields for the specific hours selected:

- Fixed Gen
- Ancillary Only

Click the **Save** button.

“Success: Save successful” message is displayed.

To download selected information, click the **XML** or **CSV** report buttons.

The file is downloaded to your specified local directory, or you can open it to view in a separate browser window.

27.10 Modify Schedule Operating Limits

The Schedule Detail web page presents schedule-specific data that can be modified on a schedule basis. The operating limits that are defined on a schedule basis override the operating limits that are defined on a unit basis (except for Unit Hourly Updates).

The following operating limits can be overridden on a schedule basis using the Schedule Detail web page:

Discharge Emergency Min (MW) – Within Discharge mode the Discharge Emergency Minimum is the lowest level of power, in MW, the ESR can produce and maintain a stable level of operation. The Operating Company operates the unit (in discharge mode) at this level during a PJM declared Minimum Generation Emergency.

Discharge Economic Min (MW) – Within Discharge mode the Discharge Economic Minimum is the minimum power available for discharge, in MW, from the ESR for economic dispatch.

Discharge Economic Max (MW) – Within Discharge mode and Continuous mode, the Discharge Economic Max MW is the maximum power available for discharge, in MW, from the ESR for economic dispatch.

Discharge Emergency Max (MW) – Within Discharge and Continuous mode, the Discharge Emergency Max is the highest short-term MW level an ESR can produce and may require extraordinary procedures to produce the desired output.

Charge Emergency Min (MW) – Within Charge mode the Charge Emergency Min is the lowest short-term MW charge level an ESR can take in and may require extraordinary procedures to produce the desired intake.

Charge Economic Min (MW) – Within Charge mode the Charge Economic Min MW is the smallest magnitude of charging power available, in MW, from the ESR for economic dispatch.

Charge Economic Max (MW) – Within Charge and Continuous mode, the Charge Economic Max is the greatest magnitude of charging power available, in MW, from the ESR for economic dispatch.

Charge Emergency Max (MW) – Within Charge mode and Continuous mode, the Charge Emergency Max is the greatest magnitude of power, in MW, the ESR can pull from the grid and maintain a stable level of operation. The

Operating Company operates the unit (in charge mode) at this level during a PJM declared Minimum Generation Emergency.

Steps (from the left navigation bar):

Select **Generator**.

Select **Schedules**.

Select the **Detail** tab.

The Schedules Detail web page appears.

Click the Market Day calendar to select the date.

Select the desired portfolio from the Portfolio list.

The Energy Storage resources for the selected portfolio appear in the Location list.

Select the energy storage resource from the Location list.

Select the desired schedule from the Schedules List.

The schedule detail for the selected schedule appears.

Scroll vertically to the **Economic & Emergency** section of the page.

Select and enter data for the following operating limits:

- Discharge Emergency Min. MW
- Discharge Economic Min. MW
- Discharge Economic Max. MW
- Discharge Emergency Max. MW
- Charge Emergency Min. MW
- Charge Economic Min. MW
- Charge Economic Max. MW
- Charge Emergency Max. MW

Click the **Save** button.

“Success: Save successful” message is displayed.

To download selected information, click the **XML** or **CSV** report buttons.

The file is downloaded to your specified local directory, or you can open it to view in a separate browser window.

27.11 Create Daily Schedule Offers

Schedule offers curve consists of MW/price segments. Up to twenty segments can be defined for each schedule.

The first point describes the Economic Minimum Limit of the unit (the slope is equal to zero.)

The segment between points is a calculated slope or block, depending on the status of the Offer Slope Switch.

The last point is equal to the Emergency Maximum Limit (the curve is extended, with a slope equal to zero).

If an Energy Storage Resource is operating in Continuous mode, the schedule offer curve should have a zero-MW segment in order to have the market clearing engine solve. Otherwise, the zero-MW offer segment will be calculated with the interpolated slope by PJM (Use Offer Slope).

Using the Schedule Offer web page, the following data is entered:

MW – The net MW output associated with this segment. If the last MW point is less than the Maximum Emergency Limit, the curve is extended up to the Emergency Maximum Limit using zero slope from the last incremental point on the curve. Values may be negative. The default value is 0.0 MW.

Price – The \$/MW price offer for this segment. The default value is \$0.00. Values may be negative. Additional information on the business rules regarding offer bid caps can be found in **PJM Manual 11: Energy & Ancillary Services Market Operations**.

In addition to providing the MW/Price segments, you need to indicate if an interpolated slope is calculated between segments in a schedule's offer curve. Using the Schedule Detail web page, the following information is required:

Use Offer Slope – Indicates whether an interpolated slope is calculated between segments in a generator offer curve.

✓ – Indicates the offer slope is used to calculate the schedule's offer price.

☐ – Indicates the slope is zero (block-based offer).

Steps (from the left navigation bar):

Select **Generator**.

Select **Schedules**.

Select the **Offers** tab.

The Schedules Offers web page appears.

Click the Market Day calendar to select the date.

Select the desired portfolio from the Portfolio list.

The generating units for the selected portfolio appear in the Location list.

Select the generating unit from the Location list.

Select the schedule from the Schedule list.

The data for the selected unit schedule appears on the Schedule Offers web page.

Right click to display the **Add Item** action button.

Left click to open a new schedule data entry line.

On the new schedule data entry line, enter text into the following fields:

- MW
- Price

Click the **Save** button.

"Success: Save successful" message is displayed.

The new row with the chosen MW and Price will display.

To download selected information, click the **XML** or **CSV** report buttons.

The file is downloaded to your specified local directory, or you can open it to view in a separate browser window.

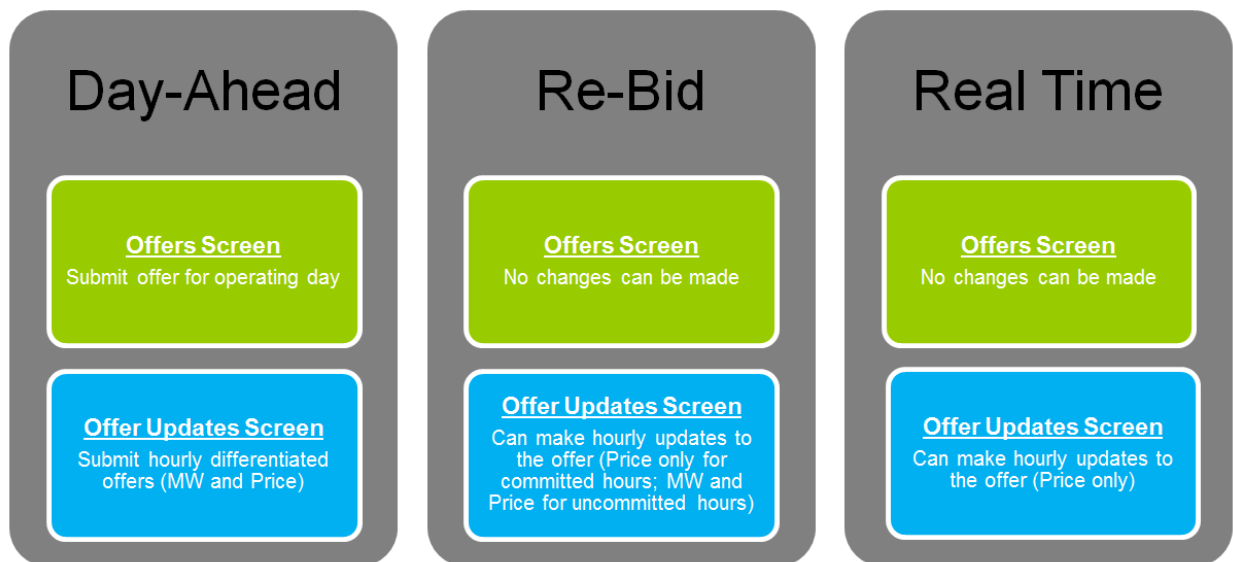
To indicate that you want the offer slope to be used, perform the following Steps (from the left navigation bar):

Left click the Use Offer Slope field.

A ✓ appears in the Use Offer Slope check box.

27.12 Create Hourly Schedule Offers

In order to create hourly differentiated schedule offers for the Day-Ahead Market, a daily schedule offer curve must first be submitted through the Schedule Offers tab. In Real-Time, daily and hourly schedule offers can be updated through the Schedule Offer Updates page. All hourly updates must be made at least 65 minutes prior to the start of the operating hour. Below is a guideline showing which parameters may be updated during which times:



The Day-Ahead market closes at 1100. The Re-Bidding period for the balancing market is from posting of Day-Ahead market results (but not prior to 1200) to 1415 daily. If a unit clears a Day-Ahead position (committed in Day-Ahead), no updates can be made to Offer MW for committed hours. Updates are permitted to the offer price for all hours; however, price schedule offer price cannot be increased for an hour that is committed. If a unit does not clear a Day-Ahead position (not committed in Day-Ahead), the Offer MW is editable through the end of the Re-Bid period (1415), and updates are permitted to the offer price for all uncommitted hours.

If a unit chooses to opt out of Intraday Hourly Offers and they have not entered a Day-Ahead hourly differentiated offer (they only have a Daily Offer) and they have not cleared a Day-Ahead position, during the Re-Bid period the participant may update their daily offer or enter an hourly differentiated offer. After the Re-Bid period is closed, no further updates to the hourly differentiated offer or the daily offer will be allowed.

Using the Schedule Offer Updates web page, you can update the following data:

MW – The net MW output associated with this hourly segment. Updates to the MW value may only be made up to the rebid period the day before the operating day. Values may be negative.

Price – The \$/MW price offer for this segment. The default value is \$0.00. Values may be negative. Additional information on the business rules regarding offer bid caps can be found in **PJM Manual 11: Energy & Ancillary Services Market Operations**.

Steps (from the left navigation bar) for submitting hourly differentiated offers:

Select **Generator**.

Select **Schedules**.

Select the **Offer Updates** tab.

The Offer Updates web page appears.

Click the Market Day calendar to select the date.

Select the desired portfolio from the Portfolio list.

The Energy Storage resources for the selected portfolio appear in the Location list.

Select the energy storage resource from the Location list.

Select the schedule from the Schedule list.

The data for the selected unit schedule appears on the Offer Updates web page.

