Disclaimer –

The PJM Markets Gateway User Guide is intended to provide Market Participants and other interested parties with introductory information about the Day-Ahead Market, Real Time Market and Ancillary Services Markets bidding and administrative processes. The User Guide is an instructional tool and is not intended to be a complete source of information about PJM’s bidding and administrative processes. PJM provides no warranties of any kind with respect to the correctness or completeness of the information set forth in this User Guide and, therefore, bears no responsibility for any damages resulting from a Market Participant’s reliance on any error or omission in this guide. The PJM Markets Gateway User Guide is not designed, nor is it intended, to provide advice or guidance with respect to strategies for bidding into the Day-Ahead, Real Time and Ancillary Services markets.

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Current Revision:

2018 Revisions
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
Introduction

The PJM Markets Gateway User Guide provides Market Participants with the information needed to participate in the PJM Day-Ahead Market, Regulation Markets, Synchronized Reserve Markets and PJM Load Response Programs. It describes the Day-Ahead Market software, the Synchronized Reserve and Regulation 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 Market, Real-Time Energy Market, Synchronized Reserve Market and Regulation Market. Market Participants can use PJM Markets Gateway to:

- Prepare and submit generation offers
- Prepare and submit regulation offers
- Prepare and submit synchronized reserve 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 resources adjustable parameters and status intra-day for the Real-Time Energy Market
- Review public and private Day-Ahead Energy Market results
- Review public and private Ancillary Services Market 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 worldwide, web-based interactive displays, which are accessible in 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 the following tasks:

- 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
- 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 information sources:
  - PJM Manuals
  - 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 Market, Real-Time Energy Market and Ancillary Services 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.

1.2 PJM Markets Gateway Components

The purpose of the Day-Ahead Market subsystem is to develop Day-Ahead demand and generation schedules and calculate Day-Ahead LMPs. The Day-Ahead Market software consists of the following three software modules:

- **Resource Scheduling and Commitment (RSC)** — The RSC module performs the security-constrained unit commitment function, while considering factors such as: generation unit start times, minimum run times and unit status. The results of the RSC run produces the generation profile that satisfies the fixed demand, cleared price-sensitive demand bids, cleared dec bids and PJM’s scheduling reserve objectives, while minimizing total production cost (subject to certain transmission limitations).

- **Scheduling Pricing and Dispatch (SPD)** — The SPD module performs the security-constrained economic dispatch and calculates the Day-Ahead LMPs. The solution from SPD is passed to SFT to ensure contingencies are not violated.

- **Simultaneous Feasibility Test (SFT)** — The SFT is the AC security network analysis module, which is capable of modeling all normal and single contingency limitations that are monitored in PJM operations. If violations are encountered, SFT passes control back to SPD, as necessary.

Other PJM systems provide data to PJM Markets Gateway, including external grid/flow modeling, outage schedules and facility ratings.
For the Day-Ahead Energy Market clearing, PJM Markets Gateway consists of the following components:

This is a conceptual view of the Day-Ahead Market software. All of the data exchanges are conceptual.

The Day-Ahead Market process allows Market Participants to submit generation offers and demand bids on a daily basis. Offers to sell energy and bids to buy energy are submitted through the PJM Markets Gateway’s Market User Interface, or MUI. All entered quotes are validated and entered into the Day-Ahead Market database by the MUI.

The purpose of the Synchronized Reserve and Regulation software is to develop market-clearing prices for Synchronized Reserve and Regulation and determine the potential providers of these Ancillary Services. The software uses the results of the Day-Ahead Market and includes four software modules:

- **Ancillary Service Optimizer (ASO)** — The ASO is the Ancillary Service Optimizer software. It jointly optimizes energy offers, reserve offers and regulation offers. The resulting interval-based solution looks 1 hour in the future and makes Ancillary Service commitments to meet requirements. Hourly regulation and inflexible reserve resources commitments are posted to Markets Gateway. Inflexible reserve resources include synchronous condensers and demand response. ASO also performs the Regulation Three Pivotal Supplier (RegTPS) test. ASO does not calculate market clearing prices.

- **Intermediate Security Constrained Economic Dispatch (IT SCED)** — The IT SCED is the Intermediate Term Security Constrained Economic Dispatch or Dispatch Tool that performs joint optimization of energy and reserves. The tool performs a multi-interval, time-coupled solution at 15, 30, 75 and 120 minutes during the look-ahead period to calculate the long-term dispatch trajectory. The result is an incremental resource commitment for energy and reserves. IT SCED also performs the Energy Three Pivotal Supplier (TPS) test. No results from IT SCED will be sent to participants.

- **Real Time Security Constrained Economic Dispatch (RT SCED)** — The RT SCED is the Real Time Security Constrained Economic Dispatch or Dispatch Tool that performs joint optimization of energy and reserves for only those resources that are online, dispatchable resources. The tool performs a single-interval that looks 10 to 20 minutes in the future. Its starting point is the current state estimator solution and
the end state is the forecasted load for the look-ahead period. It calculates the energy basepoints and reserve quantities that are sent to generators. It also dispatches currently assigned regulation resources.

- **Locational Pricing Calculator (LPC)** - The LPC engine is the Locational Pricing Calculator that runs every 5 minutes and provides real-time pricing that jointly optimizes energy and reserves. The current approved RT SCED case is the basis for the LPC case. LPC prices on a five minute basis all valid system pricing points for the energy market: Buses (Gen and Load), Hubs, Aggregates and Interfaces. LPC prices on a 5 minute basis all reserve market clearing prices by locale (Regulation, Synchronized Reserve and Non-Synchronized Reserve). These 5 minute price results are sent to market participants via Data Viewer.
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, using the following Web Browser that Markets Gateway supports:

- Internet Explorer 9 & forward
- Current version of Chrome
- Current version of Firefox
- Current version of Safari

1.4 Accessing the PJM Markets Gateway Application

From the PJM Tools screen, select 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:

- **Gen Read Only** - Users that only view private generation information
- **Gen 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 eSuite.
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.
1.6 PJM Markets Gateway Navigation

Markets Gateway Navigation — The left side Navigation Menu provides links to all required functionality. While Markets Gateway includes the same functional areas as were available from the eMKT 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
  - Day-Ahead Scheduling Reserve
  - Reliability analysis
  - Unit commitment

- **Real Time (operating day)**
  - Near-term reliability analysis
  - Synchronized Reserve Market
  - Regulation Market
  - Real-Time Energy Market

- **Day After (operating day)**
  - Bilateral energy and Ancillary Service 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 until 14:15.

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** – Daily AS offer price and cost can be bid in up to 14:15 the day before the operating day. These daily values cannot be changed. Hourly differentiated AS offer price and cost can be bid in up to 14:15 the day before the operating day. Updates to the offer price and cost can be made in Real Time up to 65 minutes prior to the start of the operating hour. Any hourly updates overwrite the daily offers.

Additional parameters can be changed up to 65 minutes prior to the operating hour.

If the solution for an hour is not posted, the data will not be back populated on the public results page at a future date or time.

1.9 Regulation

1.10 Synchronized Reserve
1.11 Non Synchronized 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*. 
2.0 Managing Information

2.1 Which Web Pages Do I Use?
The following web pages are used to view important information regarding the Day-Ahead Market and Ancillary Service Market:

- **Messages** — use this web page to view public messages

2.2 View Public Messages
Public messages are posted on the Messages web page in descending priority. The message remains in the webpage as long as it is applicable.

The following types of messages are posted on the Public Message web page:

- Dates and times of Markets Gateway outages due to system maintenance
- Notification of system enhancements
- Extension of market bidding periods due to system outages

**Steps to access Public Messages (from the left navigation bar):**

- Select Public.
- Select Messages.
  - The Messages web page appears.
- Review the public messages.
3.0 Viewing Market Results

3.1 Overview

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. The focus of this section is viewing public information. Viewing private generation and demand information is presented in later sections.

Energy Market Results and Ancillary Services Market Results are markets information that are available to anyone that visits the PJM Markets Gateway web site. Energy Market Results includes Day-Ahead Market prices, Day-Ahead binding transmission constraints, Day-Ahead net tie schedules and Day-Ahead reactive interface limits. Ancillary Market Results includes Regulation requirement, Regulation procured, Synchronized Reserve Markets requirements, Tier1 estimate, and Tier2 procured.

- **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.
- **Regulation Results** – Use this web page to view the results of the Regulation Market.
- **Synchronized Reserve Results** – Use this web page to view the results of the Synchronized Reserve Market.
- **Primary Reserve Results** – Use this web page to view the results of the Primary Reserve Market.
- **Day-Ahead Scheduling Reserve Results** – Use this web page to view the results of the Day-Ahead Scheduling Reserve Market.

3.2 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.

- **Day-Ahead Scheduling Reserve Objective for area: DOM** – The total Scheduling Reserve Objective, in MW, calculated based on the Day-Ahead demand for the Dominion subzone.

- **Day-Ahead Scheduling Reserve Objective for area: RFC** – The total Scheduling Reserve Objective, in MW, calculated based on the Day-Ahead demand for the Reliability First Corporation control area.

**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
- Day-Ahead Scheduling Reserve Objective for area: DOM
- Day-Ahead Scheduling Reserve Objective for area: RFC

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

*The file is downloaded to your local directory.*

### 3.3 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 local directory.

### 3.4 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.
3.5 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 local directory.

3.6 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 the each interface for each hour. To download selected information, click the XML or CSV report buttons. The file is downloaded to your local directory.

3.7 View Regulation Market Clearing Results

A public user can view the Regulation Market clearing results for the Regulation Market.

Regulation Results for Date/Area

The following Regulation Market results information is posted:

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 D Self Scheduled Effective MW – Self-scheduled regulation D market capability.

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

Reg D Procured Effective MW – Total procured regulation D capability.

Reg A Procured Effective MW – Total procured regulation A 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 hour.

Reg A Mileage – 30 day average of ΔMW/MW for an ideal resource following Reg A.

Reg D Mileage – 30 day average of ΔMW/MW for an ideal resource following Reg D.

Steps (from the left navigation bar):

Select Public.

Select Market Results Ancillary Services.

Select the Regulation Results tab. The Regulation Results web page appears.

Select the desired control area (currently there is only one regulation area).

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

The file is downloaded to your local directory.

If there is no Regulation Market Assigned MW posted to Markets Gateway for an hour, PJM will continue with assignments from the last approved hour before the missing hour, adjusting as needed. The real-time hourly integrated Regulation clearing price will be used for settlements.

### 3.8 View Synchronized Reserve Market Clearing Results

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

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

**Tier-1 Est. Projected** – Estimated Synchronized Reserve Market Tier-1 MW capability.

**Avail. Transfer Projected** – MW available for transfer

**Tier-2 Req. Projected** – Required Synchronized Reserve Market Tier-2 MW capability.

**Tier-2 Self-Sched** – Self-Scheduled Synchronized Reserve Market Tier 2 MW capacity.

**Tier-2 Assigned Preliminary** – Assigned Synchronized Reserve Market Tier 2 MW capability.

**Total Preliminary** – Total Amount of Estimated Tier-1 Synchronized Reserve capability, Tier-2 Self-Scheduled Synchronized Reserve capability and Assigned Tier-2 Synchronized Reserve capability

**Deficiency Preliminary** – Synchronized Reserve Market deficiency

**Steps (from the left navigation bar):**

Select Public.

Select Market Results Ancillary Services.

Select the Synchronized Reserve Results tab.

The Synchronized Reserve Results web page appears.
Select the desired reserve area or sub-zone.

Click the Market Day calendar to select the date.

Click the **Refresh** button.

