



PJM eMKT Users Guide

Effective May 2012

Disclaimer -

The *PJM eMKT Users Guide* is intended to provide Market Participants and other interested parties with introductory information about the Day Ahead Market and Ancillary Services bidding and administrative processes. The Users Guide is an instructional tool and is not intended to be a complete source of information about PJM's bidding and administrative processes. The PJM RTO provides no warranties of any kind with respect to the correctness or completeness of the information set forth in this Users 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 eMKT Users Guide* is not designed, nor is it intended to provide advice or guidance with respect to strategies for bidding into the Day Ahead and regulation markets.

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2012 Revision- (May 2012)

- Added Appendix Instructions for Opportunity Cost Calculator

2012 Revision-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

Introduction

The PJM eMKT Users 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 eMKT

PJM eMKT is the system that PJM Market Participants use to participate in the Day-Ahead Energy Market, Synchronized Reserve Market and Regulation Market. Market Participants can use PJM eMKT 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
- Review public and private Day-Ahead Energy market results
- Review public and private Ancillary Services Market results

Interfacing with eMKT

Market Participants have two primary methods of interacting with PJM eMKT. 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 3 of this Users 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 18 of this Users Guide describes how to use the MUI to perform these tasks.

Who is this Users Guide for?

This PJM eMKT Users Guide is for Market Participants who need to use eMKT 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, and Day-Ahead clearing prices for regulation
- 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 eMKT Users Guide is written under the assumption that you:

- Understand how PJM's Day-Ahead Market, Regulation Market, and Synchronized Reserve Market 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)

PJM eMKT Application

eMKT Overview

PJM eMKT is designed to make it easy for PJM Market Participants to participate in PJM's Day-Ahead Energy Market, Regulation Market, and Synchronized Reserve Market. Market Participants use PJM eMKT to submit generation offers, regulation offers, and demand bids in the Day-Ahead Energy market, as well as review the results of the Day-Ahead market.