Left click on a specific hour to highlight that hour.

Right-click on that highlighted hour to display the drop-down menu.

Left click on **Add Segment** action button.

On the new hourly offer updates data entry line, enter values into the following fields:

- MW
- Price

To remove a segment, right-click on selected segment, then left-click on **Delete Segment** action button.

Hourly offer curves can be added for one-hour, multiple hours, or all hours. If an hour is not populated, it will default to use the daily offer curve for that hour.

Click the **Save** button.

“Success: Save successful” message is displayed.

The new segment with the chosen MW and Price will display for the selected hour.

To download selected information, click the **XML** or **CSV** report buttons.

The file is downloaded to your specified local directory, or you can open it to view in a separate browser window.

Steps (from the left navigation bar) for submitting hourly offer updates:

Select **Generator**.

Select **Schedules**.

Select the **Offer Updates** tab.

The Offer Updates web page appears.

Click the Market Day calendar to select the date.

Select the desired portfolio from the Portfolio list.

The Energy Storage resources for the selected portfolio appear in the Location list.

Select the energy storage from the Location list.

Select the schedule from the Schedule list.

The data for the selected unit schedule appears on the Offer Updates web page.

Right-click on any hour to display the drop-down menu.

Left click on **Copy Defaults** action button.

Left click on a specific hour to highlight that hour.

Right-click on that highlighted hour to display the drop-down menu.

Left click on **Paste To Hour(s)** action button.

On the default data entry line, enter values into the following fields:

- Price

Updates to the price can be made for one hour or multiple hours at once. If an hour is not populated, it will default to use the daily offer curve for that hour. Once an update is saved, it cannot be removed.

Click the **Save** button.

“Success: Save successful” message is displayed.

The new segment with the chosen MW and Price will display for the selected hour.

To download selected information, click the **XML** or **CSV** report buttons.

The file is downloaded to your specified local directory, or you can open it to view in a separate browser window.

27.13 Select Schedules to be Available

The Schedule Selection web page is used to mark schedules “available”. At least one cost-based schedule must be made available. For Price based capacity resources, one price-based PLS schedule must be made available. One price-based schedule can be made available.

The Schedule Selection web page presents all schedules for all units in a portfolio. The following information is presented:

Location – The full name of the Energy Storage resource.

Type – The schedule type. The S part of the CPTUS code. This is the Schedule Type field entered on the Schedule Manager web page.

Parameter Limited – Indicates whether the schedule is Parameter Limited or not.

Schedule Name – The full name of a unit schedule. This is the Description field entered on the Schedule Manager web page.

Availability – Indicates the availability status of the energy storage resource’s schedules. “Available” indicates that the schedule is available for PJM to choose for the Operating Day. “Not Available” indicates that the schedule is not available for PJM to choose for the Operating Day. “Not Available” is the default.

Steps (from the left navigation bar):

Select **Generator**.

Select **Schedules**.

Select the **Selection** tab.

The Schedules Selection web page appears.

Click the Market Day calendar to select the date.

Select the desired portfolio from the Portfolio list.

The generating units for the selected portfolio appear in the Location list.

Select the generating unit from the Location list.

The data for the selected unit schedule appears on the Schedule Selection web page.

Locate and click in the Availability column of the row with the Schedule to be selected.

Click in the check box to modify the Availability of the Schedule.

Click the **Save** button.

“Success: Save successful” message is displayed.

The row will display with the modified Availability.

To download selected information, click the **XML** or **CSV** report buttons.

The file is downloaded to your specified local directory, or you can open it to view in a separate browser window.

28.0 Downloading & Posting XML Files

28.1 File Download Overview

Market Participants have two primary methods of interacting with the PJM Day-Ahead Market. The methods are:

- **Web-based Interactions** – Access is provided through a series of worldwide, web-based interactive displays, which are accessible using the Markets Gateway MUI. Section 2 of this User Guide describes the displays.
- **Browserless XML-formatted File Exchange** – Input and output files can be posted and downloaded using participant created applications and/or other 3rd party created application(s). Please reference the External Specification Guide and the Quick Start Guide on the Markets Gateway Tool Page for details. There are also sample applications provided on the Markets Gateway Tool page that can assist in the development of external applications.

28.2 Which Web Pages do I Use?

The following web page is used to transmit XML-formatted files:

- **XML Upload** – Use this web page to upload/download XML files that adhere to Markets Gateway XML. This page can be found under the System Utilities menu option.

28.3 Download Public XML-formatted Files

The PJM External Interface Specification document identifies the information that can be posted via XML-formatted files.

Public users can download Day-Ahead results. The following public files are available for downloading:

- Messages
- Node List
- Demand Summary
- Market Prices
- Interface Limits
- Net Tie Schedules
- Binding Limits
- Reliability Analysis Schedule MW
- Day-Ahead Schedule MW
- Regulation Results
- DA Synchronized Reserve Results
- RT Synchronized Reserve Results
- DA Primary Reserve Results
- RT Primary Reserve Results
- DA 30 Minute Reserve Results
- RT 30 Minute Reserve Results

Steps (from the left navigation bar):

Select **Public**.

Select **Reports**.

The Report Download web page appears.

Click the Market Day calendar to select the date.

Select desired report(s) by clicking on the desired radio button:

- ☐ Messages
- ☐ Node List
- ☐ Demand Summary
- ☐ Market Prices
- ☐ Interface Limits
- ☐ Net Tie Schedules
- ☐ Binding Limits
- ☐ Reliability Analysis Schedule MW
- ☐ Day-Ahead Schedule MW
- ☐ Regulation Results
- ☐ DA Synchronized Reserve Results
- ☐ RT Synchronized Reserve Results
- ☐ DA Primary Reserve Results
- ☐ RT Primary Reserve Results
- ☐ DA 30 Minute Reserve Results
- ☐ RT 30 Minute Reserve Results

To download selected report, click the **XML** button.

The file is downloaded to your specified local directory, or you can open it to view in a separate browser window.

28.4 Download Generation XML-formatted Files

The PJM External Interface Specification document identifies the information that can be downloaded via XML-formatted files.

The following generation files are available for downloading:

- Query for Bid Node List
- Query for Dispatch Lambda
- Query for Market Results
- Query for Synchronized Reserve and Regulation Award

The following public files are also available for downloading:

- Query Binding Limits
- Query for Demand Summary
- Query for Interface Limits
- Query for Market Prices
- Query for Messages
- Query for Net Tie Schedules
- Query for Regulation Results
- Query for Synchronized Reserve Results
- Query Portfolios

Steps (from the left navigation bar):

Select **System Utilities**.

Select the **XML Upload** tab.

Click the **Choose File** button.

Your local directory appears.

Select desired file from local directory.

Click the **Upload** button.

To download selected report, click the **XML** button.

The file is downloaded to your specified local directory, or you can open it to view in a separate browser window.

28.5 Submit Generation XML-formatted Files

The PJM External Interface Specification document identifies the information that can be submitted via XML-formatted files.

The following generation files are available for submittal:

- Submit Unit Details
- Submit Unit Schedules
- Submit Unit Updates
- Submit Weather Forecast
- Submit Schedule Offers
- Submit Schedule Detail
- Submit Schedule Selection
- Submit Regulation Offer
- Submit Regulation Updates
- Submit Synchronized Reserve Offer

- Submit Synchronized Reserve Updates

Steps (from the left navigation bar):

Select **System Utilities**.

Select the **XML Upload** tab.

Click the **Choose File** button.

Your local directory appears.

Select desired file from local directory.

Click the **Upload** button.

To download selected report, click the **XML** button.

The file is downloaded to your specified local directory, or you can open it to view in a separate browser window.

28.6 Download Demand XML-formatted Files

The PJM External Interface Specification document identifies the information that can be downloaded via XML-formatted files.

The following demand files are available for downloading:

- Query for Market Results
- Query for Demand Summary
- Query for Bid Node List

The following public files are also available for downloading:

- Query Binding Limits
- Query for Demand Summary
- Query for Interface Limits
- Query for Market Prices
- Query for Messages
- Query for Net Tie Schedules
- Query for Node List
- Query for Regulation Results
- Query for Synchronized Reserve Results
- Query Portfolios

Steps (from the left navigation bar):

Select **System Utilities**.

Select the **XML Upload** tab.

Click the **Choose File** button.

Your local directory appears.

Select desired file from local directory.

Click the **Upload** button.

To download selected report, click the **XML** button.

The file is downloaded to your specified local directory, or you can open it to view in a separate browser window.

28.7 Submit Demand XML-formatted Files

The PJM External Interface Specification document identifies the information that can be submitted via XML-formatted files.

The following demand files are available for submittal:

- Submit Demand Bids
- Submit Distribution Factors
- Submit Load Response
- Submit Virtual (Inc/Dec) Bids

Steps (from the left navigation bar):

Select **System Utilities**.

Select the **XML Upload** tab.

Click the **Choose File** button.

Your local directory appears.

Select desired file from local directory.

Click the **Upload** button.

To download selected report, click the **XML** button.

The file is downloaded to your specified local directory, or you can open it to view in a separate browser window.

28.8 Download XML Files by Transaction

The PJM External Interface Specification document identifies the information that can be downloaded via XML-formatted files.

The following files are available for download:

- Query by Transaction Upload

Steps (from the left navigation bar):

Select **System Utilities**.

Select the **XML Upload** tab.

Click the **Choose File** button.

Your local directory appears.

Select desired file from local directory.

Click the **Upload** button.

To download selected report, click the **XML** button.

The file is downloaded to your specified local directory, or you can open it to view in a separate browser window.

29.0 Managing Price Responsive Demand Portfolios

29.1 Price Responsive Demand Portfolio Overview

Price Responsive Demand portfolios are required for participation in the Price Responsive Demand market.

Users create Price Responsive Demand portfolios by selecting from a collection of locations that represent the pricing nodes of Price Responsive Demand registrations confirmed beforehand in DR Hub. There is no limitation to the number of portfolios created; nor is there a limit to the number of Price Responsive Demand locations that can be "assigned" to a portfolio. Price Responsive Demand locations may be in more than one portfolio.

NOTE: A Price Responsive Demand portfolio is any portfolio that has at least one location of the type 'Demand'.