*The synchronized reserve results appear for the selected date.*

Review the following Synchronized Reserve market results for each hour:

- Hour
- Requirement
- Tier-1 Est. Projected
- Avail. Transfer Projected
- Tier-2 Req. Projected
- Tier-2 Self-Sched.
- Tier-2 Assigned Preliminary
- Total Preliminary
- Deficiency Preliminary

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

*The file is downloaded to your local directory.*

### 3.9 View Primary Reserve Market Clearing Results

A Markets Gateway user can view the Primary Reserve estimates. The title reflects date selected:

**Primary Reserve Results for Date/Area**

The following Primary Reserve estimates information is posted:

- **Requirement** – The total required amount of 10-minute reserve that must be synchronized to the grid.
- **Tier-1 Est. Projected** – Estimated Synchronized Reserve Market Tier-1 MW capability.
- **Tier-2 Self-Scheduled** – Self-Scheduled Synchronized Reserve Market Tier 2 MW capacity.
- **Avail. Transfer Projected** – Available MWs for Primary Reserve.
- **Tier-2 Assigned Preliminary** – Assigned Synchronized Reserve Market Tier 2 MW capability.
- **Non-Sync Reserve Est. Projected** – MWs of resources not electrically synchronized to the grid, but can be available within 10 minutes.
- **Total Preliminary** – Total Amount of Estimated Tier-1 Synchronized Reserve capability, Tier-2 Self-Scheduled Synchronized Reserve capability and Assigned Tier-2 Synchronized Reserve capability
- **Deficiency Preliminary** – Primary Reserve deficiency

**Steps (from the left navigation bar):**

- Select **Public**.
- Select **Market Results Ancillary Services**.
Select the **Primary Reserve Results** tab.

*The Primary Reserve Results web page appears.*

Select the desired reserve area or sub-zone either MAD Region or PJM.

Click the Market Day calendar to select the date.

Click the **Refresh** button.

*The primary reserve results appear for the selected date.*

Review the following Primary Reserve market results for each hour:

- **Hour**
- **Requirement**
- **Tier-1 Est. Projected**
- **Tier-2 Self-Scheduled**
- **Avail. Transfer Projected**
- **Tier-2 Assigned Preliminary**
- **Non-Sync Reserve Est. Projected**
- **Total Preliminary**
- **Deficiency Preliminary**

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

*The file is downloaded to your local directory.*

### 3.10 View Day-Ahead Scheduling Reserve Market Clearing Results

A Markets Gateway user can view the DA Scheduling Reserve Market clearing results for the DA Scheduling Reserve market.

The following DA Scheduling Reserve Market results information is posted:

- **DASRMCP** – Day-Ahead Scheduling Reserve Market clearing price (DASRMCP) for each hour.
- **Procured** – MWs procured for DASR.
- **Required** – MWs required for DASR.

**Steps (from the left navigation bar):**

Select **Public** button.

Select **Market Results Ancillary Services**.

Select the **Day-Ahead Scheduling Reserve Results** tab.

*The Day-Ahead Scheduling Reserve Results web page appears.*

Select the desired reserve area or sub-zone (Currently, the only selection is PJM RTO.)

Click the Market Day calendar to select the date.
The Day-Ahead Scheduling reserve results appear for the selected date.

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

- Hour
- DASRMCP
- Procured
- Required

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

*The file is downloaded to your local directory.*
4.0 Managing Generation Portfolios

4.1 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 is 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

4.2 Which Web Pages Do I Use?

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

**Portfolios** – use to view existing generation portfolios and to create, update and delete generation portfolios.

4.3 View Existing Generation Portfolios

Data is filtered by generation portfolio on all the Generation web pages.

You can determine the generating units that are currently defined for a portfolio by viewing any of these web pages and viewing the Units List.

**Steps (from the left navigation bar):**

- Select any of the **Generator** web pages.
- Select the desired portfolio from the Portfolio list.
  
  *The generating units for the selected portfolio appear in the Location list.*
- Review the defined generating for the selected portfolio.

4.4 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):

Select System Utilities.

Select the Portfolios tab.

The Portfolios web page appears.

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

Click the Create button.

The New Portfolio pop-up text box displays.

Key in the new portfolio’s name 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 Generating Unit to Generation Portfolio.

4.5 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):

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 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.
4.6 Delete a Generation Portfolio

A generation user can delete an entire generation portfolio or a generating unit within a portfolio. To delete a generation portfolio, all units “assigned” to the portfolio must be removed.

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.

4.7 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):

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 disappear and the generating unit is deleted.
Select the Refresh button to verify modifications.
5.0 Viewing Private Generation Information

5.1 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.

5.2 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.

5.3 View Day-Ahead Generation Schedules & LMPs

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”.

**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 **Results** tab.
   
   *The Generator Market Results 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.
Click the **Refresh** button.

*The selected Operating Day's Day-Ahead generation schedules & LMPs will appear.*

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 local directory.*

### 5.4 View Lambda Generation Details

A generation user can view the Lambda generation details for the current day for each generating unit under their control. Data is displayed and updated on this page, every time a UDS case is approved by PJM dispatch during real-time operations.

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
- **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
- **Tier-1 MW** – The Synchronized Reserve Market Tier 1 MW
- **Tier-2 MW** – The Synchronized Reserve Market Tier 2 MW
- **DGPSR** – The Degree of Generator Performance for Synchronized Reserve
- **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.*

   Select the desired portfolio from the Portfolio List.
Review the following information for each generating unit:

- Location
- Schedule
- Lambda
- Gen MW
- Non-Ramp MW
- Reg MW
- Deviation MW
- Econ Min
- Econ Max
- Capacity Max
- Tier 1 MW
- Tier 2 MW
- DGPSR
- Status

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

The file is downloaded to your local directory.

5.5 View Regulation and Reserve Award

A generation user can view the Regulation and 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.

**Reg A Offer MW** -- The amount of offered regulation A MW for the unit.

**Reg D Offer MW** -- The amount of offered regulation D MW for the unit.

**Tier-2 Offer MW** -- The amount of Synchronized Reserve Market Tier-2 MW offered.

**Self-Sched MW** -- The amount cleared for Reg A, Reg D, or Tier-2 Synchronized Reserve offered as self-scheduled MW. See Manual 11, Section 3.2.1 for details.

**Tier-1 Est MW** -- Estimated Synchronized Reserve Market Tier-1 MW capability.

**Tier-2 MW** -- The amount of cleared Synchronized Reserve Tier-2 MW.

**Reg A MW** -- The amount of cleared Reg A MW.

**Reg D MW** -- The amount of cleared Reg D MW.

**Reg TPS Results** -- Result of the three pivotal supplier test.

**Reg Price Offer Used** -- The regulation schedule, determined by TPS testing, used for regulation market clearing.
**Actual Hourly Performance** – The actual regulation performance score based on timeliness, accuracy and precision of response to regulation signal for the operating hour. This value will be populated for all hours even if Market Results are missing for that hour.

**Steps (from the left navigation bar):**

Select **Generator**.

Select **Market Results**.

Select the **Regulation & Reserve Award** tab.

*The Regulation & 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
  - Reg A Offer MW
  - Reg D Offer MW
  - Tier-2 Offer MW
  - Self-Sched MW
  - Tier-1 Est MW
  - Tier-2 MW
  - Reg A MW
  - Reg D MW
  - Reg TPS Result
  - Reg Price Offer Used
  - Actual Hourly Performance

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

*The file is downloaded to your local directory.*
6.0 Managing Unit Data

6.1 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.

6.2 Which Web Pages Do I Use?
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.

6.3 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 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 generating unit's identifier at a site or plant.

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

- **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 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.

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

- **Regulation Resource** – Indicates if the generating unit is a regulation resource.
**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

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

*The file is downloaded to your local directory.*

### 6.4 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. 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 operating limits supersede all other operating limits.

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

**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.

**Spin Max (MW)** – The maximum value, in MW, of output a Tier 1 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 Spin Maximum Limit. It must be higher than or equal to the economic maximum of the unit. 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.

**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:

- Emergency Min (MW)
- Emergency Max (MW)
- Economic Min (MW)
- Economic Max (MW)
- Spinning 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 local directory.*

### 6.5 Define Energy Ramp Rate by MW Segments

A generating unit's energy 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 energy ramp rate (entered on the Unit Detail web page).

A maximum of twenty MW ramp rate segments can be defined.

- 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 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 **Energy Ramp Rates** tab.

*The Energy 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 Item**.

*A new row appears on the web page.*

Enter data into the following fields:

- MW
6.6 Define Synchronized Reserve Ramp Rate by MW Segments

Synchronized Reserve Ramp Rates may be specified for Tier 1 resources and can be defined by MW ranges, or segments. A separate rate may be submitted for multiple segments of a unit’s MW range and these rates must be greater than or equal to the real time economic ramp rate(s) submitted for the unit. Synchronized ramp rates that exceed economic ramp rates must be justified via submission of actual data from past synchronized events to the PJM Performance Compliance department.

The following information is entered on the SyncRes Ramp Rates web page to define Synchronized Reserve ramp rate segments:

- **MW** – The MW output of the unit associated with this ramp rate segment.
- **Ramp Rate** – The synchronized reserve ramp rate in MW per minute at the unit MW output defined for this segment.

**Steps (from the left navigation bar):**

Select **Generator**.

Select **Unit**.

Select the **Synchronized Reserve Ramp Rates** tab.

*The Synchronized Reserve Ramp Rates web page appears.*

Click the Market Day calendar to select the date.

Select the desired portfolio from the Portfolio list.

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

Select the desired unit from the Location list.

*The synchronized ramp rate segment data for the selected unit appears on the web page.*

Right click to display short-cut menu.

Left click on **Add Item**.

*A new row appears on the web page.*

Enter the following data:

- **MW**
- **Ramp Rate**

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 local directory.

6.7 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:

- **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.

Only one status can be selected for a unit at a time.

**Steps (from the left navigation bar):**

1. Select **Generator**.
2. Select **Unit**.
3. Select the **Detail** tab.
   
   *The Unit Detail web page appears.*
4. Click the Market Day calendar to select the date.
5. Select the desired portfolio from the Portfolios list.
   
   *The list of generating units for the selected portfolio appears in the Location list.*
6. Select the desired unit from the Location list.
   
   *The unit data for the selected location appears on the Unit Detail web page.*
7. Locate the Commit Status field in the Defaults section.
   
   *Dropdown box will is available with choices.*
8. Select one of the following fields:
   
   - Economic
   - Emergency
   - Must Run
   - Not Available
9. 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 local directory.

6.8 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. 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.
6.9 Self-schedule a Generating Unit and Ignore 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 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. 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):**

1. Select **Generator**.
2. Select **Unit**.
3. Select the **Detail** tab.
   
   The **Unit Detail web page appears**.

4. Click the Market Day calendar to select the date.
5. Select the desired portfolio from the Portfolio list.
   
   The generating units for the selected portfolio appear in the **Location list**.

6. 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**.

7. Select a ‘Must Run’ Default Commit Status.

8. 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 local directory.

**6.10 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 local directory.

**6.11 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.*
7.0 Managing Unit Startup & No Load Data

7.1 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.

7.2 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.

7.3 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 1030 hours March 31 for the period April 1 through September 30 and on or before 1030 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 1030 hours March 31, for period April 1 through September 30.
- **Period 2** – The open enrollment for Period 2 is on or before 1030 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 enrollment 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 local directory.

### 7.4 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 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 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):**

1. Select Generator.
2. Select Schedules.
3. 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 local directory.

7.5 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 local directory.

7.6 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 local directory.

7.7 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 outlines 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:

Cold Startup Cost ≥ Intermediate Startup Cost ≥ 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 local directory.

### 7.8 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 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 local directory.

### 7.9 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 7.8 of this guide. The following rules apply to entering Startup and notification data:

- Hot to Cold Time ≥ Hot to Intermediate Time
- Cold Notification Time ≥ Intermediate Notification Time ≥ Hot Notification Time
- Cold Startup Time ≥ Intermediate Startup time ≥ 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 \(\rightarrow\) 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 local directory.
8.0 Managing Condenser Data

8.1 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.