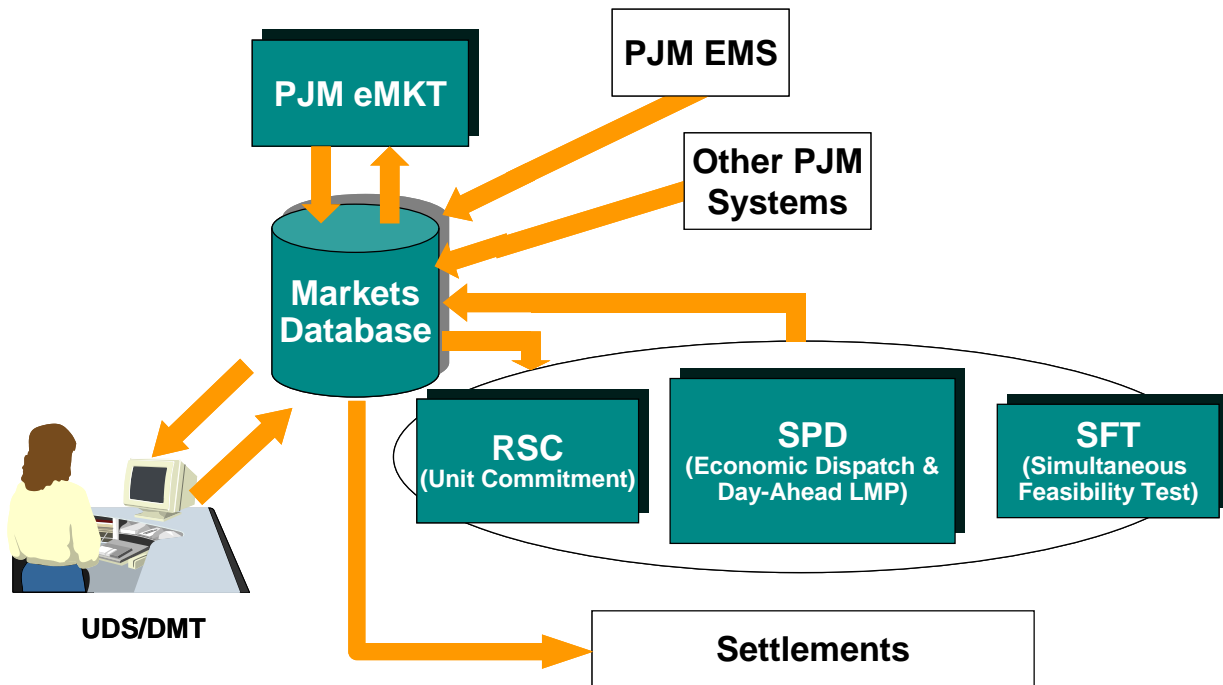
PJM eMKT Components

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: generating 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 Operating reserve objectives, while minimizing total production cost (subject to certain transmission limitations).
- **Scheduling Pricing and Dispatch (SPD)** — The SPD module performs the security-constrained dispatch and calculates the Day-Ahead LMPs. The solution from SPD is passed to STNET 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 or RSC, as necessary.

Other PJM systems provide data to PJM eMKT, including external grid/flow modeling, outage schedules, and facility ratings.

For the Day-Ahead Energy Market clearing, PJM eMKT consists of the following components:



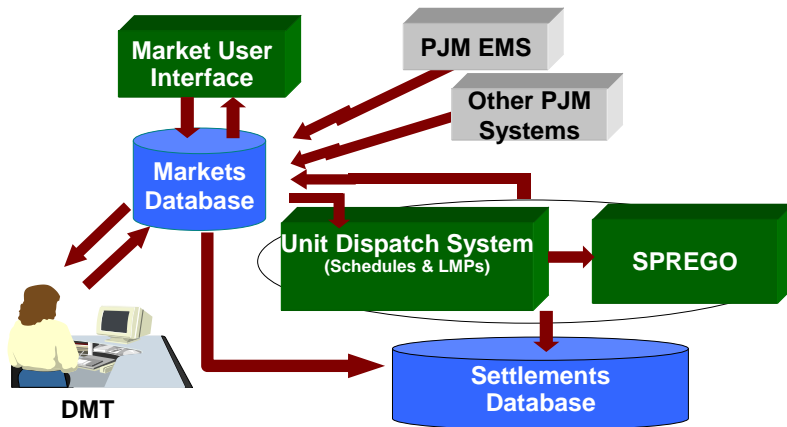
This is a conceptual view of the Day-Ahead Market software. All of the data exchanges are conceptual.

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 eMKT'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 one additional software module:

- **Synchronized Reserve and Regulation Optimizer (SPREGO)** — The SPREGO is the Synchronized Reserve and Regulation Market software. It uses the regulation offers, Synchronized Reserve offers, and commitment data to determine the Regulation Market clearing price (RMCP) and Synchronized Reserve market clearing price (SRMCP). It also determines a preliminary forecast of which units will provide regulation and Synchronized Reserve. SPREGO performs regulation and Synchronized Reserve market dispatch to minimize the total cost of energy, regulation and Synchronized Reserve dispatch.

Spinning Reserve & Regulation Subsystems



DMT = Dispatcher Management Tool

SPREGO = Spinning & Regulation Regulation Optimizer

eMKT Website

Market Participants interface with PJM eMKT via the Market User Interface, or MUI. The PJM eMKT application is integrated into PJM eSuite environment which allows the user to access various PJM web based applications via a single username and password. The eSuite environment is accessed via Internet facilities, using the following Web Browser:

- Microsoft Internet Explorer Version 5.5 or later

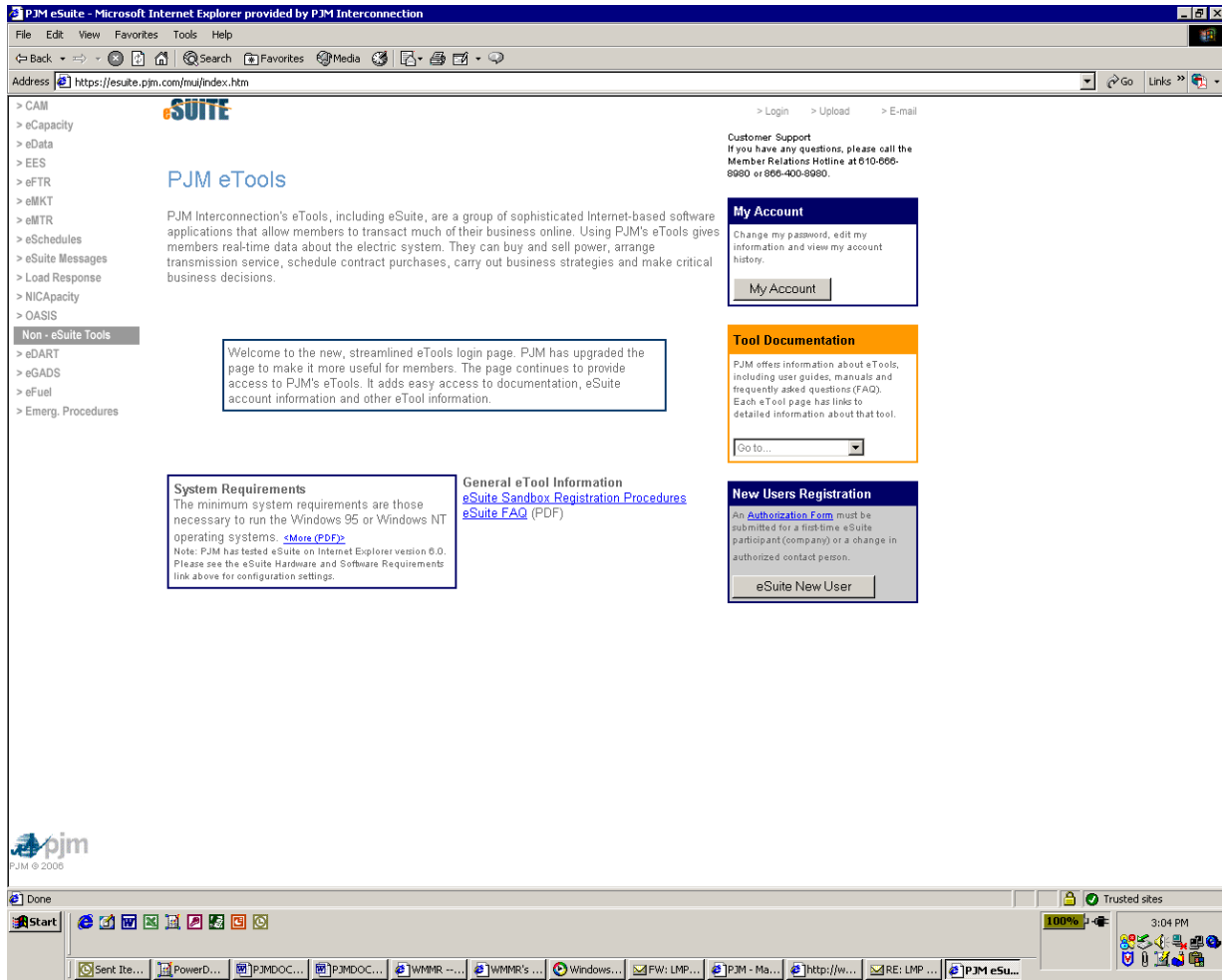
eSuite Application Privileges - eMKT

To access eMKT, Market Participants must have a valid eSuite user account. Prior to accessing, the public or the private generation or demand web pages you must be a valid eMKT user with specific privileges. There are several types of eMKT privileges for registered eSuite 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 an eMKT administrator that can set thresholds for fixed demand bids, inc offers, and dec bids.
- **Public Read Only** - Users that are designated as a public eMKT user can view public market results.

You must identify the type of user you want to be at the time you register to become an eMKT user.

These privileges can be set by an individual company's Company Account Manager (CAM)



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.

The screenshot shows the PJM eSuite web application interface. The browser window title is "PJM eSuite - Microsoft Internet Explorer provided by PJM Interconnection". The address bar displays "https://esuite.pjm.com/muj/index.htm". The page features a navigation menu on the left with "Non - eSuite Tools" selected. The main content area is divided into two sections: "Company Information" and "Company eSuite Application Privileges".