29.2 Which Web Pages Do I Use?

Use the following web pages to manage Price Responsive Demand portfolios:

- System Utilities – click on Portfolios Tab — to view existing Price Responsive Demand portfolios and create, update and delete Price Responsive Demand portfolios.

29.3 View Existing Price Responsive Demand Portfolios

Price Responsive Demand portfolios are required in the Portfolio filter on all Markets Gateway pages for Price Responsive Demand. Users can view existing Price Responsive Demand portfolios in two ways.

First, users can view existing portfolios in the System Utilities tab:

Steps (from the left navigation bar):

Select **System Utilities**.

Select the **Portfolios** tab.

The Portfolios web page appears.

Note that three sections will display: Portfolios, Portfolio's Locations and Participant's Available Locations.

Existing portfolios are seen (if any) under the Portfolios section under the **Name** heading/section. Locations in a portfolio are seen in the Portfolio's Locations section by selecting/highlighting a portfolio.

Second, users can view existing Price Responsive Demand portfolios in any of the Price Responsive Demand pages by selecting a portfolio and viewing the associated Location list:

Steps (from the left navigation bar):

Select any of the **Price Responsive Demand** pages from the navigation bar:

Select the desired portfolio from the **Portfolios** list.

The Price Responsive Demand locations for the selected portfolio appear in the Location List.

Review the defined Price Responsive Demand locations in the Location list for the selected portfolio.

29.4 Create New Price Responsive Demand Portfolios

Enter the following data when creating a new Price Responsive Demand portfolio:

- **Portfolio** – The name of a Price Responsive Demand portfolio.

- **Location** – The market name of the Price Responsive Demand pricing node used for offers. This name appears in the Location list on the Price Responsive Demand pages.

Steps (from the left navigation bar):

Select **System Utilities**.

Select the **Portfolios** tab.

The Portfolios web page appears.

Note that three columns will display: Portfolios, Portfolio's Locations and Participant's Available Locations.

User **must** right-click in the Portfolios section under the **Name** heading in order to bring up either the **Create** or the **Create/Remove** button. Select **Create**.

*The **Create Portfolio** pop-up text box displays.*

Enter the name of the new portfolio in the **Name** field.

Click **Create**.

The new portfolio name appears in the Portfolios section with red highlight.

Click on the row containing the name of the Portfolio (red highlight).

Note that there are no locations in the Portfolio's Locations section.

*Note that a location **must** be added to the Portfolio in order to **save** the newly created portfolio.*

Continue to the next set of Steps to add a location to the Portfolio.

29.5 Add Price Responsive Demand Location to a Price Responsive Demand Portfolio

A user can add Price Responsive Demand locations to existing portfolios. There is currently no limit to the number of Price Responsive Demand locations that can be assigned to a portfolio. A Price Responsive Demand location can be assigned to more than one portfolio.

Steps (from the left navigation bar):

Select **System Utilities**.

Select the **Portfolios** tab.

The Portfolios web page appears.

Note that three columns will display: Portfolios, Portfolio's Locations and Participant's Available Locations.

Locate the Portfolio to which a new location is to be added.

Click on the row containing the name of the Portfolio to add locations.

Click on a row (i.e. a location) in the list of Participant's Available Locations to select the location.

*Locations are found by using the vertical scroll bar to the far right or the filter boxes at the top of the columns in the Participant's Available Locations section. Type 'Demand' (and press Enter) into the **Type** filter to bring up a list of eligible Price Responsive Demand locations (pricing nodes) for the portfolio.*

Locate the block of 4 single and double arrow buttons adjacent to the Location list.

Click on the left arrow button to add a location to the Portfolio.

The selected Location appears in the center set of columns containing the Portfolio's Locations.

Repeat the row selection and addition for as many Locations are to be included in the Portfolio.

Note that clicking on the double arrow will add ALL available locations to the portfolio.

Click the **Save** button to retain the Portfolio with its new Location(s).

"Success: Save successful" message is displayed.

29.6 Delete Price Responsive Demand Portfolio

A user can delete an entire Price Responsive Demand portfolio or a Price Responsive Demand location within a portfolio. Once a portfolio is deleted, the Price Responsive Demand locations assigned to that portfolio are deleted as well.

Steps (from the left navigation bar):

Select **System Utilities**.

Select the **Portfolios** tab.

The Portfolios web page appears.

Select and highlight the portfolio's name in the Portfolio field.

Right-click and select the **Remove** button to delete the selected portfolio.

The portfolio disappears from the Portfolio list.

Click the **Save** button to delete the portfolio or click Refresh to retain the portfolio.

"Success: Save successful" message is displayed.

29.7 Delete a Price Responsive Demand Location from a Price Responsive Demand Portfolio

A user can remove a Price Responsive Demand location from a defined Price Responsive Demand portfolio.

Steps (from the left navigation bar):

Select **System Utilities**.

Select the **Portfolios** tab.

The Portfolios web page appears.

Select and click the portfolio's name in the Portfolio field.

The row will become highlighted.

Select a Price Responsive Demand location by clicking it in the Portfolio's Location section.

The row will become highlighted.

Locate the block of 4 single and double arrow buttons adjacent to the Location list.

Click on the right arrow button to remove a Price Responsive Demand location from the Portfolio.

Click the **Save** button to confirm the removal of location from the Portfolio.

The Save Successful message displays, the row disappears, and the Location is deleted.

30.0 Managing Price Responsive Demand Offers

30.1 Price Responsive Demand Offer Overview

Price Responsive Demand participants **must** submit Price Responsive Demand offers and operating limits in Markets Gateway.

30.2 Which Web Pages Do I Use?

The following Price Responsive Demand web pages are used to view and manage Price Responsive Demand offers data under the **Price Responsive Demand** menu in the navigation bar:

- **Response Curve** – Use this web page to submit hourly ID/Price/MW segment offer curves.
- **Hourly Data** – Use this web page to submit hourly operating limits.

30.3 Price Responsive Demand Offer Curves

Users must submit hourly offer curves for a specific expected MW load value at a certain price. Users must submit at least one segment and can enter up to ten Price/MW segments per hour in monotonically ascending ID/MW values that define the points on the offer block/slope. Users can edit from one to seven days forward from current day when Market is open; only two to seven days when Market is closed or after RACC run. An hourly Price Responsive Demand offer curve consists of the following data on the Markets Gateway Price Responsive Demand menu, on the Response Curve tab:

- **ID** – The identification number (integer) of the Price/MW segment. Must be monotonically ascending by a value of 1. User must enter at least one segment, up to 10 segments per hour.
- **MW** – The MW offer for a specific expected load value must be a positive number, specified to a single decimal place. Must be monotonically ascending order.
- **Price** – The price, in \$/MW, for the expected load value on the curve.

Steps (from the left navigation bar):

Select **Price Responsive Demand**.

Select the **Response Curve** tab.

Click the Market Day calendar to select the date.

Select the desired portfolio from the Portfolios List.

The Price Responsive Demand locations included in the portfolio appear in the Location List.

Select the desired Price Responsive Demand location from the Location List.

Right-click on any portion of the table to open up the dropdown box and click “**Expand All**” to reveal any existing data.

The data for the selected Price Responsive Demand location appears (if any).

Note that a selectable checkbox appears to the left of any row (hour) that is editable. Note that by **left clicking** on the checkbox a checkmark will appear in the box. Clicking the box again will remove the checkmark. **The checkmark is required in order to save any changes made to that hour.**

By Right-clicking (in table area):

When **no row** is highlighted, a dropdown box appears that allows the user to **Copy All/Paste All** values. There are also options to **Expand** or **Collapse** all the segments for view.

When **a row with an hour** is highlighted, a dropdown box appears that allows the user to copy the data in the hour, or paste to the hour, or **Add** a segment to the hour (limited to 10 segments),

When **a row with an ID/Price/MW segment** is highlighted, a dropdown box appears that allows the user to **Add** a segment or **Delete** the highlighted segment.

By Left clicking (in table area):

On any row highlights that row and automatically enters a checkmark into the checkbox for that row.

Users may

Edit ID/Price/MW segments that appear.

Add segments (limited to 10 segments per hour)

Delete segments.

Copy/Paste values from one hourly block to another.

To Edit a segment, select the row and make desired changes. Make sure the checkmark box for that hour has a checkmark and Click the **Save** button.

“Success: Save successful” message is displayed.

To Add a segment, Left click on any row associated with the hour to add, and then right-click and select **“Add Segment”** from the dropdown box.

On the new hourly offer updates segment line, enter values into the following fields:

- ID (integer)
- MW (to a single decimal place)
- Price (\$/MWh)

Make sure the checkmark box for that hour has a checkmark and Click the **Save** button.

“Success: Save successful” message is displayed.

To Delete a segment, right-click on selected *segment*, then select **“Delete Segment”**.

Make sure the checkmark box for that hour has a checkmark and Click the Save button.

“Success: Save successful” message is displayed.

To Copy/Paste

Hourly values: right-click on a row that highlights an hour and select **“Copy Hourly Block”**. The user may then paste the values to any *hour* or block of *hours* that is highlighted by right-clicking and selecting **“Paste Hourly Block”**. User will not be able to paste to a row that highlights a segment.

Make sure the checkmark box for that hour has a checkmark and Click the Save button.

“Success: Save successful” message is displayed.

To download selected information, click the **XML** or **CSV** report buttons.

The file is downloaded to your specified local directory, or you can open it to view in a separate browser window.

30.4 Hourly Operating Limits

Users **must** submit hourly operating limits on the Price Responsive Demand menu on the **Hourly Data** tab. Note that hourly operating limits can be modified up to 3 hours prior to the operating hour of the same market day. MW values are to the single decimal place. The following operating limits are entered into the Hourly Updates tab:

Min. MW – Expected Load level after reduction when $LMP > \text{Price}$ for the hour. User must always include non-null values for all hours available for participation.

Max. MW – Expected Load level when $LMP < \text{Price}$ for the hour. User must always include non-null values (greater than or equal to Min. MW) for all hours available for participation.

Up Response Rate – Optional MW/hour rate of change to go from a lower MW value to a higher value.

Down Response Rate – Optional MW/hour rate of change to go from a higher MW value to a lower.

Steps (from the left navigation bar):

Select **Price Responsive Demand**.

Select the **Hourly Data** tab.