8.2 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.

8.3 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 labeled **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 local directory.*
8.4 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 labeled **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 local directory.*

8.5 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:

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

**Condense 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 Gen 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.

**Steps (from the left navigation bar):**

1. Select **Generator**.
2. Select **Unit**.
3. Select the **Detail** tab.
   
   *The Unit Detail web page appears.*
4. Click the Market Day calendar to select the date.
5. Select the desired portfolio from the Portfolio list.
   
   *The generating units for the selected portfolio appear in the Location list.*
6. Select the generating unit from the Location list.
   
   *The data for the selected generating unit appears on the Unit Detail web page.*
7. Scroll vertically to the **Condense** section of the page.
8. Enter the desired changes to the following constraint data:
   - Notification Time
   - Energy Usage
   - Startup Cost
   - To Generation Cost
   - Hourly Cost
9. Click the **Save** button.
   
   *“Success: Save successful” message is displayed.*
10. To download selected information, click the XML or CSV report buttons.

   *The file is downloaded to your local directory.*

**8.6 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 Notification** — 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 labeled 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 local directory.

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:
   o Extended Cold Notification Time
   o Reason
- Extended Code 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 local directory.*
9.0 Managing Generating Unit Schedules

9.1 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

9.2 Which Web Pages Do I Use?
The following web pages are used to view and manage generating unit schedules:

- **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.
- **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.
- **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.
- **Selection** – Use this web page to select generating unit schedules.
- **Restriction Information** – Use this web page to communicate restrictions that may limit run time and dual fuel availability parameters.
- **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.
- **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.

9.3 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.

**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.

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

- 1-9 – 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.
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 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:

- 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 local directory.*

---

9.4 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.

**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):**

1. Select Generator.
2. Select Schedules.
3. Select the Manager tab.
   
   *The Schedules Manager web page appears.*
4. Click the Market Day calendar to select the date.
5. Select the desired portfolio from the Portfolio list.
   
   *The generating units for the selected portfolio appear in the Location list.*
6. Select the generating unit from the Location list.
   
   *The existing schedule types for the selected generating unit display on the Manager web page.*
7. Double click on the Schedule to be modified.
   
   *The selected schedule line is available for modifications.*
8. On the selected schedule line, modify text in either of the following fields:
   
   - Schedule Name
   - Schedule Description
9. 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 local directory.*

### 9.5 Delete a Schedule Type

After a schedule type is created, you can delete it from the Markets database.

**Steps (from the left navigation bar):**

1. Select Generator.
2. Select Schedules.
3. Select the Manager tab.
   
   *The Schedules Manager web page appears.*
4. 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 Manager web page.*

Click on the line with the schedule to be deleted.

Right click to display the Remove Item action button.

Left click on Remove Item to delete the schedule 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 local directory.*

### 9.6 Modify Schedule Operating Limits

The Schedule Detail web page presents the 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 local directory.*

### 9.7 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 hours at >0 MW output. 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 before it needs to be shut down, calculated as difference between the time the unit is put on-line to the time the unit is shut down. In the Day-Ahead Scheduling process, it is calculated at the maximum number of hours a unit is producing >0 MW output. 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 local directory.*

9.8 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.

Cost-based schedules for units with either cost-based or price-based Startup and No Load costs can create hourly Detail Updates. Price-based schedules for units with cost-based Startup and No Load costs can create hourly Detail Updates. Price-based schedules for units with 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.

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

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 local directory.*
9.9 Create Operational Restriction and Communicate Dual Fuel Availability

The Schedule Restriction Info web page allows users to communicate any restrictions, on a schedule basis, that may limit runtime (hours). 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 Restrictions 1-3** – The following pre-defined restrictions – Demineralized Water, Emissions and Fuel

**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.

**Hours at Full Load Remaining (over next 7 days)** – The worst case number of hours (least) the unit can run at full load based on the various restrictions. The default value is 168 hours (the full 7 days) and should be decremented from that value for the restrictions (minimum value is 0)

**Steps (from the left navigation bar):**

Select Generator.

Select Schedules.

Select the **Restriction Information** 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 restriction info for the selected schedule appears.*

Modify the Schedule Restriction Info as follows:

- Select Values for Operational Restriction Type 1-3 (as needed) from the dropdown list.
- 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).
- Decrement the Hours at Full Load Remaining (Over next 7 days)

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 local directory.

9.10 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.
9.11 Create Daily Schedule Offers

Schedule offers curve consists of MW/price segments. Up to ten 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 of 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):**

1. Select **Generator**.
2. Select **Schedules**.
3. Select the **Offers** tab.
   
   *The Schedules Offers web page appears.*
4. Click the Market Day calendar to select the date.
5. Select the desired portfolio from the Portfolio list.
   
   *The generating units for the selected portfolio appear in the Location list.*
6. Select the generating unit from the Location list.
7. Select the schedule from the Schedule list.
   
   *The data for the selected unit schedule appears on the Schedule Offers web page.*
8. Right click to display the **Add Item** action button.
9. 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 local directory.*

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.*

### 9.12 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:

<table>
<thead>
<tr>
<th>Day-Ahead</th>
<th>Re-Bid</th>
<th>Real Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Offers Screen</td>
<td>Offers Screen</td>
<td>Offers Screen</td>
</tr>
<tr>
<td>Submit offer for operating day</td>
<td>No changes can be made</td>
<td>No changes can be made</td>
</tr>
<tr>
<td>Offer Updates Screen</td>
<td>Offer Updates Screen</td>
<td>Offer Updates Screen</td>
</tr>
<tr>
<td>Submit hourly differentiated offers (MW and Price)</td>
<td>Can make hourly updates to the offer (Price only for committed hours; MW and Price for uncommitted hours)</td>
<td>Can make hourly updates to the offer (Price only)</td>
</tr>
</tbody>
</table>

The Day-Ahead market closes at 1030. 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 local directory.*

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 local directory.*

### 9.13 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):**

1. Select Generator.

2. Select Schedules.

3. Select the **Selection** tab.

   *The Schedules Selection web page appears.*

4. Click the Market Day calendar to select the date.

5. Select the desired portfolio from the Portfolio list.

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

6. Select the generating unit from the Location list.

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

7. Locate and click in the Availability column of the row with the Schedule to be selected.

8. Click in the check box to modify the Availability of the Schedule.

9. Click the **Save** button.

   “Success: Save successful” message is displayed.

   *The row will display with the modified Availability.*

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

   *The file is downloaded to your local directory.*

**9.14 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 local directory.*

### 9.15 TPS Test Schedule Switching in Real Time

An hourly TPS test is conducted every hour to mitigate market power. If a supplier fails the test, all units associated with the supplier are offer capped at the cheaper of the price-based or cost-based offer. With hourly differentiated offers and hourly updates to energy offers, the test is conducted every hour for all online, offline, and self-scheduled units. This screen provides the participant insight into whether the schedule that the unit was committed on has switched due to the results of 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 local directory.*
10.0 Parameter Limited Schedules

10.1 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)

10.2 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

10.3 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 Downtime (hour)** – The submitted Minimum Down Time may not exceed the defined Minimum Down Time for the unit, unless an exception is granted.

**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. This parameter limit applies only to Capacity Performance resources from DY 2016 to DY 2018.
**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. This parameter limit applies only to Capacity Performance resources from DY 2016 to DY 2018.

**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. This parameter limit applies only to Capacity Performance resource from DY 2016 to DY 2018.

**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. This parameter limit applies only to Capacity Performance resources from DY 2016 to DY 2018.

**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. This parameter limit applies only to Capacity Performance resources from DY 2016 to DY 2018.

**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. This parameter limit applies only to Capacity Performance resources from DY 2016 to DY 2018.

**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. This parameter limit applies only to Capacity Performance resources from DY 2016 to DY 2018.

### 10.4 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
To download selected information, click the XML or CSV report buttons.

The file is downloaded to your local directory.

10.5 Submit Exception Parameter Limits

The Exception Parameter Limits web page is used to submit a parameter limit temporary exception or Real Time Values 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 daily exception is as follows:
  - By 10:30 am prior to the close of DAM
  - Initial Deadline to request a parameter exception that will begin the next operating day
  - PLS Schedules (both Price & Cost) will be revised in Markets Gateway to change the parameter limit for the next operating day
  - Temporary Exception Requests or Real Time Values request should be submitted via Markets Gateway
  - 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.

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.

**Start Date** – The start date of the exception request

**End Date** – The end date of the exception request

**Request Type** – The request type can be either ‘Daily’ for Temporary Exception or ‘Real Time Values’ request

**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.

**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.

**Max Runtime (hour)** – The submitted Maximum Runtime may not be less than the defined Maximum Runtime for the unit, unless an exception is granted. This parameter limit applies only to Capacity Performance resources from DY 2016 to DY 2018.

**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.

**Justification** – Submitted by generation to justify a temporary exception to the unit’s parameters

**Status** – A status of an exception request may be Pending, Approved, Denied and 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. This parameter limit applies only to Capacity Performance resources from DY 2016 to DY 2018.

**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. This parameter limit applies only to Capacity Performance resources from DY 2016 to DY 2018.

**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. This parameter limit applies only to Capacity Performance resources from DY 2016 to DY 2018.

**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. This parameter limit applies only to Capacity Performance resources from DY 2016 to DY 2018.

**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. This parameter limit applies only to Capacity Performance resources from DY 2016 to DY 2018.
**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. This parameter limit applies only to Capacity Performance resources from DY 2016 to DY 2018.

**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 Downtime
- Min Runtime
- Max Runtime
- Max Daily Starts
- Max Weekly Starts
- Turn Down Ratio
- Justification
- eDart Ticket
- Cold Startup Time
- Intermediate Startup Time
- Hot Startup Time
- Cold Notify Time
- Intermediate Notify Time
- Hot Notify Time

- 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.

To download selected information, click the XML or CSV report buttons.
The file is downloaded to your local directory.

10.6 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
- 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
To download selected information, click the **XML** or **CSV** report buttons.

*The file is downloaded to your local directory.*
11.0 Managing Regulation Data

11.1 Regulation Data Overview
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
- Submitting a regulation bilateral

The PJM Markets Gateway 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 regulating high and low limits.
- **Regulation Offer** – Use this web page to create regulation offers and modify the status of the regulation offer.
- **Regulation A Updates** – Use this web page to modify regulation A resources’ offers, availability and parameters on an hourly basis
- **Regulation D Updates** – Use this web page to modify regulation D resources’ offers, availability and parameters on an hourly basis
- **Regulation Bilateral Transactions** – use this web page to facilitate a regulation bilateral transaction.

11.3 Enter Regulation Limits
A regulation offer consists of the following data: regulation capability, regulation price, regulation maximum limit, regulation minimum limit and regulation status. If a resource is providing regulation and energy it may elect to enter a minimum Reduced Ramp Rate Floor Percent. Regulation limits are defined on a unit basis. The following regulating limits are entered on the Unit Detail

- **Regulation Max MW** – Maximum generation limit when unit is providing regulation. Value defaults to the economic high limit if left blank.
- **Regulation Min MW** – Minimum generation limit when unit is providing regulation. Value defaults to the economic low limit if left blank.
- **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 values) 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 Update screen, not the Unit Hourly Screen.

Maximum and minimum regulation limits fields appear only for generating units that have Regulating Capability, as defined in the primary unit characteristics. The maximum and minimum regulation limits also appear on the Regulation Offer web page, but cannot be modified.

**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 local directory.*

### 11.4 Submit Daily Regulation Offer

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 signal type (RegA or RegD) with one row representing a set of offers for a resource for each signal type. Resources that are qualified to follow either RegA or RegD may enter up to two rows for each day’s submissions. Please see Manual 15 for guidelines on 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.