Company Information

Org Id: 3522
 Company Name: Other
 Short Name: Other
 Company Type: Misc.
 Duns ID:
 MSET Flag: N

Company eSuite Application Privileges

Application Privileges	Effective Date (mm/dd/yyyy)	Terminate Date (mm/dd/yyyy)	
CAM Read/Write	02/28/2003	02/27/2003	Edit
eData General	01/01/2001		Edit
eMKT Public	02/17/2004		Edit
OASIS Read Only	01/01/2001		Edit

The PJM logo and copyright notice "PJM © 2006 All rights reserved." are visible at the bottom of the page.

Accessing PJM eMKT Application

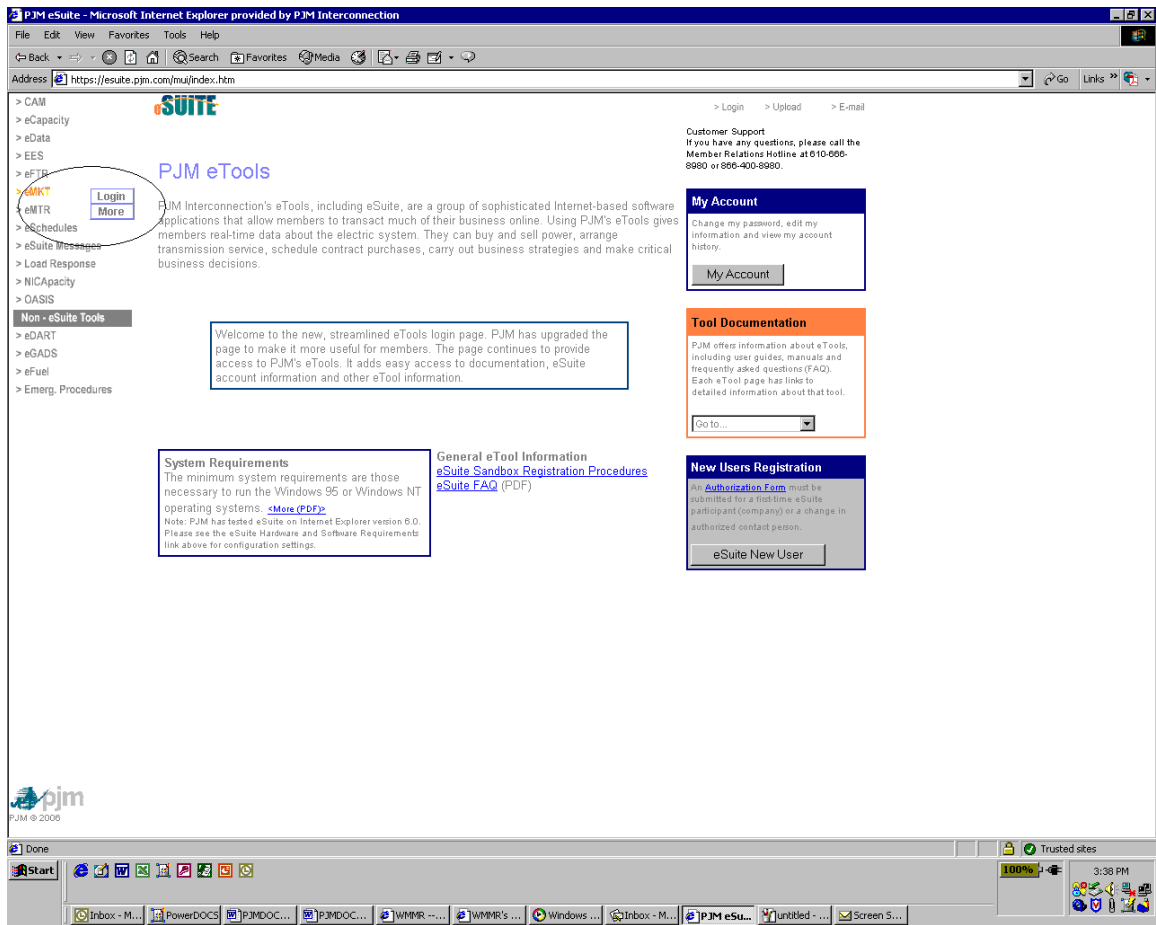
1. Enter the following URL for PJM eSuite on the ADDRESS field of Internet browser:

esuite.pjm.com.