The Hourly Data web page appears.

Click the Market Day calendar to select the date.

Select the desired portfolio from the Portfolios List.

The Price Responsive Demand locations included in the portfolio appear in the Location List.

Select the desired Price Responsive Demand location from the Location List.

The data for the selected Price Responsive Demand location appears (if any).

Enter the following data for each hour of each Price Responsive Demand location:

- Min. MW
- Max. MW (must be greater than or equal to Min. MW)
- Up Response Rate (optional)
- Down Response Rate (optional)

Click the **Save** button.

“Success: Save successful” message is displayed.

To Copy/Paste

Right-click on a row that highlights an hour and select **“Copy Item”**. The user may then paste the values to any *hour* or block of *hours* that is highlighted by right-clicking and selecting **“Paste Item”**.

Make sure the checkmark box for that hour has a checkmark and Click the Save button.

“Success: Save successful” message is displayed.

To download selected information, click the **XML** or **CSV** report buttons.

The file is downloaded to your specified local directory, or you can open it to view in a separate browser window.

31.0 Wind Forecasts

31.1 Unit Generator Data Overview

The hourly wind forecast data is made available within Markets Gateway so that wind unit owners/marketers may view the forecast data and have the ability to copy the information into the unit's - Hourly Update page.

31.2 Which Web Pages Do I Use?

The following web page is used to view and manage wind forecast information:

Wind Forecast – Use this web page to view the wind forecast information.

31.3 View Wind Forecast Information

PJM provides the Markets Gateway Wind Forecast web page for viewing the hourly wind forecast data of wind generators. This data is calculated by PJM and is not editable or able to be uploaded from the participant. The forecast data can be viewed and copied to the Unit Hourly Update page.

Forecast MW – The forecasted wind MW for the hour and selected location.

Steps (from the left navigation bar):

Select **Generator**.

Select **Unit**.

Select the **Wind Forecast** tab.

The Wind Forecast web page appears.

Select the desired portfolio from the Portfolios list.

The list of Wind resources for the selected portfolio appears in the List.

Select the desired location from the Location list.

The forecast data for the selected unit appears on the Web Forecast page.

Review the following unit-specific information:

- Forecast MW

To download selected information, click the **XML** or **CSV** report buttons.

The file is downloaded to your specified local directory, or you can open it to view in a separate browser window.

32.0 Solar Forecasts

32.1 Unit Generator Data Overview

The hourly solar forecast data is made available within Markets Gateway so that solar unit owners/marketers may view the forecast data and have the ability to copy the information into the unit's - Hourly Update page.

32.2 Which Web Pages Do I Use?

The following web page is used to view and manage solar forecast information:

Solar Forecast – Use this web page to view the solar forecast information.

32.3 View Solar Forecast Information

PJM provides the Markets Gateway Solar Forecast web page for viewing the hourly solar forecast data of solar generators. This data is calculated by PJM and is not editable or able to be uploaded from the participant. The forecast data can be viewed and copied to the Unit Hourly Update page.

Forecast MW – The forecasted solar MW for the hour and selected location.

Steps (from the left navigation bar):

Select **Generator**.

Select **Unit**.

Select the **Solar Forecast** tab.

The Solar Forecast web page appears.

Select the desired portfolio from the Portfolios list.

The list of Solar resources for the selected portfolio appears in the List.

Select the desired location from the Location list.

The forecast data for the selected unit appears on the Web Forecast page.

Review the following unit-specific information:

- Forecast MW

To download selected information, click the **XML** or **CSV** report buttons.

The file is downloaded to your specified local directory, or you can open it to view in a separate browser window.

33.0 Managing Hybrid Resources

33.1 Unit Generator Data Overview

Hybrid resource data is defined on a unit-basis, as well as a schedule basis. Data defined on a unit basis includes unit ownership information, operating limits, ramp rates, CT weather curve data, availability status and Startup and No-Load prices for priced-based units. Regulation limits are also defined on a unit basis.

A hybrid resource is a resource composed of one generation component and one energy storage resource component behind the same point of interconnection operating in the capacity, energy, and/or ancillary services market(s) as a single integrated resource. If a Hybrid Resource is composed of only renewable types of generation (such as wind and solar), it shall be treated as an intermittent type of generation. A “Closed Loop” Hybrid Resource is a hybrid resource that is physically or contractually incapable of charging from the grid. An “Open Loop” Hybrid Resource is a hybrid resource that is physically and contractually capable of charging from the grid.

33.2 Which Web Pages Do I Use for Unit-Level?

The following web page is used to view and manage unit-level information:

Unit Detail – Use this web page to view unit ownership information and modify unit operating limits and ramp rates.

Intraday Opt Out – Use this web page to opt out of the hourly updates functionality on a monthly basis.

33.3 View Unit-specific Ownership Information

PJM requires that the Operating Company submit to PJM unit-specific information about a Hybrid Resource. This information is used to create the initial generating unit record in the Markets Database. This information is submitted in writing to PJM prior to the Operating Company submitting offers (For more information on the data that is required, see **PJM Manual 11: Energy & Ancillary Services Market Operations and the Markets Database Dictionary**).

Upon receipt of information, PJM creates the necessary records in the Markets Database. Some of this information is included on the Unit Detail web page but cannot be modified. The following unit-specific information is presented:

Type of Unit – The long name of the type of unit.

Unit Number – The Hybrid Resource’s identifier at a site or plant.

Operating Company – The full name of the Market Participant that is responsible for operating the Hybrid Resource.

Plant Name – The full name of the plant. A plant is a group of generating units located at the same site.

Unit Name – The abbreviated name of the Hybrid Resource.

Node – A valid PJM price node, or bus, for which PJM calculates Day-Ahead and Real-Time LMPs. PJM and the EDC assign the price node for each generating unit based on the unit’s telemetry and on the PJM state estimator model.

Capacity Resource – Indicates if the Hybrid Resource is a Capacity resource.

Regulation Resource – Indicates if the Hybrid Resource is a Regulation resource as certified by PJM.

Steps (from the left navigation bar):

Select **Generator**.

Select **Unit**.

Select the **Detail** tab.

The Unit Detail web page appears.

Click the Market Day calendar to select the date.

Select the desired portfolio from the Portfolios list.

The list of Hybrid resources for the selected portfolio appears in the Units List.

Select the desired location from the Location list.

The unit data for the selected unit appears on the Unit Detail page.

Review the following unit-specific ownership information:

- Type of Unit
- Unit Number
- Operating Company
- Plant Name
- Unit Name
- Node
- Capacity Resource
- Regulation Resource
- Fast Start
- Closed Loop Hybrid or Open Loop Hybrid

To download selected information, click the **XML** or **CSV** report buttons.

The file is downloaded to your specified local directory, or you can open it to view in a separate browser window.

33.4 View & Modify Unit MW Limits for Closed Loop Hybrid Resources

MW operating limits must be specified at the unit level but can be overridden at a schedule level and on an hourly basis. The hierarchy of MW operating limits is:

- A hybrid resource's default unit MW limits are superseded by the unit's schedule MW operating limits.
- Unit hourly overrides to operating limits supersede all other operating limits.

The following daily limits are required at a hybrid resource level and can be modified using the Unit Detail web page:

Discharge Emergency Min (MW) – Within Discharge mode the Discharge Emergency Minimum is the lowest level of power, in MW, the hybrid resource can produce and maintain a stable level of operation. The Operating Company operates the unit (in discharge mode) at this level during a PJM declared Minimum Generation Emergency.

Discharge Economic Min (MW) – Within Discharge mode the Discharge Economic Minimum is the minimum power available for discharge, in MW, from the hybrid resource for economic dispatch.

Discharge Economic Max (MW) – Within Discharge mode, the Discharge Economic Max is the maximum power available for discharge, in MW, from the hybrid resource for economic dispatch.

Discharge Emergency Max (MW) – Within Discharge mode, the Discharge Emergency Max is the highest short-term MW level a hybrid resource can produce and may require extraordinary procedures to produce the desired output.

Discharge Synch Max (MW) – The maximum value, in MW, of output a resource (in Discharge mode) can achieve in response to a synchronized reserve event. This quantity is defined as the increase in discharge output achievable by the unit in ten (10) minutes. This is the default Discharge Synch Maximum Limit. The default value is 0.0 MW. *Submitted values must be equal to submitted Discharge Economic Maximum unless an exception is requested/approved. See Manual 11, Section 4.2.2.1 for more information.*

Discharge Secondary Max (MW) – The maximum value, in MW, of output a resource (in Discharge mode) can achieve in response to a secondary reserve event. This quantity is defined as the increase in discharge output achievable by the unit in ten (10) minutes. This is the default Discharge Secondary Maximum Limit. The default value is 0.0 MW. *Submitted values must be equal to submitted Discharge Economic Maximum unless an exception is requested/approved. See Manual 11, Section 4.2.2.1 for more information.*

State of Charge Min (MWh) – The minimum State of Charge, in MWh, that should be maintained.

State of Charge Max (MWh) – The maximum State of Charge, in MWh, that should not be exceeded.

Ramp Rate (MW/Min.) – The default energy ramp rate, in MW/minute, for increasing or decreasing a unit's output. This default rate is used by PJM in the Day-Ahead commitment process. The default value is 1.0 MW/minute.

Steps (from the left navigation bar):

Select **Generator**.

Select **Unit**.

Select the **Detail** tab.

The Unit Detail web page appears.

Click the Market Day calendar to select the date.

Select the desired portfolio from the Portfolios list.

The list of generating units for the selected portfolio appears in the Location List.

Select the desired location from the Location list.

The unit data for the selected unit appears on the Unit Detail page.

Review the following unit-specific information:

- Discharge Emergency Min (MW)
- Discharge Emergency Max (MW)
- Discharge Economic Min (MW)
- Discharge Economic Max (MW)
- Discharge Synch Max (MW)
- Discharge Secondary Max (MW)
- State of Charge Min (MW)
- State of Charge Max (MW)

- Ramp Rate (MW/Min.)

Select the value you wish to update.

An entry box will appear.

Update the limits by entering the new value.

Click the **Save** button.

“Success: Save successful” message is displayed.

To download selected information, click the **XML** or **CSV** report buttons.

The file is downloaded to your specified local directory, or you can open it to view in a separate browser window.