**Type** – The regulation type (Reg A or Reg D). For a unit with both Reg A and Reg D offers, two rows will display.

**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 Offer must total to less than or equal to $100/MWh. Offers may not be negative.

**Performance Offer Price** – The performance 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 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 unit. Offers may not be negative. If a unit is available for regulation and no cost is entered, the cost will default to 0.0.
**Performance Offer Cost** – The performance cost at which regulation is offered for the unit. Offers may not be negative. If a unit is available for regulation and no cost is entered, the cost will default to 0.0.

**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.

**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. The value should not be greater than the Offer MW.

**Availability** – Indicates availability of unit.

**Self-Scheduled** – Indicates the resource is self-scheduled for the day.

A regulation offer’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 100 operating hours. It is used to adjust the capability and performance offer. This field cannot be edited and is for awareness only.

The regulation limits for the unit are entered on the Unit Detail web page.

**Steps (from the left navigation bar):**

1. Select Generator.
2. Select **Regulation Market**.
3. 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:

- Reg Type
- Offer MW
- Capability Offer Price
- Performance Offer Price
- Capability Offer Cost
- Performance Offer Cost
- Heat Rate @ Eco Max
- Heat Rate @ Eco Min
- VOM Rate
- Fuel Cost
- Energy Storage Loss
- 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:

- 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 local directory.

11.5 Adjust Regulation Resource Availability

Regulation offers may be submitted for specific hours of the operating day. This task 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.
The default status of the Regulation Updates page displays “null” values in the MW, Regulation Min MW and Regulation Max MW columns. “Available” is displayed in the Available Status column.

Note: If a row on Regulation Updates page is not edited from the default status, the data on the Regulation Offers page prevails.

**Hour Ending** – Hour to be adjusted in Hour Ending.

**Reg. Min. MW** – Minimum generation limit when unit is providing regulation.

**Reg. Max. MW** – Minimum regulation amount that may be assigned.

**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.

**Min. Offer MW** – Minimum MW for assignment. The value should not be greater than the Offer MW.

**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:

- Regulation Min MW
- Regulation Max MW
- Spilling
- Reduced Ramp Rate (%)
- Min. Offer MW (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 local directory.*
11.6 Update Regulation A Hourly Offers

Regulation offers may be submitted for specific hours of the operating day. For resources following the Regulation A signal, this is accomplished by editing the Regulation A Updates page in Markets Gateway. The rows on the Regulation A Updates page that have been edited will serve as an over-write of the data on the Regulation Offers page. An offer must be submitted on the Regulation Offers page before hourly offers can be submitted on the Regulation A Updates page. All hourly updates must be made at least 65 minutes prior to the start of the operating hour.


Note: If a row on Regulation Updates page is not edited from the default status, the data on the Regulation Offers page prevails.

In Real-Time, if a unit chooses to opt out of hourly offer updates, the Regulation A Capability Offer Price and Cost & Regulation A Performance Offer Price and Cost columns will be locked out at the close of the Re-Bid period and throughout the operating day. Regulation A MW values are still able to be updated up to 65 minutes before the top of the operating hour.

A regulation A hourly offer consists of the following pieces of data:

**Hour Ending** – Hour to be adjusted in Hour Ending.

**Reg. A MW** – MWs the resource can provide while following RegA.

**Reg. A Self-Scheduled** – Self-scheduled MWs a resource can provide while following RegA.

**Reg. A Commit Status** – Indicates the availability of resource to follow RegA.

**Reg. A 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 Offer must total to less than or equal to $100/MWh. Offers may not be negative.

**Reg. A Performance Offer Price** – The performance 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 Offer must total to less than or equal to $100/MWh. Offers may not be negative.

**Reg. A Capability Offer Cost** – The capability cost at which regulation is offered for the unit. Offers may not be negative. If a unit is available for regulation and no cost is entered, the cost will default to 0.0.

**Reg. A Performance Offer Cost** – The performance cost at which regulation is offered for the unit. Offers may not be negative. If a unit is available for regulation and no cost is entered, the cost will default to 0.0.

**Steps (from the left navigation bar):**

Select Generator.

Select Regulation Market.

Select the Regulation A Updates tab.

The Regulation A 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 A MW
- Reg A Self-Scheduled
- Reg A Commit Status
- Reg A Capability Offer Price
- Reg A Performance Offer Price
- Reg A Capability Offer Cost
- Reg A Performance 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 local directory.

11.7 Update Regulation D Hourly Offers

Regulation offers may be submitted for specific hours of the operating day. For resources following the Regulation D signal, this is accomplished by editing the Regulation D Updates page in Markets Gateway. The rows on the Regulation D Updates page that have been edited will serve as an over-write of the data on the Regulation Offers page. An offer must be submitted on the Regulation Offers page before hourly offers can be submitted on the Regulation D Updates page. All hourly updates must be made at least 65 minutes prior to the start of the operating hour.

The default status of the Regulation D Updates page displays “null” values in the Reg D MW, Reg D Self Scheduled, Reg D Capability Offer Price, Reg D Performance Offer Price, Reg D Capability Offer Cost and Reg D Performance Offer Cost columns. “Not Available” is displayed in the Reg D Commit Status column.

Note: If a row on Regulation Updates page is not edited from the default status, the data on the Regulation Offers page prevails.

In Real-Time, if a unit chooses to opt out of hourly offer updates, the Regulation D Capability Offer Price and Cost & Regulation D Performance Offer Price and Cost columns will be locked out at the close of the Re-Bid period and throughout the operating day. Regulation D MW values are still able to be updated up to 65 minutes before the top of the operating hour.

A regulation D hourly offer consists of the following pieces of data:

**Hour Ending** – Hour to be adjusted in Hour Ending.

**Reg. D MW** – MWs the resource can provide while following RegD.

**Reg. D Self-Scheduled** – Self-scheduled MWs a resource can provide while following RegD.

**Reg. D Commit Status** – Indicates the availability of resource to follow RegD.
**Reg. D 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 Offer must total to less than or equal to $100/MWh. Offers may not be negative.

**Reg. D Performance Offer Price** – The performance 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 Offer must total to less than or equal to $100/MWh. Offers may not be negative.

**Reg. D Capability Offer Cost** – The capability cost at which regulation is offered for the unit. Offers may not be negative. If a unit is available for regulation and no cost is entered, the cost will default to 0.0.

**Reg. D Performance Offer Cost** – The performance cost at which regulation is offered for the unit. Offers may not be negative. If a unit is available for regulation and no cost is entered, the cost will default to 0.0.

**Steps (from the left navigation bar):**

1. Select **Generator**.
2. Select **Regulation Market**.
3. Select the **Regulation D Updates** tab.
   
   *The Regulation D Updates web page appears.*

4. Click the Market Day calendar to select the date.
5. Select the desired portfolio from the Portfolio list.
   
   *The generating units for the selected portfolio appear in the Location list.*

6. 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 D MW
- Reg D Self Scheduled
- Reg D Commit Status
- Reg D Capability Offer Price
- Reg D Performance Offer Price
- Reg D Capability Offer Cost
- Reg D Performance 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 local directory.*

**11.8 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 1330 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 labeled 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 local directory.*

**11.9 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 local directory.

**11.10 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 local directory.
12.0 Managing Synchronized Reserve Data

12.1 Synchronized Reserve Data Overview
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 Tier 2 resources
- The PJM Markets Gateway 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:

- **Unit Detail** – Use this web page to enter Synchronized Reserve maximum limit for Tier 1 resources.
- **Synchronized Reserve Market Offers** – Use this web page to create Synchronized Reserve offers for Tier 2 resources and modify the status of the 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.

12.3 Enter Synchronized Reserve Limits
A Synchronized Reserve offer consists of the following data: amount of MWs offered for Synchronized Reserve, Synchronized Reserve offer price, Synchronized Reserve maximum for Tier 1 resources and Synchronized Reserve status. Synchronized Reserve limits are defined on a unit basis. The following Synchronized Reserve limits are entered on the Unit Detail:

**Synchronized Max (MW)** – The maximum value, in MW, of output a Tier 1 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 higher than or equal to the economic maximum of the unit. The default value is 0.0 MW.

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 (Spin Max) field also appears on the Synchronized Reserve Update web page. The value on this page can be lesser than the economic maximum for a qualified unit that has been granted exception due to its physical limitation.

**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 (Spinning 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 local directory.

12.4 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 if the unit is either Available or Self-Scheduled to provide Synchronized Reserve.

- **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 unit’s O & M cost (as determined by the Cost Development Subcommittee) plus $7.50/MWh margin.

- **Condense Energy Use** – This is the amount of energy a condensing unit consumes in an hour while operating in the condensing mode.

- **Condense Startup Cost** – This is the actual cost associated with getting a unit from a completely off-line state into the condensing mode including fuel, O&M, etc.

- **Condense to Generate 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.

- **Full Heat Rate** – The heat rate of the unit, specified in BTU/kWh, when the unit is at full load.

- **Reduced Heat Rate** – The heat rate of the unit, specified in BTU/kWh, when the unit is at reduced load.

- **VOM Rate** – The variable operating and maintenance expense rate, in dollars, of operating and maintenance costs.

- **Spin As Condenser** – Used to identify if a combustion turbine can be committed for Synchronized Reserve as a condenser.
- Yes – Indicates the unit may clear Tier-2 Synchronized Reserve either from an offline state or online in condensing mode. The unit will not be considered for Tier-2 when it is online generating.
- No – Indicates the unit may clear for Tier-2 only when it is online generating and the Economic Min is not equal to Economic Max; that is, the unit has a dispatchable range.

- Condense Available Status – Used to indicate if a unit can be committed to condense for voltage support. This data, despite being on the Synchronized Reserve page, is not related to the Synchronized Reserve Market.
  - Available – Indicates the unit is available to condense for transmission voltage support.
  - Not Available – Indicates the unit is unavailable to condense for transmission voltage support.

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
- Condense Energy Use
- Condense Startup Cost
- Condense to Generate Cost
- Full Heat Rate
- Reduced Heat Rate
- VOM Rate
- Spin As Condenser
- Condense 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 local directory.
12.5 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 65 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, Spin Max and Self Scheduled MW columns. “Available” is displayed in the Availability 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.

- **Hour** – Time of change in hour ending.
- **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 if the unit is either Available or Self-Scheduled to provide Synchronized Reserve.
- **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 unit’s O & M cost (as determined by the Cost Development Subcommittee) plus $7.50/MWh margin.
- **Spin Max** – Max MW for a Synchronized Reserve event.
- **Availability** – Status of the resource.
- **Self-Scheduled MW** – MW self-scheduled for Synchronized Reserve.

A synchronized 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
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 local directory.*
12.6 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 regulation bilateral transactions. The seller confirms the transaction. All data must be entered no later than 1330 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.
- **Percent** – Indicates the percentage of purchaser's Synchronized Obligation in the area or reserve zone offered for sale 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.
- **Sub-Zone** – A subset of an area with its own reserve requirement that must be enforced in addition to enforcing the area requirement.

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:

- MW
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 local directory.

12.7 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 in 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 local directory.
12.8 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 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 local directory.

12.9 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 regulation bilateral transactions. The seller confirms the transaction. All data must be entered no later than 1330 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.
- **Percent** – Indicates the percentage of purchaser’s Non Synchronized Obligation in the area or reserve zone offered for sale 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.

- **Sub-Zone** – A subset of an area with its own reserve requirement that must be enforced in addition to enforcing the area requirement.