The screenshot displays the PJM eSuite application interface within a Microsoft Internet Explorer browser window. The browser title is "PJM eSuite - Microsoft Internet Explorer provided by PJM Interconnection". The address bar shows the URL "https://esuite.pjm.com/ma/index.htm". The page content includes a navigation menu on the left with categories like CAM, eCapacity, eData, EES, eFTR, eMKT, eMTR, eSchedules, eSuite Messages, Load Response, NICCapacity, OASIS, and Non-eSuite Tools. The main content area features the "PJM eTools" logo and a welcome message: "Welcome to the new, streamlined eTools login page. PJM has upgraded the page to make it more useful for members. The page continues to provide access to PJM's eTools. It adds easy access to documentation, eSuite account information and other eTool information." Below this are sections for "System Requirements", "General eTool Information" (with links to "eSuite Sandbox Registration Procedures" and "eSuite FAQ (PDF)"), "My Account", "Tool Documentation", and "New Users Registration". The footer shows the PJM logo and "PJM © 2008". The Windows taskbar at the bottom shows several open applications including "Inbox - M...", "PowerDOC...", "PJMDOC...", "WMMR...", "Windows...", and "PJM eSu...". The system tray shows "100%" zoom, "3:41 PM", and a network icon.

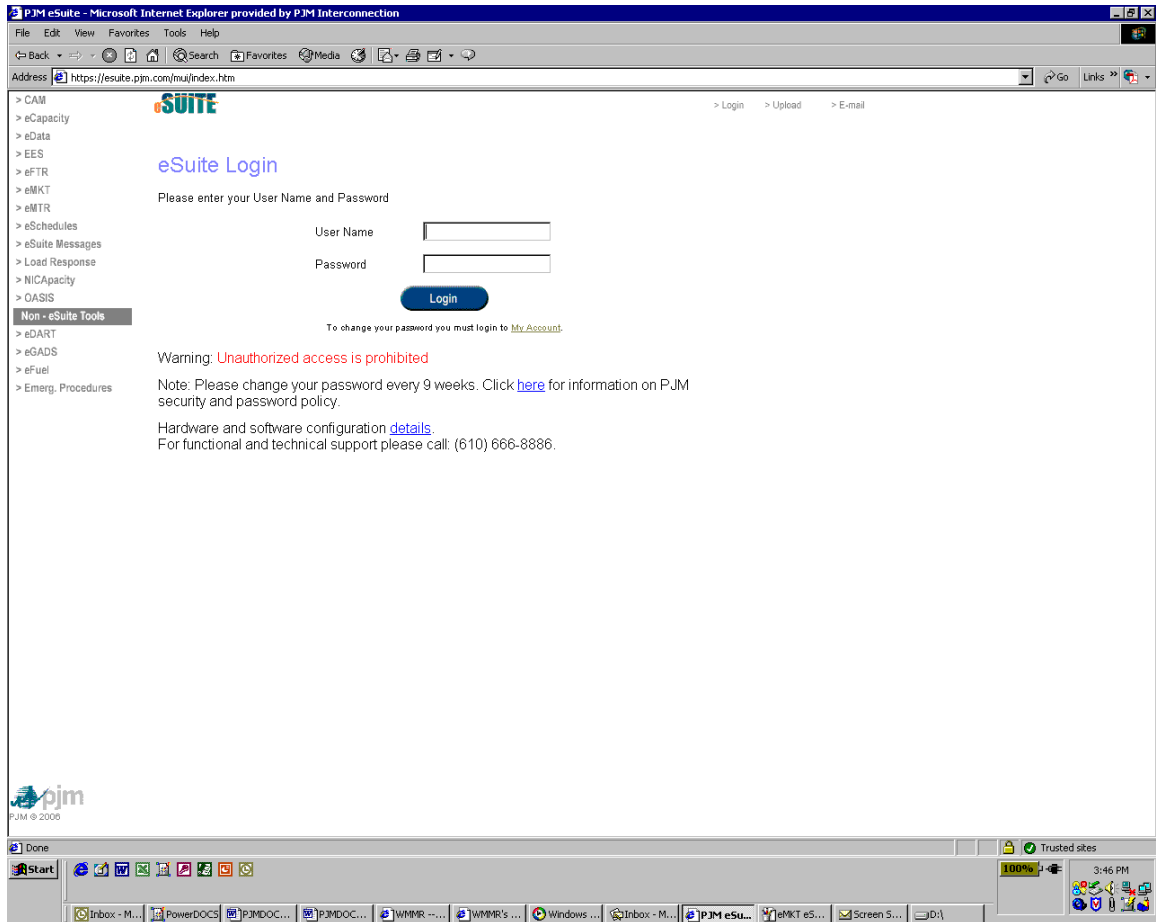
2. Select the eMKT Application.