33.5 View & Modify Unit MW Limits for Open Loop Hybrid Resources

MW operating limits must be specified at the unit level but can be overridden at a schedule level and on an hourly basis. The hierarchy of MW operating limits is:

- A hybrid resource's default unit MW limits are superseded by the unit's schedule MW operating limits.
- Unit hourly overrides to operating limits supersede all other operating limits.

The following daily limits are required at a hybrid resource level and can be modified using the Unit Detail web page:

Discharge Emergency Min (MW) – Within Discharge mode the Discharge Emergency Minimum is the lowest level of power, in MW, the hybrid resource can produce and maintain a stable level of operation. The Operating Company operates the unit (in discharge mode) at this level during a PJM declared Minimum Generation Emergency.

Discharge Economic Min (MW) – Within Discharge mode the Discharge Economic Minimum is the minimum power available for discharge, in MW, from the hybrid resource for economic dispatch.

Discharge Economic Max (MW) – Within Discharge mode and Continuous mode, the Discharge Economic Max is the maximum power available for discharge, in MW, from the hybrid resource for economic dispatch.

Discharge Emergency Max (MW) – Within Discharge and Continuous mode, the Discharge Emergency Max is the highest short-term MW level a hybrid resource can produce and may require extraordinary procedures to produce the desired output.

Charge Emergency Min (MW) – Within Charge mode the Charge Emergency Min is the lowest short-term MW charge level a hybrid resource can take in and may require extraordinary procedures to produce the desired intake.

Charge Economic Min (MW) – Within Charge mode the Charge Economic Min is the smallest magnitude of charging power available, in MW, from the hybrid resource for economic dispatch.

Charge Economic Max (MW) – Within Charge and Continuous mode, the Charge Economic Max is the greatest magnitude of charging power available, in MW, from the hybrid resource for economic dispatch.

Charge Emergency Max (MW) – Within Charge mode and Continuous mode, the Charge Emergency Max is the greatest magnitude of power, in MW, the hybrid resource can pull from the grid and maintain a stable level of operation. The Operating Company operates the unit (in charge mode) at this level during a PJM declared Minimum Generation Emergency.

Discharge Synch Max (MW) – The maximum value, in MW, of output a resource (in Discharge or Continuous mode) can achieve in response to a synchronized reserve event. This quantity is defined as the increase in discharge output achievable by the unit in ten (10) minutes. This is the default Discharge Synch Maximum Limit. The default value is 0.0

MW. *Submitted values must be equal to submitted Discharge Economic Maximum unless an exception is requested/approved. See Manual 11, Section 4.2.2.1 for more information.*

Charge Synch Max (MW) – The maximum value, in MW, of output a resource (in Charge mode) can achieve in response to a synchronized reserve event. This quantity is defined as the decrease in charge output achievable by the unit in ten (10) minutes. This is the default Charge Synch Maximum Limit. The default value is 0.0 MW. *Submitted values must be equal to submitted Charge Economic Maximum unless an exception is requested/approved. See Manual 11, Section 4.2.2.1 for more information.*

Discharge Secondary Max (MW) – The maximum value, in MW, of output a resource (in Discharge or Continuous mode) can achieve in response to a secondary reserve event. This quantity is defined as the increase in discharge output achievable by the unit in ten (10) minutes. This is the default Discharge Secondary Maximum Limit. The default value is 0.0 MW. *Submitted values must be equal to submitted Discharge Economic Maximum unless an exception is requested/approved. See Manual 11, Section 4.2.2.1 for more information.*

Charge Secondary Max (MW) – The maximum value, in MW, of output a resource (in Charge mode) can achieve in response to a secondary reserve event. This quantity is defined as the decrease in charge output achievable by the unit in ten (10) minutes. This is the default Charge Secondary Maximum Limit. The default value is 0.0 MW. *Submitted values must be equal to submitted Charge Economic Maximum unless an exception is requested/approved. See Manual 11, Section 4.2.2.1 for more information.*

State of Charge Min (MWh) – The minimum State of Charge, in MWh, that should be maintained.

State of Charge Max (MWh) – The maximum State of Charge, in MWh, that should not be exceeded.

Ramp Rate (MW/Min.) – The default energy ramp rate, in MW/minute, for increasing or decreasing a unit's output. This default rate is used by PJM in the Day-Ahead commitment process. The default value is 1.0 MW/minute.

Steps (from the left navigation bar):

Select **Generator**.

Select **Unit**.

Select the **Detail** tab.

The Unit Detail web page appears.

Click the Market Day calendar to select the date.

Select the desired portfolio from the Portfolios list.

The list of generating units for the selected portfolio appears in the Location List.

Select the desired location from the Location list.

The unit data for the selected unit appears on the Unit Detail page.

Review the following unit-specific information:

- Discharge Emergency Min (MW)
- Discharge Emergency Max (MW)
- Discharge Economic Min (MW)
- Discharge Economic Max (MW)
- Charge Emergency Min (MW)
- Charge Emergency Max (MW)

- Charge Economic Min (MW)
- Charge Economic Max (MW)
- Discharge Synch Max (MW)
- Charge Synch Max (MW)
- Discharge Secondary Max (MW)
- Charge Secondary Max (MW)
- State of Charge Min (MW)
- State of Charge Max (MW)
- Ramp Rate (MW/Min.)

Select the value you wish to update.

An entry box will appear.

Update the limits by entering the new value.

Click the **Save** button.

“Success: Save successful” message is displayed.

To download selected information, click the **XML** or **CSV** report buttons.

The file is downloaded to your specified local directory, or you can open it to view in a separate browser window.

33.6 Define Storage Updates

This section is optional. Data submitted on this Markets Gateway page will not impact any calculations in the PJM pricing engines as the information will be used only for PJM research purposes.

The following information is entered on the Storage Updates web page:

- **State of Charge (MW)** – The hourly state of charge, in MW, of a hybrid resource. These values are managed by the participant and must be manually entered to reflect the state of charge for a hybrid resource. This data is optional and will only be used for PJM research purposes.

Steps (from the left navigation bar):

Select **Generator**.

Select **Unit**.

Select the **Storage Updates** tab.

The Storage Updates web page appears.

Click the Market Day calendar to select the date.

Select the desired portfolio from the Portfolio list.

The list of Energy Storage resources for the selected portfolio appears in the Location list.

Select the desired unit from the Location list.

The State of Charge (MW) data for the selected unit appears on the web page.

Enter the following data:

- State of Charge (MW)

Click the **Save** button.

“Success: Save successful” message is displayed.

To download selected information, click the **XML** or **CSV** report buttons.

The file is downloaded to your specified local directory, or you can open it to view in a separate browser window.

33.7 Managing Hourly Unit Data

The Operating Company can reflect real-time changes to the MW limits and status of the unit by using the Unit Hourly Updates web page. Changes made to the unit data using the Unit Hourly Updates web page supersede all schedule data (Schedule Detail web page), weather curve data (Unit Detail web page) and unit limits (Unit Detail web page). All hourly updates can be made up to the end of the current operating hour.

33.8 Which Web Pages Do I Use for Hourly-Level?

The Operating Company uses the following web pages to submit hourly updates to PJM:

- **Generator → Unit → Hourly Updates** – Use this page to submit updated unit statuses and MW operating limits for hybrid resources.
- **Generator → Regulation Market → Updates** – Use this page to submit updated regulation offers and regulation limits for hybrid resources per operating hour.
- **Generator → Regulation Market → Availability Updates** – Use this page to submit updated regulation availability for hybrid resources per operating interval.
- **Generator → Synchronized Reserve Market → Updates** – Use this page to submit updated Synchronized Reserve offers, or to alter the availability, or to self-schedule on an hourly basis for hybrid resources.
- **Generator → Non-Synchronized Reserve Market → Updates** – Use this page to submit updated Non-Synchronized Reserve offers, or to alter the availability on an hourly basis for hybrid resources.
- **Generator → Secondary Reserve Market → Updates** - Use this page to submit updated Secondary Reserve offers, or to alter the availability on an hourly basis for hybrid resources.

33.9 Submit Revised MW Operating Limits for Closed Loop Hybrid Resources

If the Operating Company needs to revise the MW operating limits to reflect real-time changes, the following information on the Unit Hourly Updates web page is entered:

Hour – A trading interval of one hour, identified by the time at the end of that hour (hour ending).

Discharge Emergency Min (MW) – Within Discharge mode the Discharge Emergency Minimum is the lowest level of power, in MW, the hybrid resource can produce and maintain a stable level of operation. The Operating Company operates the unit (in discharge mode) at this level during a PJM declared Minimum Generation Emergency.

Discharge Economic Min (MW) – Within Discharge mode the Discharge Economic Minimum is the minimum power available for discharge, in MW, from the hybrid resource for economic dispatch.

Discharge Economic Max (MW) – Within Discharge mode the Discharge Economic Max is the maximum power available for discharge, in MW, from the hybrid resource for economic dispatch.

Discharge Emergency Max (MW) – Within Discharge the Discharge Emergency Max is the highest short-term MW level a hybrid resource can produce and may require extraordinary procedures to produce the desired output.

***Discharge Synch Max (MW)** – The maximum value, in MW, of output a resource (in Discharge mode) can achieve in response to a synchronized reserve event. This quantity is defined as the increase in discharge output achievable by the unit in ten (10) minutes. **This field is hidden for hybrid resources by default unless the resource owner has requested and been approved for an exception to submit these values less than Economic Maximum. See Manual 11, Section 4.2.2.1 for more information.*

***Discharge Secondary Max (MW)** – The maximum value, in MW, of output a resource (in Discharge mode) can achieve in response to a secondary reserve event. This quantity is defined as the increase in discharge output achievable by the unit in ten (10) minutes. **This field is hidden for hybrid resources by default unless the resource owner has requested and been approved for an exception to submit these values less than Economic Maximum. See Manual 11, Section 4.2.2.1 for more information.*

Steps (from the left navigation bar):

Select **Generator**.

Select **Unit**.

Select the **Hourly Updates** tab.

The Hourly Updates web page appears.

Select the current Operating Day.

Select the desired portfolio from the Portfolio list.

The hybrid resources for the selected portfolio appear in the Location list.

Select the desired unit from the Location list.