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 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:

- MW
- %
- Start Date
- Hour
- Stop Date
- Hour
- Area
- Sub-Zone

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 local directory.*

**12.10 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):**

1. Select Bilaterals.
2. Select the Non-Synchronized Reserve Bilaterals tab. 
   *The Non-Synchronized Reserve Bilaterals web page appears.*
3. Click the Date drop down to select the Month and Year.  
   *The selected date's existing synchronized bilateral transactions appears.*
4. Select 'Yes' or 'No' from the Confirmation field drop down.  
   *The chosen selection is displayed in the field.*
5. 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 local directory.*

### 12.11 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):**

1. Select Bilaterals.
2. Select the Non-Synchronized Reserve Bilaterals tab. 
   *The Non-Synchronized Reserve Bilaterals web page appears.*
3. Click the Date drop down to select the Month and Year.  
   *The selected date's existing Non-Synchronized Reserve bilateral transactions appears.*
4. Right click on the bilateral transaction to be deleted.
5. Select the Remove Item action button.
6. 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 local directory.*
13.0 Managing Hourly Unit Data

13.1 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). All hourly updates can be made up to the end of the current operating hour.

13.2 Which Web Pages Do I Use?

The Operating Company uses the following web pages to submit hourly updates to PJM:

- **Unit Hourly Updates** – use this page to submit updated unit statuses and MW operating limits.
- **Regulation Updates** – use this page to submit updated regulation statuses and regulation limits.
- **Synchronized Reserve Updates** – use this page to submit updated Synchronized Reserve statuses and Synchronized Reserve limits.

13.3 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:

- **Hour** – A trading interval of one hour, identified by the time at the end of that hour.

- **Emergency 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.

- **Economic 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.

- **Economic 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.

- **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 overrides the Emergency Max Limit (entered on the Unit Detail and Schedule Details web pages) for this generating unit.
**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 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:

- 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 local directory.*

### 13.4 Revise the Status of a Generating Unit

During the Operating Day, the Operating Company can revise the status of the generating unit. The following information is 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.
Notification Time – This can override the daily scheduled, Hot, Cold, or Intermediate Notification Times. This parameter can only be changed during real-time operations. The default value is 0 hours.

The Operating Company can also use the Unit Hourly Updates web page to self-schedule a unit that does not have a unit status of must-run on the Unit Detail web page.

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:
   o Unavailable
   o Economic
   o Emergency
   o Must Run
Modify the following fields for the specific hours selected:
   o Fixed Gen
   o Notification 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 local directory.
14.0 Managing Demand Portfolios

14.1 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

14.2 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.

14.3 View Existing Demand Portfolios

Data is filtered by demand portfolio on many web pages, including:

- 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.

14.4 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.*

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.

### 14.5 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 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.

### 14.6 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):**

1. Select **System Utilities**.
2. Select the **Portfolios** tab.
   - *The Portfolios web page appears.*
3. Select and highlight the portfolio’s name in the Portfolio field.
4. Select the **Remove** button to delete the selected portfolio.
   - *The portfolio disappears from the Portfolio list.*
5. Click the **Save** button to delete the portfolio or click Refresh to retain the portfolio.
   - “Success: Save successful” message is displayed.

### 14.7 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):**

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 click in the center column.
   - *The row color will become highlighted.*
5. Locate the block of 4 single and double arrow buttons adjacent to the Location list.
6. Click on the right arrow button to remove a location from the Portfolio.
7. 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.*
15.0 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.

15.1 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.

15.2 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 local directory.*
16.0 Managing Demand Bids

16.1 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.

16.2 Which Web Pages Do I Use?

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

- **Distribution Factors** – 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

16.3 Update Distribution Factors

The EDC specifies the transmission zone, the bus distributions and the aggregate bus distributions, or aggregate factors, for the Day-Ahead market. The default for the transmission zone is PJM’s state estimator distribution, as determined at 8:00 a.m. one week prior to the Operating Day. The EDC can modify the default aggregate factors only after the state estimator populates the Markets Database.

The following information is presented on the Aggregate Factors web page:

- **Bus Node Location** – The name of the individual price node included in the aggregate node.
- **Factors** – The amount of electricity that is distributed to the price node. 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 tab.

The Distribution Factors 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

Click on the Bus Node Location row with the Factor to be revised.

A text entry box will display where the Factor is to be revised.

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 local directory.

16.4 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.

**MW** – Fixed demand bid, expressed in MW. The default is zero MW.

**Steps (from the left navigation bar):**

1. Select Demand.
2. Select the **Day-Ahead Demand Bids** tab.
   
   *The Day-Ahead Demand Bids web page appears.*
3. Click the Market Day calendar to select the date.
4. Select the desired demand portfolio from the Portfolios List.
   
   *The price nodes included in the portfolio appear in the Location List.*
5. Select the desired price node from the Location List.
6. Click the **Refresh** button.
   
   *The data for the selected location appears*
7. The **Demand Bid Limit for the corresponding zone appears.**
8. Click on the row with the hour for which the bid is to be submitted.
9. Enter the bid in the text box which opens in the Fixed Demand field.
10. Click the **Save** button.

   *“Success: Save successful” message is displayed.*
11. 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:

1. Click on the row with the hour for which the bid is to be submitted.
2. Enter the bid in the text box which opens in the Fixed Demand field.
3. Right click to display the **Copy Hourly Block** action button.
4. Left click on **Copy Hourly Block.**
5. 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.*
6. Entry rows for all hours will appear.
7. Right click to display the **Paste Hourly Block** action button.
8. 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 Limit 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 local directory.

16.5 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.

There is a limit of nine segments for a price-sensitive demand bid.

**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 Limit for the corresponding zone appears.

Right click on the hour where the bid is to be entered to display the Add Item action button.

Left click on Add Item to open a Day-Ahead Demand Bid data entry line.

On the new Day-Ahead Demand Bid data entry line, enter the following:

- MW
- Price

Click the Save button.

“Success: Save successful” message is displayed.

If the total demand MW in any hour exceeds the Demand Bid Limit 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 local directory.

16.6 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 Limit for the corresponding zone appears.

Right click on the page that contains the bids to be copied.

Left click on the **Copy All** 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 Limit 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 local directory.
17.0 Managing Increment Offers & Decrement Bids

17.1 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, transmission zone, aggregate, or single bus for which PJM calculates an LMP. 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

17.2 Which Web Pages Do I Use?

The following web pages are used to view and manage increment offers and decrement bids:

- **Inc Offers** – Use this web page to submit increment offers.
- **Dec Bids** – Use this web page to submit decrement bids.
- **Virtual Market Results** – Use this web page to view cleared increment offers and decrement bids.

17.3 Submit Increment Offers

Increment offers look like spot market sales or dispatchable resources. An increment offer can be submitted for any PJM hub, transmission zone, aggregate, or single bus for which PJM calculates an LMP.

A valid increment offer consists of the following data being entered on the Inc/Dec web page:

- **Location** – Any PJM hub, transmission zone, aggregate, or single bus for which PJM calculates an LMP
- **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.

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 Item** action button.

Select **Add Item**.

*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 local directory.*

### 17.4 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, transmission zone, aggregate, or single bus for which PJM calculates an LMP
- **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.

**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 Item** action button.

Select **Add Item**.

*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 local directory.*

### 17.5 View Cleared Increment Offers & Decrement Bids

Cleared increment offers and decrement bids are presented on the Demand 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):**

1. Select Virtual.
2. Select the **Market Results** tab.
   
   *The Virtual Market Results web page appears.*
3. Select the desired portfolio from the Portfolio List.
   
   *The list of generating units included in the selected portfolio appears in the Location List.*
4. Click the Market Day calendar to select the date.
   
   *The selected Operating Day’s cleared virtual transactions & LMPs will appear.*
5. 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 local directory.*

### 17.6 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, transmission zone, aggregate, or single bus for which PJM calculates an LMP

**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 local directory.
18.0 Managing Up-To Transactions

18.1 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 “OASIS Source/Sink List” located at http://www.pjm.com/markets-and-operations/etools/oasis/oasis-reference.aspx on PJM website. Up-To-Transactions are supported in Day-Ahead Market only.

18.2 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.

18.3 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:


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 “OASIS Source/Sink List” located at:


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 local directory.*

### 18.4 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 put in by Market Participants.

**Cleared MWs** – The Cleared MWs for the corresponding Up-To-Transaction bid as selected from Transaction List.

**Source LMP** – Source LMP of the selected up-to-transaction bid.

**Sink LMP** – Sink LMP 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 local directory.*

### 18.5 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 local directory.*
19.0 Managing Load Response Portfolios

19.1 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 confirmed economic Load Response registrations registered beforehand in eLRS (eSuite). There is no limitation to the number of portfolios created; nor is there a limit to the number of Load Response registrations that can be "assigned" to a portfolio. Load Response registrations 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.

19.2 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.

19.3 View Existing Load Response Portfolios

Load Response portfolios are required in the Portfolio filter on all Markets Gateway pages for Demand Response. Users can determine the Locations in a portfolio by viewing any of these pages and viewing the Location list.

Steps (from the left navigation bar):

Select any of the Demand Response web pages:

Select the desired portfolio from the Portfolio list.

The load response resources for the selected portfolio appear in the Location List.

Review the defined load response resources in the Location list for the selected portfolio.

19.4 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 bidding. 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.*

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 Load Response Resource to Load Response Portfolio.

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### 19.5 Add Load Response Resource to Load Response Portfolio

A user can add Load Response registrations to existing portfolios. There is currently no limit to the number of Load Response registrations that can be assigned to a portfolio. A Load Response registration 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.

*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 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.*
19.6 Delete Load Response Portfolio

A user can delete an entire load response portfolio or a Load Response registration 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 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.

19.7 Delete a Load Response Resource from a Load Response Portfolio

A user can remove a load response resource 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 Portfolio field.
- The row will become highlighted.
- Select a load response resource by clicking 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 load response resource 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.
20.0 Managing Load Response Bids

20.1 Load Response Bid Overview
Demand Response participants may submit Real-Time and/or Day-Ahead Load Response bids and information such as Shutdown Costs, Notification Time and Minimum Downtime in Markets Gateway.

20.2 Which Web Pages Do I Use?
The following Demand Response web pages are used to view and manage Load Response bid data under the Demand Response submenu in the navigation bar:

- **Offer Curve Manager** – Use this web page to submit updated Schedule Names, Descriptions and Types.
- **Offers** – Use this web page to submit daily Load Response offer data (MW and price).
- **Offer Updates** – Use this web page to submit hourly Load Response offer data (MW and price).
- **Parameters** – Use this web page to submit updated periodic Load Response Shutdown Costs, Minimum Downtime and Notification Time data.
- **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 and hourly Shutdown Cost.
- **Market Results submenu – Results tab** - Use this web page to view the Day-Ahead awards for each Load Response location, as well as Day-Ahead LMPs for each hour.

20.3 Create/Update/Delete 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. The following Demand Response web pages are used:

- **Demand Response submenu – click on Offer Curve Manager tab** - Use this web page to submit updated 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 Portfolios List.

*The Load Response registrations included in the portfolio appear in the Location List.*
Select the desired Load Response location from the Location list.
Click the **Refresh** button.

*The data for the selected Load Response location appears.*

For Load Response Bids, enter the following information:

- Schedule Name
- Schedule Description
- Schedule Type (1 or 2)
  1. Day-Ahead (Day-Ahead Market)
  2. Balancing (Real-Time Market)
- Add, Delete, or Modify existing entries (2 schedules are allowed)

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 local directory.*

**20.4 Select a Schedule**

Users must select a schedule for daily 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 Portfolios List.

*The Load Response registrations included in the portfolio appear in the Location List.*

Select the desired Load Response location from the DSR Location List.

Click the **Refresh** button.