The eSuite login screen appears for eMKT application



3. Type in Username and Password.

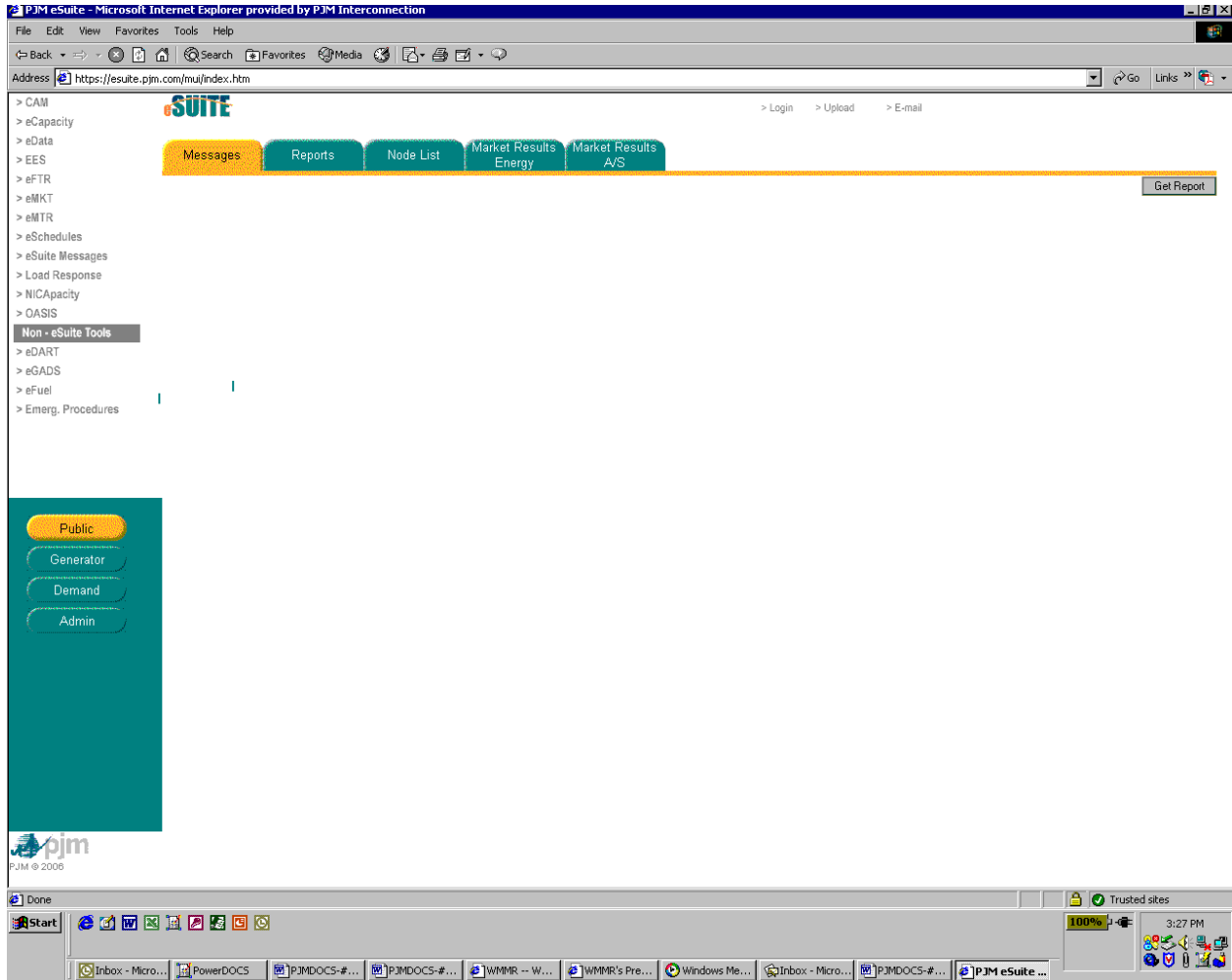
You must login as a qualified user of eMKT.