The data for the selected hybrid resource appears on the Hourly Updates web page.

Enter data for the following operating limits for the specific hours for which to modify the operating limits:

- Discharge Emergency Min. MW
- Discharge Economic Min. MW
- Discharge Economic Max. MW
- Discharge Emergency Max. MW
- *Discharge Synch Max. MW (*hidden by default without exception request/approval*)
- *Discharge Secondary Max. MW (*hidden by default without exception request/approval*)

Click the **Save** button.

“Success: Save successful” message is displayed.

To download selected information, click the **XML** or **CSV** report buttons.

The file is downloaded to your specified local directory, or you can open it to view in a separate browser window.

33.10 Submit Revised MW Operating Limits for Open Loop Hybrid Resources

If the Operating Company needs to revise the MW operating limits to reflect real-time changes, the following information on the Unit Hourly Updates web page is entered:

Hour – A trading interval of one hour, identified by the time at the end of that hour (hour ending).

Discharge Emergency Min (MW) – Within Discharge mode the Discharge Emergency Minimum is the lowest level of power, in MW, the hybrid resource can produce and maintain a stable level of operation. The Operating Company operates the unit (in discharge mode) at this level during a PJM declared Minimum Generation Emergency.

Discharge Economic Min (MW) – Within Discharge mode the Discharge Economic Minimum is the minimum power available for discharge, in MW, from the hybrid resource for economic dispatch.

Discharge Economic Max (MW) – Within Discharge mode and Continuous mode, the Discharge Economic Max MW is the maximum power available for discharge, in MW, from the hybrid resource for economic dispatch.

Discharge Emergency Max (MW) – Within Discharge and Continuous mode, the Discharge Emergency Max is the highest short-term MW level a hybrid resource can produce and may require extraordinary procedures to produce the desired output.

Charge Emergency Min (MW) – Within Charge mode the Charge Emergency Min is the lowest short-term MW charge level a hybrid resource can take in and may require extraordinary procedures to produce the desired intake.

Charge Economic Min (MW) – Within Charge mode the Charge Economic Min MW is the smallest magnitude of charging power available, in MW, from the hybrid resource for economic dispatch.

Charge Economic Max (MW) – Within Charge and Continuous mode, the Charge Economic Max is the greatest magnitude of charging power available, in MW, from the hybrid resource for economic dispatch.

Charge Emergency Max (MW) – Within Charge mode and Continuous mode, the Charge Emergency Max is the greatest magnitude of power, in MW, the hybrid resource can pull from the grid and maintain a stable level of operation. The Operating Company operates the unit (in charge mode) at this level during a PJM declared Minimum Generation Emergency.

***Discharge Synch Max (MW)** – The maximum value, in MW, of output a resource (in Discharge or Continuous mode) can achieve in response to a synchronized reserve event. This quantity is defined as the increase in discharge output achievable by the unit in ten (10) minutes. **This field is hidden for hybrid resources by default unless the resource owner has requested and been approved for an exception to submit these values less than Economic Maximum. See Manual 11, Section 4.2.2.1 for more information.*

***Charge Synch Max (MW)** – The maximum value, in MW, of output a resource (in Charge mode) can achieve in response to a synchronized reserve event. This quantity is defined as the decrease in charge output achievable by the unit in ten (10) minutes. **This field is hidden for hybrid resources by default unless the resource owner has requested and been approved for an exception to submit these values less than Economic Maximum. See Manual 11, Section 4.2.2.1 for more information.*

***Discharge Secondary Max (MW)** – The maximum value, in MW, of output a resource (in Discharge or Continuous mode) can achieve in response to a secondary reserve event. This quantity is defined as the increase in discharge output achievable by the unit in ten (10) minutes. **This field is hidden for hybrid resources by default unless the resource owner has requested and been approved for an exception to submit these values less than Economic Maximum. See Manual 11, Section 4.2.2.1 for more information.*

***Charge Secondary Max (MW)** – The maximum value, in MW, of output a resource (in Charge mode) can achieve in response to a secondary reserve event. This quantity is defined as the decrease in charge output achievable by the unit in ten (10) minutes. **This field is hidden for hybrid resources by default unless the resource owner has requested*

and been approved for an exception to submit these values less than Economic Maximum. See Manual 11, Section 4.2.2.1 for more information.

Steps (from the left navigation bar):

Select **Generator**.

Select **Unit**.

Select the **Hourly Updates** tab.

The Hourly Updates web page appears.

Select the current Operating Day.

Select the desired portfolio from the Portfolio list.

The hybrid resources for the selected portfolio appear in the Location list.

Select the desired unit from the Location list.

The data for the selected hybrid resource appears on the Hourly Updates web page.

Enter data for the following operating limits for the specific hours for which to modify the operating limits:

- Discharge Emergency Min. MW
- Discharge Economic Min. MW
- Discharge Economic Max. MW
- Discharge Emergency Max. MW
- Discharge Synch Max. MW
- Discharge Secondary Max. MW
- Charge Emergency Min. MW
- Charge Economic Min. MW
- Charge Economic Max. MW
- Charge Emergency Max. MW
- Charge Synch Max. MW
- Charge Secondary Max. MW

Click the **Save** button.

“Success: Save successful” message is displayed.

To download selected information, click the **XML** or **CSV** report buttons.

The file is downloaded to your specified local directory, or you can open it to view in a separate browser window.

33.11 Revise the Status of Closed Loop Hybrid Resources

During the Operating Day, the Operating Company can revise the status of the hybrid resource. The following unit status information is presented on the Unit Hourly Updates web page:

Available choices for Commit Status:

- **Discharge** – Indicates whether a unit is injecting energy onto to the grid. MW would be positive on the offer curve.
- **Intermittent** – Indicates intervals where the unit's storage component is not actively managing the net output of the resource, or that the resource is comprised only of some combination of intermittent generation resources such as wind and solar. During intermittent mode, all hybrid resources will be treated similar to Energy Storage Resources in discharging mode.
- **Unavailable** – Indicates whether the unit is available.

Only one of the above statuses may be selected for a unit in a given hour.

Fixed Gen – This field should be set to yes if a hybrid resource intends to remain “fixed” or otherwise not follow PJM real-time dispatch. This flag will be fed into the PJM Unit Dispatch System and will tell the system that the unit will not be responding to PJM dispatch signals. This information is needed to maintain an accurate overall dispatch solution as possible, and PJM encourages all hybrid resources not intending to follow dispatch to check this field. The fixed gen field is not used at all in the PJM settlement calculations and therefore will have no direct effect on operating reserve eligibility. The field is not used by the Day-Ahead market.

Steps (from the left navigation bar):

Select **Generator**.

Select **Unit**.

Select the **Hourly Updates** tab.

The Unit Hourly Updates web page appears.

Select the current Operating Day.

Select the desired portfolio from the Portfolio list.

The hybrid resources for the selected portfolio appear in the Location list.

Select the generating from the Location list.

The data for the selected generating unit appears on the Hourly Updates web page.

Enter data for the specific hours for which to modify the unit status:

Select one of the following statuses:

- Discharge
- Intermittent
- Unavailable

Modify the following fields for the specific hours selected:

- Fixed Gen

Click the **Save** button.

“Success: Save successful” message is displayed.

To download selected information, click the **XML** or **CSV** report buttons.

The file is downloaded to your specified local directory, or you can open it to view in a separate browser window.

33.12 Revise the Status of Open Loop Hybrid Resources

During the Operating Day, the Operating Company can revise the status of the hybrid resource. The following unit status information is presented on the Unit Hourly Updates web page:

Available choices for Commit Status:

- **Charge** – Indicates whether a unit is receiving electric energy from the grid. MW would be negative on the offer curve.
- **Discharge** – Indicates whether a unit is injecting energy onto to the grid. MW would be positive on the offer curve.
- **Continuous** – Indicates that the unit is either receiving electric energy from the grid or injecting electric energy onto the grid. Units in continuous mode would follow PJM dispatch based on the operating range supported by the offer curve and would have an infinite ramp rate.
- **Intermittent** – Indicates intervals where the unit’s storage component is not actively managing the net output of the resource, or that the resource is comprised only of some combination of intermittent generation resources such as wind and solar. During intermittent mode, all hybrid resources will be treated similar to Energy Storage Resources in discharging mode.
- **Unavailable** – Indicates whether the unit is available.

Only one of the above statuses may be selected for a unit in a given hour.

Fixed Gen – This field should be set to yes if a hybrid resource intends to remain “fixed” or otherwise not follow PJM real-time dispatch. This flag will be fed into the PJM Unit Dispatch System and will tell the system that the unit will not be responding to PJM dispatch signals. This information is needed to maintain an accurate overall dispatch solution as possible, and PJM encourages all energy storage resources not intending to follow dispatch to check this field. The fixed gen field is not used at all in the PJM settlement calculations and therefore will have no direct effect on operating reserve eligibility. The field is not used by the Day-Ahead market.

Steps (from the left navigation bar):

Select **Generator**.

Select **Unit**.

Select the **Hourly Updates** tab.

The Unit Hourly Updates web page appears.

Select the current Operating Day.

Select the desired portfolio from the Portfolio list.

The hybrid resources for the selected portfolio appear in the Location list.

Select the generating from the Location list.

The data for the selected generating unit appears on the Hourly Updates web page.

Enter data for the specific hours for which to modify the unit status:

Select one of the following statuses:

- Charge
- Discharge
- Continuous
- Intermittent
- Unavailable

Modify the following fields for the specific hours selected:

- Fixed Gen

Click the **Save** button.

“Success: Save successful” message is displayed.

To download selected information, click the **XML** or **CSV** report buttons.

The file is downloaded to your specified local directory, or you can open it to view in a separate browser window.

33.13 Modify Schedule Operating Limits for Closed Loop Hybrid Resources

The Schedule Detail web page presents schedule-specific data that can be modified on a schedule basis. The operating limits that are defined on a schedule basis override the operating limits that are defined on a unit basis (except for Unit Hourly Updates).

The following operating limits can be overridden on a schedule basis using the Schedule Detail web page:

Discharge Emergency Min (MW) – Within Discharge mode the Discharge Emergency Minimum is the lowest level of power, in MW, the hybrid resource can produce and maintain a stable level of operation. The Operating Company operates the unit (in discharge mode) at this level during a PJM declared Minimum Generation Emergency.