*The data for the selected Load Response location appears*

Enter the following data the Load Response location:

- Schedule Name
- Market Type
  - Allows the participant to select the following Market Types:
    1. Day-Ahead (Day-Ahead Market)
    2. Balancing (Real-Time Market)
    3. Both (Day-Ahead and Balancing)
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 local directory.*

### 20.5 Update Shutdown Costs of a Load Response location

Shutdown costs are expressed in dollars and represent the fixed cost associated with committing a Load Response location. Shutdown costs are optional and must be submitted for review to the PJM Market Monitor. 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 associated with committing 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 associated with committing 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):**

1. Select **Demand Response**.
2. Select the **Demand Response** submenu.
3. Select the **Parameters** tab.

   *The Demand Response Parameters web page appears.*

4. Click the Market Day calendar to select the date.
5. Select the desired portfolio from the Portfolios List.

   *The Load Response registrations included in the portfolio appear in the Location List.*

6. Select the desired Load Response location from the Location list.
7. Click the **Refresh** button.

   *The data for the selected Load Response location appears.*

For Load Response Bids, enter the following information:

- Period 1 Shutdown Cost ($)
- Period 2 Shutdown Cost ($)

8. Click the **Save** button.

   “Success: Save successful” message is displayed.

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

   *The file is downloaded to your local directory.*
20.6 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 bid 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 bid must be committed 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 Portfolios List.

*The Load Response registrations included in the portfolio appear in the Location List.*

Select the desired Load Response location from the Location list.

Click the **Refresh** button.

*The data for the selected Load Response location appears.*

For Load Response Bids, enter the following information:

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 local directory.*

20.7 Notification Time of a Load Response location

Notification time will be expressed as a number of hours representing the amount of advance notice required for a Load Response location to reduce load.

**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 Portfolios List.

The Load Response registrations included in the portfolio appear in the Location List.
Select the desired Load Response location from the Location list.
Click the **Refresh** button.

The data for the selected Load Response location appears.
For Load Response Bids, 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.

**20.8 Submit Daily Load Response Bids**

Users must submit daily bids for a specific MW curtailment (in minimum increments of 0.1 MW) and price.

A Load Response bid consists of the following data on the Markets Gateway Demand Response submenu, on the Offers tab:

- **MW** – The MW bid 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 Portfolios List.

*The Load Response registrations included in the portfolio appear in the DSR Location List.*
Select the desired Load Response location from the DSR Location List.
Select the desired Schedule from the Schedule List.
Click the **Refresh** button.

*The data for the selected Load Response location appears.*
Enter the following data for each Load Response location:

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

  The file is downloaded to your local directory.

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.

### 20.9 Submit Hourly Load Response Bids

Users can submit hourly bids for a specific MW curtailment (in minimum increments of 0.1 MW) and price.

An hourly Load Response bid consists of the following data on the Markets Gateway Demand Response submenu, on the Offer Updates tab:

- **MW** – The MW bid 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 Portfolios List.

  *The Load Response registrations included in the portfolio appear in the DSR Location List.*

Select the desired Load Response location from the DSR Location List.

Select the desired Schedule from the Schedule List.

Click the **Refresh** button.

  *The data for the selected Load Response location appears.*

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:
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)

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 local directory.

20.10 Submit Revised MW Operating Limits

Users may also override Daily and Hourly Offers by providing hourly operating parameters to reflect Real-Time changes. These hourly operating parameters can be updated on the Demand Response submenu on the Hourly Updates tab. Note that hourly operating parameters for Real-Time bids can be modified up to 65 minutes prior to the operating hour of the same market day. The following operating parameters can be updated in the Hourly Updates web page:

---

**Economic Min** – Lowest incremental MW reduction a Load Response location can achieve. User must always include non-null value for all hours available to participate in the market.

**Economic Max** – Largest incremental MW reduction a Load Response location can achieve. User must always include non-null value for all hours available to participate in the market.

**Commit Status**:

- **Economic** – Indicates whether a location is available for normal economic participation.
- **Unavailable** – Indicates whether the location is not available for energy or is available for Ancillary Service Market 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 bid 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. Notification time can be submitted starting 7 days in advance, up to 65 minutes prior to the start of the target hour (excluding lockout periods). These updates can only be used in the Re-Bid period and Real-Time. Hourly Notification Time updates override the daily schedule value of Notification time.

**Shutdown Cost** – Represents the fixed cost associated with committing a Load Response location. This can be updated up to 65 minutes prior to the start of the target hour under the following conditions: For committed hours, shutdown cost can decrease; for uncommitted hours, shutdown cost can increase or decrease.

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**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 Portfolios List.

*The Load Response registrations included in the portfolio appear in the Location List.*

Select the desired Load Response location from the DSR Location List.

Click the **Refresh** button.

*The data for the selected Load Response location appears.*

Enter the following data for each hour of each Load Response location:

- Economic Min
- Economic Max
- Commit Status: Unavailable or Economic. Note that Self-Scheduled is no longer an option.
- Minimum Downtime
- Notification Time
- 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 local directory.*

Note that entries into Hourly Updates is *required* for Load Response participation in the Ancillary Service Markets as well (see following sections for more information).

### 20.11 View Cleared Day-Ahead Load Response Bids

Cleared load response bids are presented on the Demand Response web page under the Market Results submenu. The following information is presented:

**Location** – the name of a Load Response registration that submits a bid to reduce the load they draw from the PJM system in advance of real time operations.

**MW** – The MW quantity scheduled to be curtailed by the Load Response location for each hour. If there is no reduction scheduled, the field is blank.

**Price** – LMP, in $/MW, at which the load shall be curtailed

**Steps (from the left navigation bar):**

1. Select **Demand Response**.
2. Select **Market Results** submenu.
3. 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 Portfolios List.

The load response registrations included in the portfolio appear in the Location List.

Select the desired Load Response location from the DSR Location List.

Click the Refresh button.

The data for the selected Load Response location appears.

Review the following information:

- Location
- MW
- Price

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

The file is downloaded to your local directory.
21.0 Managing Regulation Offers for Load Response Locations

21.1 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 and Hourly Updates including prices and availabilities
- Submitting a regulation bilateral

Please note that entries must also be made into Hourly Updates tab in the Demand Response submenu in order make a regulation bid (see Section 21 of this User Guide). The Economic Max minus the Economic Min on Hourly Updates must equal, at the very least, 2 times the regulation Offer MW (see below) for that hour in order to clear for that Offer MW for that hour.

21.2 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 regulation offers and modify the status of the regulation offer.
- **Updates** – Use this web page to modify regulation offers, resource availability, prices and MWs on an hourly basis.
- **Regulation Bilaterals** – Use this web page to facilitate a regulation bilateral transaction.

21.3 Submit Daily Regulation Offer

A regulation Daily Offer for a Load Response location consists of the following data: capability, price, offer MW, maximum MW, minimum MW 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 signal type (RegA or RegD) with one row representing a set of offers for a location for each signal type. Locations that are qualified to follow either RegA or RegD may enter up to two rows for each day’s submissions. 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.

**Reg Type** – The regulation type (Reg A or Reg D). For a location with both Reg A and Reg D offers, two rows will display. 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 0.0. Capability and Performance Offer must total to less than or equal to $100/MWh. Offers may not be negative.
Performance Offer Price – The performance 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 0.0. Capability and Performance 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 may not be negative. If a location is available for regulation and no cost is entered, the cost will default to 0.0. See Manual 15 for Guidelines on cost offers.

Performance Offer Cost – The performance cost at which regulation is offered for the location. Offers may not be negative. If a location is available for regulation and no cost is entered, the cost will default to 0.0. See Manual 15 for Guidelines on cost offers.

Reg Min MW – Minimum MW representing the bottom of the regulating range for the location.

Reg Max MW – Maximum MW representing the top of the regulating range for the location.

Note that the Max MW minus the Min MW ought to equal 2 times the Offer MW capability for that day or hour.

Min Offer MW – Minimum MW for assignment. The value should not be greater than the 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 100 hours. It is used to adjust the capability and performance 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 generating units for the selected portfolio appear in the Location list.
Select the location from the Location list.
Click the Refresh button.

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
- Capability Offer Price
- Performance Offer Price
Select one of the following regulating statuses for each offer:

- Availability
- Self-Scheduled

The following values cannot be edited on the screen or are for display only:

- Area
- Reg Type
- 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 local directory.

21.4 Revise Hourly Regulating Offer and Availability

Regulation offers may be submitted for specific hours of the operating day. This task 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.

The default status of the Regulation Updates page displays “null” values in the Reg A MW, Reg D MW, Regulation Min MW, Regulation Max MW and Self Scheduled columns. “Available” is displayed in the Available Status 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:

**Hour Ending** – A trading interval of one hour, identified by the time at the end of that hour. This field cannot be edited and is for awareness only.

**Reg Min MW** – Minimum MW representing the bottom of the regulating range for the location.

**Reg Max MW** – Maximum MW representing the top of the regulating range for the location.

Note that the Max MW minus the Min MW ought to equal 2 times the Offer MW capability for that day or hour.

**Reg A MW** – The amount of regulation A 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 A Self-Scheduled** – Designates the hourly Reg A offer as self-scheduled. This designation overrides the designations on the Offers Tab for this hour for this location.
**Reg A Available** – The availability status of regulation A for this hour for the Load Response location.

**Reg D MW** – The amount of regulation D 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 D Self-Scheduled** – Designates the hourly Reg D offer as self-scheduled. This designation overrides the designations on the Offers Tab for this hour for this location.

**Reg D Available** – The availability status of regulation D for this hour for the Load Response location.

**Reg. A 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 0.0. Capability and Performance Offer must total to less than or equal to $100/MWh. Offers may not be negative.

**Reg. A Capability Offer Cost** – The capability cost at which regulation is offered for the location. Offers may not be negative. If a location is available for regulation and no cost is entered, the cost will default to 0.0.

**Reg. A Performance Offer Price** – The performance 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 0.0. Capability and Performance Offer must total to less than or equal to $100/MWh. Offers may not be negative.

**Reg. A Performance Offer Cost** – The performance cost at which regulation is offered for the location. Offers may not be negative. If a location is available for regulation and no cost is entered, the cost will default to 0.0.

**Reg. D 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 0.0. Capability and Performance Offer must total to less than or equal to $100/MWh. Offers may not be negative.

**Reg. D Capability Offer Cost** – The capability cost at which regulation is offered for the location. Offers may not be negative. If a location is available for regulation and no cost is entered, the cost will default to 0.0.

**Reg. D Performance Offer Price** – The performance 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 0.0. Capability and Performance Offer must total to less than or equal to $100/MWh. Offers may not be negative.

**Reg. D Performance Offer Cost** – The performance cost at which regulation is offered for the location. If a location is available for regulation and no cost is entered, the cost will default to 0.0.

**Reg. Min. Offer MW** – Minimum MW for assignment. The value should not be greater than the 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 locations for the selected portfolio appear in the Location list.*
Select the Load Response location from the DSR list.

Click the **Refresh** button.

*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 A MW
- Reg A Self-Scheduled
- Reg A Available
- Reg D MW
- Reg D Self-Scheduled
- Reg D Available
- Reg A Capability Offer Price
- Reg A Capability Offer Cost
- Reg A Performance Offer Price
- Reg A Performance Offer Cost
- Reg D Capability Offer Price
- Reg D Capability Offer Cost
- Reg D Performance Offer Price
- Reg D Performance Offer Cost
- Reg Min Offer MW

Click the **Save** button.

*The new values will change to green when successfully submitted.*

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

*The file is downloaded to your local directory.*

Should a unit not wish to participate in the regulation market in any given hour on the operating day, both updates must be made at least 65 minutes prior to the operating hour in the Regulation Updates screen:

- Set Offer MW to zero
- Set Available status to Not Available

Should a resource's regulation operating parameters change after the regulation market closes for an hour, the following changes may be made through direct communication with the PJM Scheduling Coordinator:

- Resource Regulating Status
- Available to unavailable
21.5 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 1330 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.

Click the **Refresh** button.

*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.
21.6 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 local directory.*

21.7 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.

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 local directory.

21.8 View Regulation and Reserve Award

A Load Response location user can view the Regulation and Reserve award details for the current day for each Load Response location under their control.