Discharge Economic Min (MW) – Within Discharge mode the Discharge Economic Minimum is the minimum power available for discharge, in MW, from the hybrid resource for economic dispatch.

Discharge Economic Max (MW) – Within Discharge mode the Discharge Economic Max is the maximum power available for discharge, in MW, from the hybrid resource for economic dispatch.

Discharge Emergency Max (MW) – Within Discharge mode the Discharge Emergency Max is the highest short-term MW level a hybrid resource can produce and may require extraordinary procedures to produce the desired output.

Steps (from the left navigation bar):

Select **Generator**.

Select **Schedules**.

Select the **Detail** tab.

The Schedules Detail web page appears.

Click the Market Day calendar to select the date.

Select the desired portfolio from the Portfolio list.

The hybrid resources for the selected portfolio appear in the Location list.

Select the hybrid resource from the Location list.

Select the desired schedule from the Schedules List.

The schedule detail for the selected schedule appears.

Scroll vertically to the **Economic & Emergency** section of the page.

Select and enter data for the following operating limits:

- Discharge Emergency Min. MW
- Discharge Economic Min. MW
- Discharge Economic Max. MW
- Discharge Emergency Max. MW

Click the **Save** button.

“Success: Save successful” message is displayed.

To download selected information, click the **XML** or **CSV** report buttons.

The file is downloaded to your specified local directory, or you can open it to view in a separate browser window.

33.14 Modify Schedule Operating Limits for Open Loop Hybrid Resources

The Schedule Detail web page presents schedule-specific data that can be modified on a schedule basis. The operating limits that are defined on a schedule basis override the operating limits that are defined on a unit basis (except for Unit Hourly Updates).

The following operating limits can be overridden on a schedule basis using the Schedule Detail web page:

Discharge Emergency Min (MW) – Within Discharge mode the Discharge Emergency Minimum is the lowest level of power, in MW, the hybrid resource can produce and maintain a stable level of operation. The Operating Company operates the unit (in discharge mode) at this level during a PJM declared Minimum Generation Emergency.

Discharge Economic Min (MW) – Within Discharge mode the Discharge Economic Minimum is the minimum power available for discharge, in MW, from the hybrid resource for economic dispatch.

Discharge Economic Max (MW) – Within Discharge mode and Continuous mode, the Discharge Economic Max is the maximum power available for discharge, in MW, from the hybrid resource for economic dispatch.

Discharge Emergency Max (MW) – Within Discharge and Continuous mode, the Discharge Emergency Max is the highest short-term MW level a hybrid resource can produce and may require extraordinary procedures to produce the desired output.

Charge Emergency Min (MW) – Within Charge mode the Charge Emergency Min is the lowest short-term MW charge level a hybrid resource can take in and may require extraordinary procedures to produce the desired intake.

Charge Economic Min (MW) – Within Charge mode the Charge Economic Min is the smallest magnitude of charging power available, in MW, from the hybrid resource for economic dispatch.

Charge Economic Max (MW) – Within Charge and Continuous mode, the Charge Economic Max is the greatest magnitude of charging power available, in MW, from the hybrid resource for economic dispatch.

Charge Emergency Max (MW) – Within Charge mode and Continuous mode, the Charge Emergency Max is the greatest magnitude of power, in MW, the hybrid resource can pull from the grid and maintain a stable level of operation. The Operating Company operates the unit (in charge mode) at this level during a PJM declared Minimum Generation Emergency.

Steps (from the left navigation bar):

Select **Generator**.

Select **Schedules**.

Select the **Detail** tab.

The Schedules Detail web page appears.

Click the Market Day calendar to select the date.

Select the desired portfolio from the Portfolio list.

The hybrid resources for the selected portfolio appear in the Location list.

Select the hybrid resource from the Location list.

Select the desired schedule from the Schedules List.

The schedule detail for the selected schedule appears.

Scroll vertically to the **Economic & Emergency** section of the page.

Select and enter data for the following operating limits:

- Discharge Emergency Min. MW
- Discharge Economic Min. MW
- Discharge Economic Max. MW
- Discharge Emergency Max. MW
- Charge Emergency Min. MW
- Charge Economic Min. MW
- Charge Economic Max. MW
- Charge Emergency Max. MW

Click the **Save** button.

“Success: Save successful” message is displayed.

To download selected information, click the **XML** or **CSV** report buttons.

The file is downloaded to your specified local directory, or you can open it to view in a separate browser window.

33.15 Create Daily Schedule Offers

Schedule offers curve consists of MW/price segments. Up to twenty segments can be defined for each schedule.

The first point describes the Economic Minimum Limit of the unit (the slope is equal to zero).

The segment between points is a calculated slope or block, depending on the status of the Offer Slope Switch.

The last point is equal to the Emergency Maximum Limit (the curve is extended, with a slope equal to zero).

If a hybrid resource is operating in Continuous mode, the schedule offer curve should have a zero-MW segment in order to have the market clearing engine solve. Otherwise, the zero-MW offer segment will be calculated with the interpolated slope by PJM (Use Offer Slope).

Using the Schedule Offer web page, the following data is entered:

MW – The net MW output associated with this segment. If the last MW point is less than the Maximum Emergency Limit, the curve is extended up to the Emergency Maximum Limit using zero slope from the last incremental point on the curve. Values may be negative. The default value is 0.0 MW.

Price – The \$/MW price offer for this segment. The default value is \$0.00. Values may be negative. Additional information on the business rules regarding offer bid caps can be found in **PJM Manual 11: Energy & Ancillary Services Market Operations**.

In addition to providing the MW/Price segments, you need to indicate if an interpolated slope is calculated between segments in a schedule's offer curve. Using the Schedule Detail web page, the following information is required:

Use Offer Slope – Indicates whether an interpolated slope is calculated between segments in a generator offer curve.

✓ – Indicates the offer slope is used to calculate the schedule's offer price.

☐ – Indicates the slope is zero (block-based offer).

Steps (from the left navigation bar):

Select **Generator**.

Select **Schedules**.

Select the **Offers** tab.

The Schedules Offers web page appears.

Click the Market Day calendar to select the date.

Select the desired portfolio from the Portfolio list.

The generating units for the selected portfolio appear in the Location list.

Select the generating unit from the Location list.

Select the schedule from the Schedule list.

The data for the selected unit schedule appears on the Schedule Offers web page.

Right click to display the **Add Item** action button.

Left click to open a new schedule data entry line.

On the new schedule data entry line, enter text into the following fields:

- MW
- Price

Click the **Save** button.

"Success: Save successful" message is displayed.

The new row with the chosen MW and Price will display.

To download selected information, click the **XML** or **CSV** report buttons.

The file is downloaded to your specified local directory, or you can open it to view in a separate browser window.

To indicate that you want the offer slope to be used, perform the following Steps (from the left navigation bar):

Left click the Use Offer Slope field.

A ✓ appears in the Use Offer Slope check box.

33.16 Create Hourly Schedule Offers

In order to create hourly differentiated schedule offers for the Day-Ahead Market, a daily schedule offer curve must first be submitted through the Schedule Offers tab. In Real-Time, daily and hourly schedule offers can be updated through the Schedule Offer Updates page. All hourly updates must be made at least 65 minutes prior to the start of the operating hour. Below is a guideline showing which parameters may be updated during which times:

	Offers Screen	Offer Updates Screen
Day-Ahead	Submit offer for operating day	Submit hourly differentiated offers (MW and Price)
Re-Bid	No changes can be made	Can make hourly updates to the offer (Price only for committed hours; MW and Price for uncommitted hours)
Real Time	No changes can be made	Can make hourly updates to the offer (Price only)

The Day-Ahead market closes at 1100. The Re-Bidding period for the balancing market is from posting of Day-Ahead market results (but not prior to 1200) to 1415 daily. If a unit clears a Day-Ahead position (committed in Day-Ahead), no updates can be made to Offer MW for committed hours. Updates are permitted to the offer price for all hours; however, price schedule offer price cannot be increased for an hour that is committed. If a unit does not clear a Day-Ahead position (not committed in Day-Ahead), the Offer MW is editable through the end of the Re-Bid period (1415), and updates are permitted to the offer price for all uncommitted hours.

If a unit chooses to opt out of Intraday Hourly Offers and they have not entered a Day-Ahead hourly differentiated offer (they only have a Daily Offer) and they have not cleared a Day-Ahead position, during the Re-Bid period the participant may update their daily offer or enter an hourly differentiated offer. After the Re-Bid period is closed, no further updates to the hourly differentiated offer or the daily offer will be allowed.

Using the Schedule Offer Updates web page, you can update the following data:

MW – The net MW output associated with this hourly segment. Updates to the MW value may only be made up to the rebid period the day before the operating day. Values may be negative.

Price – The \$/MW price offer for this segment. The default value is \$0.00. Values may be negative. Additional information on the business rules regarding offer bid caps can be found in **PJM Manual 11: Energy & Ancillary Services Market Operations**.

Steps (from the left navigation bar) for submitting hourly differentiated offers:

Select **Generator**.

Select **Schedules**.

Select the **Offer Updates** tab.

The Offer Updates web page appears.

Click the Market Day calendar to select the date.

Select the desired portfolio from the Portfolio list.

The generation resources for the selected portfolio appear in the Location list.

Select the hybrid resource from the Location list.

Select the schedule from the Schedule list.

The data for the selected unit schedule appears on the Offer Updates web page.

Left click on a specific hour to highlight that hour.

Right-click on that highlighted hour to display the drop-down menu.

Left click on **Add Segment** action button.

On the new hourly offer updates data entry line, enter values into the following fields:

- MW
- Price

To remove a segment, right-click on selected segment, then left-click on **Delete Segment** action button.

Hourly offer curves can be added for one hour, multiple hours, or all hours. If an hour is not populated, it will default to use the daily offer curve for that hour.

Click the **Save** button.

“Success: Save successful” message is displayed.

The new segment with the chosen MW and Price will display for the selected hour.

To download selected information, click the **XML** or **CSV** report buttons.

The file is downloaded to your specified local directory, or you can open it to view in a separate browser window.

Steps (from the left navigation bar) for submitting hourly offer updates:

Select **Generator**.

Select **Schedules**.

Select the **Offer Updates** tab.

The Offer Updates web page appears.

Click the Market Day calendar to select the date.

Select the desired portfolio from the Portfolio list.

The generation resources for the selected portfolio appear in the Location list.

Select the hybrid resource from the Location list.

Select the schedule from the Schedule list.

The data for the selected unit schedule appears on the Offer Updates web page.

Right-click on any hour to display the drop-down menu.

Left click on **Copy Defaults** action button.

Left click on a specific hour to highlight that hour.

Right-click on that highlighted hour to display the drop-down menu.

Left click on **Paste To Hour(s)** action button.

On the default data entry line, enter values into the following fields:

- Price

Updates to the price can be made for one hour or multiple hours at once. If an hour is not populated, it will default to use the daily offer curve for that hour. Once an update is saved, it cannot be removed.

Click the **Save** button.

“Success: Save successful” message is displayed.

The new segment with the chosen MW and Price will display for the selected hour.

To download selected information, click the **XML** or **CSV** report buttons.

The file is downloaded to your specified local directory, or you can open it to view in a separate browser window.

33.17 Select Schedules to be Available

The Schedule Selection web page is used to mark schedules “available”. At least one cost-based schedule must be made available. For Price based capacity resources, one price-based PLS schedule must be made available. One price-based schedule can be made available.

The Schedule Selection web page presents all schedules for all units in a portfolio. The following information is presented:

Location – The full name of the hybrid resource.

Type – The schedule type. The S part of the CPTUS code. This is the Schedule Type field entered on the Schedule Manager web page.

Parameter Limited – Indicates whether the schedule is Parameter Limited or not.

Schedule Name – The full name of a unit schedule. This is the Description field entered on the Schedule Manager web page.

Availability – Indicates the availability status of the hybrid resource’s schedules. “Available” indicates that the schedule is available for PJM to choose for the Operating Day. “Not Available” indicates that the schedule is not available for PJM to choose for the Operating Day. “Not Available” is the default.

Steps (from the left navigation bar):

Select **Generator**.

Select **Schedules**.

Select the **Selection** tab.

The Schedules Selection web page appears.

Click the Market Day calendar to select the date.

Select the desired portfolio from the Portfolio list.

The generating units for the selected portfolio appear in the Location list.

Select the generating unit from the Location list.

The data for the selected unit schedule appears on the Schedule Selection web page.

Locate and click in the Availability column of the row with the Schedule to be selected.

Click in the check box to modify the Availability of the Schedule.

Click the **Save** button.

“Success: Save successful” message is displayed.

The row will display with the modified Availability.

To download selected information, click the **XML** or **CSV** report buttons.

The file is downloaded to your specified local directory, or you can open it to view in a separate browser window.

Revision History

2024 Revision

June 2024

- Updated existing section 9.0 on Real-time Values Exception Requests for Parameter Limited Schedules

May 2024

- Updated existing section 8.0 on Managing Generation Unit Schedules to include language on updating reference schedules for Dual Fuel resources

2023 Revision

November 2023

- Updated existing section 8.18 to include language on new enhancements to Fuel Price Exceptions web page for Offer Verification

September 2023

- Updated existing section 17.0 to include language on new Distribution Factors Hourly web page for submitting or updating the default aggregate distributions on an hourly basis

April 2023

- Added new section entitled “Managing Hybrid Resources”
 - This new section is section 33.0
- Updated existing section 6.7 to include language on new rules allowing Cold Startup Cost to be less than Intermediate and Hot Startup Cost as a result of new Soak cost rules in cost-based Start Cost Calculation
- Updated existing section 27.3 to include Fast-Start & Energy Storage resource types
- Updated existing section 27.4 to include language on exceptions for Charge/Discharge Synch/Secondary Max MW in Unit Detail web page
- Updated existing section 27.8 to include language on exceptions for Charge/Discharge Synch/Secondary Max MW in Unit Hourly Updates web page
- Updated existing section 27.11 to include language on zero-MW offer segment for market clearing engines for ESR

2022 Revision

August 2022

- Cover to cover review and edit to include changes for the Reserve Price Formation project

June 2022

- Modifications to include changes for the Reserves Price Formation project.

August 2021

- Update to section 6.3 to include language on Fast Start resource flag
- Update to section 9.2 to include language on Composite Offer Verification
- Added new section 9.19 to include language on Composite Offer Verification for Fast Start Capable Resources

January 2021

- Update to section 6.5 to include language on hourly differentiated segmented ramp rates
- Update to section 5.4 to modify language on generator data for Real-Time operations
- Added new section 6.12 entitled “Unit Limitations”
- Added new section 6.13 entitled “Zero Marginal Cost Fuel Cost Policy”
- Update to sections 9.2 and 9.9 to include language on Gas Contingency Operations and Operational Restrictions
- Update to Sections 9.11 and 25.13 to reflect increase in Energy Offer curve segments from 10 to 20 segments

2020 Revision

June 2020

- Update to Opportunity Cost Calculator Appendix regarding suspension of Markets Gateway calculator
- Update to Section 17.0 to include max allowable bid segments

April 2020

- Update to section 9.2 to include Fuel Price Exceptions
- Added new section 9.16 entitled “Offer Verification for Cost-based Offers Greater than \$1,000/MWh”
- Added new section 9.17 entitled “Offer Verification for Price-based Offers Greater than \$1,000/MWh”
- Added new section 9.18 entitled “Offer Verification Exception Request”

2019 Revision

December 2019

- Added new section entitled “Managing Energy Storage Resources”
 - This new section is now section 25.0
 - “Downloading & Posting XML Files” has moved from section 25.0 to section 26.0

November 2019

- Update to section 17.0 on designation and file location for valid pnodes for Incs/Decs

2018 Revision

December 2018

- Update to sections 1.7, 7.0, 9.12, and 10.5 to change DA market close time from 1030 to 1100

July 2018

- Update to energy ramp rates in sections 6.4 and 6.5.
- Added new section entitled “Managing Pseudo-Tie Transactions”
 - This new section is now section 23.0
 - Managing Transaction Thresholds has moved from section 23.0 to section 24.0
 - Downloading & Posting XML Files has moved from section 24.0 to section 25.0

2017 Revision

November 2017

- Updated Fixed Gen language in section 6.9

July 2017

- Updated with changes for Intraday Offers
 - Section 6.11 – Opt out of intraday hourly offers
 - Section 7.4 – Hourly startup & no load offers for price-based units
 - Section 7.8 – Hourly startup & no load offers for cost-based schedules
 - Section 9.3 – New schedule types
 - Section 9.8 – Modify hourly schedule parameters (removed previous section 9.8 on scheduled market participation switches)
 - Section 9.9 – Added dual fuel availability to this section and removed it from 9.10
 - Section 9.13 – Create hourly schedule offers
 - Section 9.14 – Select schedules to be available
 - Section 11.6 – Update Regulation A hourly offers
 - Section 11.7 – Update Regulation D hourly offers
 - Section 12.5 – Synchronized reserve market updates
 - Section 13.5 thru 13.8 – Removed these sections
 - Section 20.9 – Submit hourly Load Response bids
 - Section 20.10 – Submit revised MW operating limits
 - Section 21.4 – Revise hourly regulating offer and availability
 - Section 22.4 – Revise hourly synchronized reserve offer and availability
- Conforming changes throughout
- Update to energy ramp rates in section 6.5.
- Added Min. Offer MW in section 11.5.

June 2017

- Conforming language changes in section 10.
- Removed footnotes in Appendix.
- Added language regarding missing hour data in sections 1.8, 3.7, 5.5, 21.8, and 22.8.
- Added clarifying language for Self-Scheduled MW in sections 5.5, 21.8 and 22.8.

2016 Revision

June 2016

- Update changes on schedule availability to section 9.13
- Update changes on parameter definitions, Real Time Values and Capacity Performance related rules in section 10.

April 2016

- Clarifying language regarding Spin As Condenser and Condenser Available Status on the Synchronized Reserve Offer page added to section 12.4.

March 2016

- Update changes related to Day-Ahead market timeline per FERC docket no. ER14-24-000 and ER15-226-001.

2015 Revision

July 2015

- Updated Economic Max Definition.

February 2015

- Added Operational Restrictions, Dual Fuel Availability information and Real Time cost schedule Availability Updating.

2014 Revision

2014 Revision – March 2014

- Added “Effective MW” to column labels in View Regulation Market Clearing Results section.

2013 Revision

November 2013

- Updated managing unit data section with CIR data.
- Updated managing generating unit schedules section with CIR data.
- Updated managing hourly unit data section with CIR data.

October 2013

- Updated Load Response portfolio section.
- Updated managing Load Response bid section.
- Updated managing synchronized reserve data for load resources.

September 2013

- Added Extended Markets Gateway Notification section

July 2013

- Inserted information about optional parameters removed from M11 into Regulation Offer Section.
- Removed Ancillary Market Prices Summary information that is no longer displayed in Markets Gateway.
- Inserted information about flexible Tier 2 option for DSR into Synchronized Reserve Data for Load Resources Section.
- Inserted procedure for qualified resources to enter Spin Max value that is lesser than Economic Max.

April 2013

- Removed Market Price for A/S information, because data being posted to eDATA and is no longer posted in Markets Gateway.

- Unit Schedule Type Updated.
- Added Reduced Energy Ramp Rate changes for Unit Detail and Regulation Update screens.
- Added Energy Storage Loss Information for Regulation Offer Screen.
- Added work around to exit edit mode for regulation, synchronized reserve and non-synchronized reserve bilateral screens.

2012 Revisions

October 2012

- Added Changes for Performance Based Regulation and Shortage Pricing including Primary Reserves and Non Synchronized Reserves. Also added sections for Day-Ahead Scheduling Reserves.

June 2012

- Added Changes to Demand Response Section for FERC Order 745

May 2012

- Added Appendix Instructions for Opportunity Cost Calculator

April 2012

- Includes Up-To Transaction Bidding
- Removed CC modeling

2011 Revision

- Includes modifications for Energy Market Opportunity Cost
- Removes references to Regulation Zones
- Update to Spin Max definition
- Update Start Time Definitions

2009 Revision

- Includes modifications for Parameter Limited Schedules
- Includes negative offer pricing for Generator Offers