The following generation information is presented for each Load Response location included in the selected portfolio:

Location – The name of the Load Response location.
Reg A Offer MW – The amount of regulation A MW offered for the resource.
Reg D Offer MW – The amount of regulation D MW offered for the resource.
Tier-2 Offer MW – The amount of Synchronized Reserve Market Tier-2 MW offered.
Self-Sched MW – The amount cleared for Reg A, Reg D, or Tier-2 Synchronized Reserve offered as self-scheduled MW. See Manual 11 Section 3.2.1 for details.
Tier-2 MW – The amount of cleared Synchronized Reserve Tier-2 MW.
Reg A MW – The amount of cleared Reg A MW.
Reg D MW – The amount of cleared Reg D MW.
Reg TPS Results – The result of the three pivotal supplier test.
Reg Price Offer Used – The regulation schedule, determined by regulation TPS testing, used for regulation market clearing

Actual Avg Hourly Performance – The actual regulation performance score based on timeliness, accuracy and precision of response to regulation signal. This value will be populated for all hours even if Market Results are missing for that hour.

Steps (from the left navigation bar):

Select Demand Response.
Select Market Results.
Select the Regulation & Reserve Award tab.

The Market Results Regulation & Reserve Award web page appears.

Click the Market Day calendar to select the date.
Select the desired portfolio from the Portfolio list.

*The resources for the selected portfolio appear in the Location list.*

Select the Load Response location from the Location list.

Click to select the Hour for which to display.

Click the **Refresh** button.

*The data for the selected Load Response location appears on the Regulation & Reserve Award web page.*

Select from the Hourly Values pulldown list the range of hours for which you wish to modify the operating limits.

*The list of Load Response locations included under the Operating Company’s Control appears.*

Review the following information for each resource:

- Location
- Reg A Offer
- Reg D Offer
- Tier-2 Offer MW
- Self-Sched MW
- Tier-2 MW
- Reg A MW
- Reg D MW
- Reg TPS Result
- Reg Price Offer Used
- Actual Avg Hourly Performance

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

*The file is downloaded to your local directory*
22.0 Managing Synchronized Reserve Offers for Load Response Locations

22.1 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 bid (see Section 21 of this User Guide).

22.2 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 for Tier 2 locations, modify the status of the Synchronized Reserve daily offer for load response locations and indicate if the location is a flexible Tier 2 load response location.

**Updates** – Use this web page to modify Synchronized Reserve offers for Tier 2 locations, location availability, offer price and parameters on an hourly basis.

**Synchronized Reserve Bilaterals** – Use this web page to facilitate Synchronized Reserve bilateral transactions.

22.3 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 $7.50/MWh.

**Available Status** – Indicates if the location is available or unavailable to provide Synchronized Reserve.

**Flexible** – A daily parameter that can be used to indicate if the demand response location should be considered for Tier 2 in the hour-ahead study (inflexible) or if it should be considered in the intra-hour study (flexible). The default value is “False”. Note that a demand response location must be approved in eLRS prior to using this feature.

- **True** – Indicates that the load response location is a flexible Tier 2 location.
- **False** – Indicates that the load response location is an inflexible Tier 2 location.

**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 generating locations for the selected portfolio appear in the Location list._

Select the generating location from the Locations list.

Click the **Refresh** button.

_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
- Offer Price
- Available Status
- Flexible

Click the **Save** button.

_The new values will change to green when successfully submitted._

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

_The file is downloaded to your local directory._

### 22.4 Revise Hourly Synchronized Reserve Offer and Availability

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 daily data on the Synchronized Reserve Offers page.

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.

- **Hour** – Time of change in hour ending.
- **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 $7.50/MWh.
- **Availability** – Status of the location.
- **Self-Scheduled MW** – MW portion of the Offer MW that is self-scheduled for Synchronized Reserve. Cannot exceed the Offer MW value.
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 generating locations for the selected portfolio appear in the Location list.

Select the generating location from the Locations list.

Click the Refresh button.

The data for the selected generating location appears on the Synchronized Reserve Market Updates web page.

Enter the following synchronized availability data:

- Offer MW
- Offer Price
- Availability
- Self-Scheduled 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 local directory.

22.5 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 1330 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.

**Percent** – Indicates the percentage of purchaser’s Synchronized Obligation in the area or reserve zone offered for sale 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.

**Sub-Zone** – A subset of an area with its own reserve requirement that must be enforced in addition to enforcing the area requirement.

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.

Click the Refresh button.

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:

- MW
- %
- Start Date Hour
- Stop Date Hour
- Area
- Sub-Zone

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 local directory.*

22.6 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 in 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.

Click the Refresh button.

*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 local directory.*

22.7 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.

Click the Refresh button.

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 local directory.

22.8 View Regulation and Reserve Award

A Load Response location user can view the Regulation and Reserve award details for the current day for each Load Response location under their control.

The following generation information is presented for each Load Response location included in the selected portfolio:

- **Location** – The name of the Load Response location.
- **Reg A Offer MW** – The amount of regulation A MW offered for the resource.
- **Reg D Offer MW** – The amount of regulation D MW offered for the resource.
- **Tier-2 Offer MW** – The amount of Synchronized Reserve Market Tier-2 MW offered.
- **Self-Sched MW** – The amount cleared for Reg A, Reg D, or Tier-2 Synchronized Reserve offered as self-scheduled MW.
- **Tier-2 MW** – The amount of cleared Synchronized Reserve Tier-2 MW.
- **Reg A MW** – The amount of cleared Reg A MW.
- **Reg D MW** – The amount of cleared Reg D MW.
- **Reg TPS Results** – The result of the three pivotal supplier test.
- **Reg Price Offer Used** – The regulation schedule, determined by regulation TPS testing, used for regulation market clearing.

**Actual Avg Hourly Performance** – The actual regulation performance score based on timeliness, accuracy and precision of response to regulation signal. This value will be populated for all hours even if Market Results are missing for that hour.

Steps (from the left navigation bar):

- Select Demand Response.
- Select Market Results.
- Select the Regulation & Reserve Award tab.

The Market Results Regulation & Reserve Award web page appears.
Click the Market Day calendar to select the date.
Select the desired portfolio from the Portfolio list.

The resources for the selected portfolio appear in the Location list.
Select the Load Response location from the Location list.
Click to select the Hour for which to display.
Click the Refresh button.

The data for the selected Load Response location appears on the Regulation & Reserve Award web page.
Select from the Hourly Values pulldown list the range of hours for which you wish to modify the operating limits.

The list of Load Response locations included under the Operating Company’s Control appears.
Review the following information for each resource:
  o Location
  o Reg A Offer
  o Reg D Offer
  o Tier-2 Offer MW
  o Self-Sched MW
  o Tier-2 MW
  o Reg A MW
  o Reg D MW
  o Reg TPS Result
  o Reg Price Offer Used
  o Actual Avg Hourly Performance

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

The file is downloaded to your local directory.
23.0 Managing Pseudo-Tie Transactions

23.1 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.

23.2 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.

23.3 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):**

1. Select Pseudo Tie Transaction.
2. Select the Input tab.
   
   *The Pseudo-Tie Transaction web page appears.*
3. Click the Market Day calendar to select the date.
4. Right-Click on a selected hour and click Add Segment.
5. Select the desired path from the path dropdown list.
6. 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.
7. Add segment(s) to desired hours.
8. 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:
  o ID
  o MW
  o Price

Click the Save button.

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

The file is downloaded to your local directory.

23.4 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:
  o Hour
  o Cleared MW
  o Source LMP
  o Sink LMP

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

The file is downloaded to your local directory.

23.5 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 local directory.*
24.0 Managing Transaction Thresholds

24.1 An overview of the 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 entry below the limit set.

24.2 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, inc offers and dec bids.

24.3 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 Inc Offers.
- **Dec Bid MW Threshold** – The MW quantity set as a threshold for all Dec Bids.

**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 local directory.*

24.4 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 local directory.
25.0 Downloading & Posting XML Files

25.1 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.

25.2 Which Web Pages do I Use?
The following web pages are used to transmit XML-formatted files:

- **Report Download** – Use this web page to download public files

- **Query Upload** – Use this web page to download XML files. File must file contain an XML Query Request document.

- **Submit Upload** – Use this web page to post XML files. File must contain an XML Submit Request document.

- **Query by Transaction Upload** – Use this web page to download XML files. File must contain an XML Query by Transaction Request document.

25.3 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:

- Binding Limits
- Demand Summary
- Interface Limits
- Market Prices
- Messages
- Net Tie Schedule
- Node List
- Regulation Results
- Synchronized 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 in the checkbox:

- Binding Limits
- Demand Summary
- Interface Limits
- Market Prices
- Messages
- Net Tie Schedule
- Node List
- Regulation Results
- Synchronized Reserve Results

To download selected report, click the XML button.

The file is downloaded to your local directory.

25.4 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 local directory.*

### 25.5 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 local directory.*

### 25.6 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 local directory.*

### 25.7 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 local directory.*

### 25.8 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 local directory.*
Revision History

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
Appendix: Opportunity Cost Calculator v2 Instructions

The following instructions describe, in a systematic format, how to use the Opportunity Cost Calculator Tool version 2 in the PJM Markets Gateway environment to calculate opportunity costs for Energy Market Opportunity Costs (EMOC) and Non-Regulatory Opportunity Costs (NROC) for generation units. PJM staff requests that any issues found in the calculator promptly be reported to the PJM markets hotline.

Energy Market Opportunity Cost (EMOC) shall mean the difference between (a) the forecasted cost to operate a specific generating unit when the unit only has a limited number of available run hours due to limitations imposed on the unit by Applicable Laws and Regulations (as defined in PJM Tariff) and (b) the forecasted future hourly Locational Marginal Price at which the generating unit could run while not violating such limitations. Energy Market Opportunity Cost therefore is the value associated with a specific generating unit's lost opportunity to produce energy during a higher valued period of time occurring within the same compliance period, which compliance period is determined by the applicable regulatory authority and is reflected in the rules set forth in PJM Manual 15. Energy Market Opportunity Costs shall be limited to those resources which are specifically delineated in Schedule 2 of the Operating Agreement.

Issue Tracking: Generator Cost Development: Opportunity Cost Calculation for Energy & Environmentally Limited Units

Non-Regulatory Opportunity Cost (NROC) shall mean the difference between (a) the forecasted cost to operate a specific generating unit when the unit only has a limited number of starts or available run hours resulting from (i) the physical equipment limitations of the unit, for up to one year, due to original equipment manufacturer recommendations or insurance carrier restrictions, (ii) a fuel supply limitation, for up to one year, resulting from an event of force majeure; and, (b) the forecasted future hourly Locational Marginal Price at which the generating unit could run while not violating such limitations. Non-Regulatory Opportunity Cost therefore is the value associated with a specific generating unit's lost opportunity to produce energy during a higher valued period of time occurring within the same period of time in which the unit is bound by the referenced restrictions and is reflected in the rules set forth in PJM Manual 15. Non-Regulatory Opportunity Costs shall be limited to those resources which are specifically delineated in Schedule 2 of the Operating Agreement.

Issue Tracking: Generator Cost Development: Other Opportunity Costs

When a generating unit can use NROC or EMOC: For a generating unit that is subject to operational limitations due to energy or environmental limitations imposed on the generating unit by Applicable Laws and Regulations (as defined in the PJM Tariff), the Market Participant may include in the calculation of its “other incremental operating costs” an amount reflecting the unit-specific Energy Market Opportunity Costs expected to be incurred. Such unit-specific Energy Market Opportunity Costs are calculated by forecasting Locational Marginal Prices based on future contract prices for electricity using PJM Western Hub forward prices, taking into account historical variability and basis differentials for the bus at which the generating unit is located for the prior three year period immediately preceding the relevant compliance period and subtract there from the forecasted costs to generate energy at the bus at which the generating unit is located, as specified in more detail in PJM Manual 15. If the difference between the forecasted Locational Marginal Prices and forecasted costs to generate energy is negative, the resulting Energy Market Opportunity Cost shall be zero. Notwithstanding the foregoing, a Market Participant may submit a request to PJM for consideration and approval of an alternative method of calculating its Energy Market Opportunity Cost if the standard methodology described herein does not accurately represent the Market Participant’s Energy Market Opportunity Cost.

For a generating unit that is subject to operational limitations because it only has a limited number of starts or available run hours resulting from (i) the physical equipment limitations of the unit, for up to one year, due to original equipment manufacturer recommendations or insurance carrier restrictions, or (ii) a fuel supply limitation, for up to one year, resulting from an event of force majeure, the Market Participant may include in the calculation of its “other
incremental operating costs” an amount reflecting the unit-specific Non-Regulatory Opportunity Costs expected to be incurred. Such unit-specific Non-Regulatory Opportunity Costs are calculated by forecasting Locational Marginal Prices based on future contract prices for electricity using PJM Western Hub forward prices, taking into account historical variability and basis differentials for the bus at which the generating unit is located for the prior three year period immediately preceding the period of time.

PJM market participants are reminded that the inclusion of opportunity costs for energy and environmentally limited units via this tool is for informational purposes only. Each participant is responsible for his or her cost offer and the rules currently approved in Manual 15, Cost Development Guidelines:

http://pjm.com/~/media/documents/manuals/m15.ashx

The second version of the calculator can assume any standard or rolling compliance time period up to one year, up to two contract fuel prices allocated by ratio, up to two fuel types per unit, fuel delivery costs, start costs and minimum runtime restrictions.

**Step 1: Log into Markets Gateway**

Go to: [https://esuite.pjm.com/mui/](https://esuite.pjm.com/mui/)

If you do not currently have a PJM eSuite account, you can apply for one by clicking on the eSuite New User button as shown below. You will need to provide your company name and request Read/Write access to Markets Gateway.
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.
Step 2: Opening the Opportunity Cost Calculator

Once you have logged in, click on Opportunity Cost Calculator in the left navigation bar. Once you click on the Opportunity Cost Calculator menu item, it will open the calculator page and display six tabs for six sub-pages: Opportunity Costs, Unit Parameters, Delivered Fuel, Future Fuel Delivery, Unit Outages and Forecasted Allowance.

Step 3: Start on the Unit Parameters Tab

To begin, go to the Unit Parameters Tab, choose your portfolio and location and enter the start date as the date for which you are calculating opportunity cost, usually the next operating day; then click the Refresh button.
The fields are defined as follows:

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heat Rate (MMBtu/MWh)</td>
<td>The expected future full load seasonal heat rate (May – September or October– April) for the compliance period. Please note that in a calendar year you will need to submit three heat rates, winter (January– April), summer (May – September) and winter (October – December). This field cannot be null. For the first winter heat rate, click on the calendar icon to the right of the date field and select January within the compliance period, then click change date. Enter the winter heat rate and the rest of the required fields for the unit parameters (VOM, CO2, SO2, NOX, etc), then click submit. For the summer heat rate, click on the calendar icon to the right of the date field and select May, then click change date. Enter summer heat rate and the rest of the fields for the unit parameters, then click submit. For the second winter heat rate, click on the calendar icon to the right of the date field and select October, then click change date. Enter the winter heat rate and the rest of the field for the unit parameters, then click submit.</td>
</tr>
<tr>
<td>VOM ($/MWh)</td>
<td>VOM as used in the cost-based offer as explained by PJM Manual 15, Section 2: Policies for all Unit Types as well as specific unit type constraints in subsequent sections. This field cannot be null.</td>
</tr>
<tr>
<td>CO2 Rate (Lbs/MMBtu)</td>
<td>Unit SO2, CO2 and NOx Emission Rates (lbs/mmBtu) (Note that the CO2 adder is in effect only for incurring mandatory carbon emission charges). If not subject to RGGI then enter $0. This field cannot be null.</td>
</tr>
<tr>
<td>SO2 Rate (Lbs/MMBtu)</td>
<td></td>
</tr>
<tr>
<td>NOX Rate (Lbs/MMBtu)</td>
<td></td>
</tr>
<tr>
<td>FMU Adder ($/MWh)</td>
<td>Frequently Mitigated Unit (FMU) or Associated Unit Adder as defined in PJM Manual 15, Section 9: Opportunity Cost Guidelines. If you enter a value in this field then you cannot select Use % Adder. However, you do not have to choose either FMU Adder or Use % Adder. This field can be null. Only units allowed FMU from the IMM may use the FMU.</td>
</tr>
<tr>
<td>Use % Adder</td>
<td>Per the OA, a generator may include a ten-percent (10%) adder to their computed cost offer as defined in PJM Manual 15. A generator must elect to include this adder in full, in part, or not at all; just as it does it in its cost-based offer. This may not be used together with the FMU Adder. However, you do not have to choose either FMU Adder or Use % Adder. This field can be null.</td>
</tr>
</tbody>
</table>
Min Run Time: MRT is the minimum full hour operation for a unit based on the unit type’s parameter limits. Data entered should be a whole number and no less than 1 or more than 24. This field cannot be null. The value should match the minimum runtime on the cost-based offer.

Start Cost: This is the start cost used in the cost-based offer. Unit-specific start up costs: cold Startup costs for combined cycle and combustion turbine units and hot Startup costs for steam units. If left null, no start cost is assumed.

Economic Max: EcoMax is the highest unrestricted level of energy, in MW, that the operating company operates the unit under normal operation. This represents the highest output available from the unit for economic dispatch. This is a whole number. This field cannot be null.

A Fuel Type
B Fuel Type: The calculator can recognize two types of fuel per unit. Choose Fuel A, the primary type of fuel, from the drop-down. Then choose Fuel B, the secondary type of fuel. If the unit only burns one type of fuel then leave Fuel B as null.

A Price Type
B Price Type: Select Contract if you intend to enter a contract price for the compliance period. Select Spot if you would like to use the market forward price for your fuel.

If you have selected dual fuel types for a unit then you will need to select the correct price type for each fuel. If the unit has only one fuel type, then indicate the price type only once.

A Fuel %
B Fuel %: Indicate the percentage the unit runs on the fuel. If the unit is dual fuel the total of A Fuel% and B Fuel% must equal 1.0 or you will receive an error. Additionally, percentages can only be entered in as tenths using hundredths or thousandths with result in rounding and potential totals that are larger than the 1.0 constraint.

If the unit runs on a single fuel you must indicate that 1.0 of the unit runs on the fuel, otherwise you will receive an error. This field cannot be null.

Once the page has been completed, click the Save button in order to navigate away from the page without losing your entries. The following message: “Success: Save successful” is displayed. Continue to Step 4.

Step 4: Delivered Fuel Tab

After the unit parameters have been submitted, you can enter the future month delivered fuel and delivered fuel history from the three previous years.

For the Monthly Delivered Fuel section you provide the future adders and expected contract price for a fuel delivered to the unit. Please note that if both fuel types selected on Unit Parameter tab are Contract then there will be two places to enter future monthly delivered fuel.

In the Delivered Fuel section you can provide unit fuel history to calculate the volatility adder. If you do not provide the fuel history, the calculator will use default historical fuel price for the unit type.
Step 5: Future Fuel Delivery Tab

To begin, adjust the start date to the beginning of the period to be evaluated such as 1/1/2015 and the end date to the end of the period to be evaluated such as 11/4/15 and click change date. This will create the rows in Monthly Delivered Fuel for the future that you will then populate with data.

Next, click on the Future Fuel Delivery tab. Enter the fuel type, a description of the adder, the fuel adders and the fuel contract price. Click Save when you have entered data in all lines in the block in order to retain the data when you advance to the next page. To advance to additional dates, use the right vertical scroll bar. You may also upload via XML.

After you have submitted the Monthly Delivered Fuel, then adjust the start date to the three years in the past such as 1/1/2009 and the end date to the end of the three year period such as 12/31/11 and click change date. This will create the rows in Delivered Fuel to input the historic fuel that you will then populate with data.

Next, enter the daily historic fuel type, price type (spot or contract) and delivered fuel price in $/mbtu to the unit. Click the Save button when you have entered data in all lines in the block in order to retain the data when you advance to the next page. You may also use the Download XML button instead of entering each of the month’s values by hand. You do not need to click Save if you use the Download XML method.
**Step 6: Unit Outages Tab**

Next, input future unit outages by selecting the **Unit Outages** tab. Enter the start date, start hour, end date and end hour for the time period.

First enter the start date of the period to be evaluated, enter the end date and then click change date to submit. Drop down to the Outages section and click the Add button. Enter the start date, start hour, end date and end hour of the outage.

If you have additional outages click the Add button again filling in the fields. When you have completed outages for the unit click the check box next to each outage and click the submit button.

To make a change after an outage is submitted, click on the row containing the outage, make the change and then click the Save button.

To delete the outage entry after an outage is submitted, right click to display the Remove Item action button and then click left to delete the displayed outage.

**Step 7: Forecasted Allowance Tab**

For rolling compliance time periods, this tab indicates the remaining hours for the time period under rolling evaluation. This tab only needs to be filled out if you are evaluating opportunity costs under a rolling compliance time period.

Begin by changing the effective date to the start of the compliance period for evaluation and the termination date to the end of the compliance period. Click Refresh to make the change.

Then click in the row containing the Effective Day, Termination Day and Forecasted Allowance, or right click to display the Add Item action button. Enter the effective day, termination day and the remaining forecasted allowance. Click the Save button. The following message: “Success: Save successful” is displayed.

To make a change after an outage has been submitted, click on the row containing the Forecasted Allowance, make the change and then click the **Save** button.
To delete the outage entry after an outage is submitted, right click to display the Remove Item action button, click left to delete the displayed outage. Forecasted Allowance Periods cannot overlap.

**Step 8: Opportunity Cost Tab or Bringing it All Together**

Now you are ready to compute opportunity cost. For each of the three previous years, the calculator will find the opportunity cost for that year by taking the average total margin of the lowest value block added before the run hour limit was reached. The three opportunity costs will then be averaged to get the opportunity cost adder available to the generator. If the opportunity cost adder is less than 0, the opportunity cost adder will be set to 0.

Click on the Opportunity Cost tab, change start date and end date for the period of compliance then push the Change Date button.

If you are using a rolling compliance time period click the check box next to Rolling and make sure that the Forecasted Allowance is indicated on the Forecasted Allowance tab as described in Step 5.

If you are using the standard (no rolling) compliance period, enter the number of run hours left within the compliance period in the Allotted Run Hours field. This number should not be greater than 8760 in a normal year or 8784 in a leap year.

Once you are ready to compute, hit calculate costs and wait for it to populate. Opportunity Cost Calculator displays the three numbers that correspond to the minimum run hour, the three base year margin hours are averaged together to get the maximum opportunity cost available to the generator.

**Step 9: Enter Opportunity Cost Result into your Offer**

The calculated Opportunity Cost is a maximum. The Opportunity Cost Component will not be added to your Cost Offer by PJM. You must enter your opportunity cost component in your segmented energy offer in Markets Gateway.

From the navigation bar at the left side of the page, choose Generator > Schedules > Detail. In the Costs information section, enter the data in the text box labeled ‘Opportunity Cost’.
Then you must add the Opportunity Cost Component to your cost offer for each price/mw increment.

From the navigation bar at the left side of the page choose Generator > Schedules > Offers. Enter the Portfolio, Location and Schedule for which you calculated the Opportunity Cost. Enter the date and then select “COSTBASE”. Under the Price section on the right hand side of the screen add the Opportunity Cost to each price increment. The number will turn green and display your entry when you have successfully entered it.