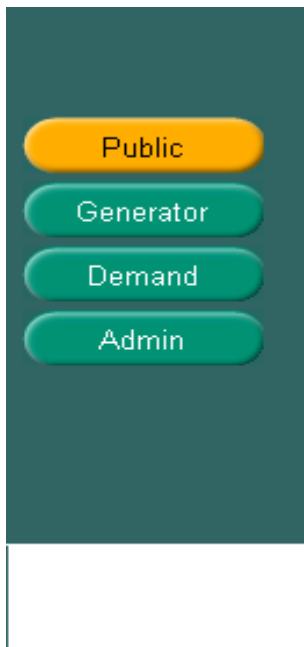
PJM eMKT Navigation

Using the PJM eMKT web site, you can navigate to other PJM web sites.

This figure illustrates the following components used to navigate within the eSuite environment:



This figure illustrates the Navigation Buttons on the eMKT Menu used to navigate within the eMKT system:



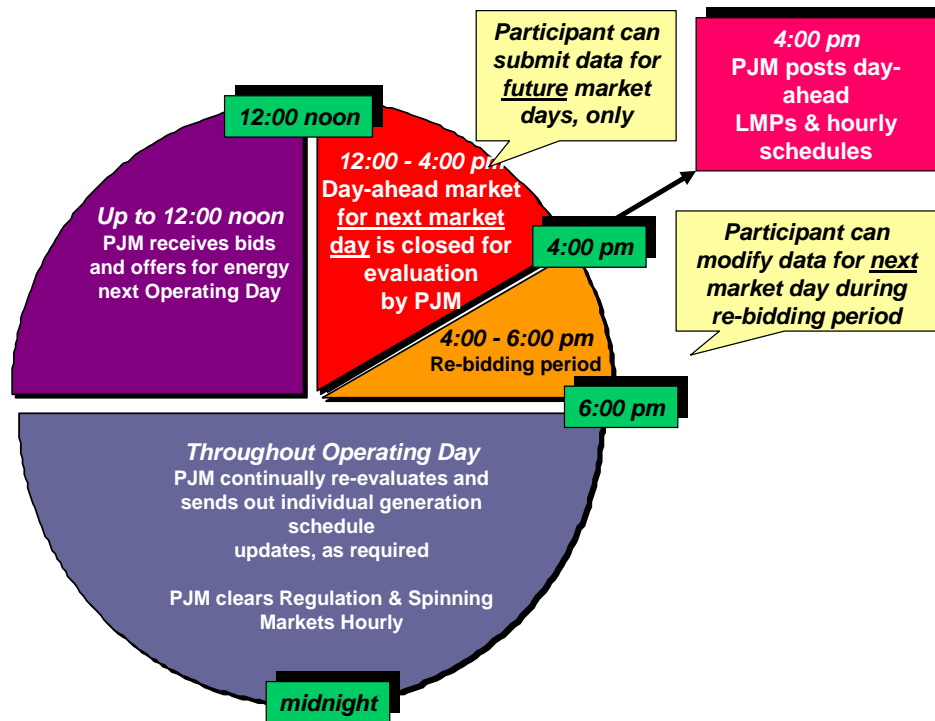
eMKT Navigation Buttons — The Navigation Buttons provide links to the following PJM web pages within the eMKT System:

- Public
- Generator
- Demand
- Administration

PJM Market Timeline

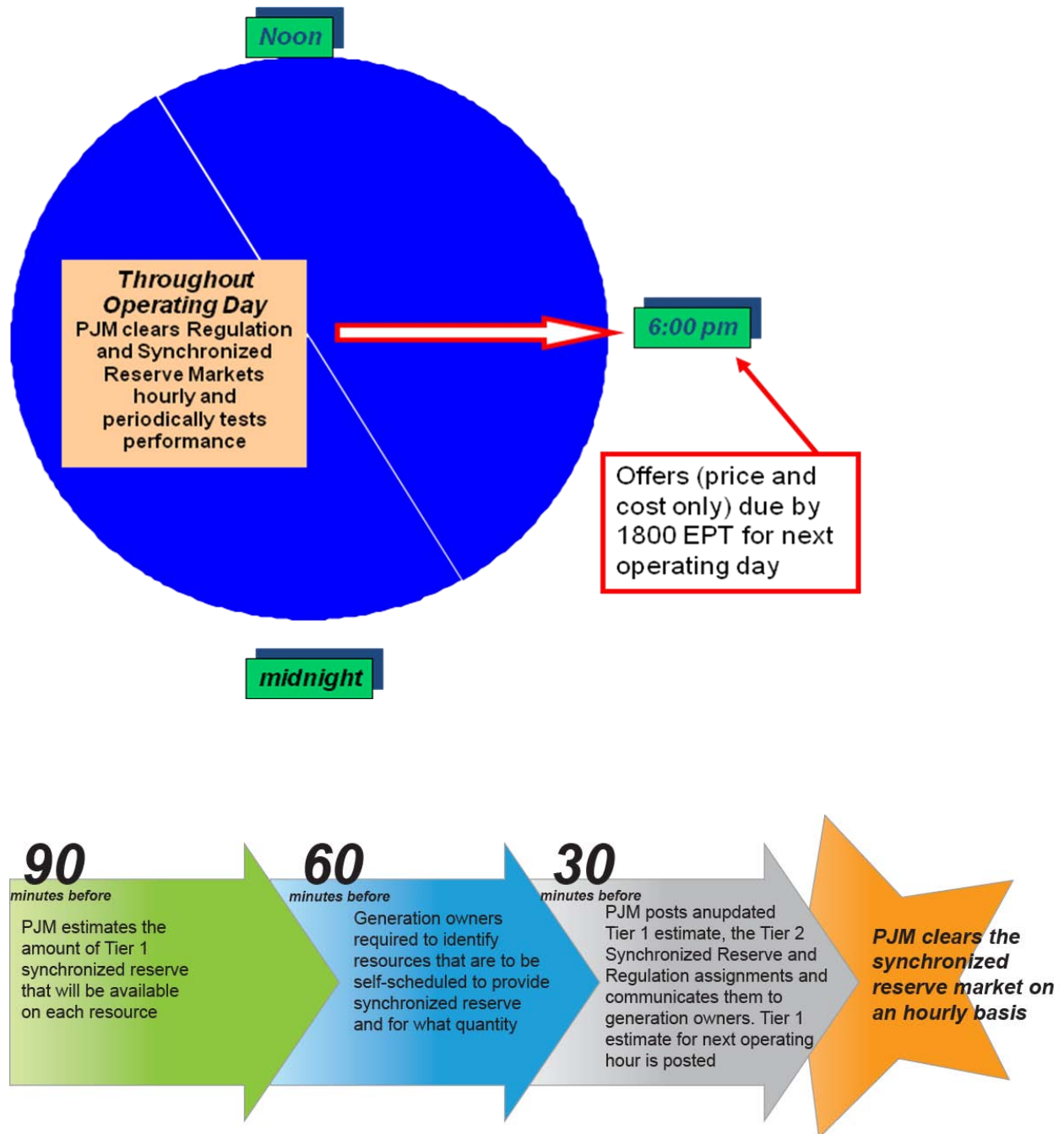
Day-Ahead Energy Market Timeline

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:



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

Ancillary Services Market Timeline



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

Managing Information

What 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.

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 eMKT outages due to system maintenance
- Notification of system enhancements
- Extension of market bidding periods due to system outages

Steps:

- 1) Select the Public button.
- 2) Select the Messages tab.
The Messages web page appears.
- 3) Review the public messages.

Viewing Market Results

Overview

Prior to accessing eMKT web pages you must be a registered eMKT user. Depending upon PJM membership status, registered eMKT 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 eMKT 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, procured and clearing prices, Synchronized Reserve Markets requirements, Tier1 estimate, Tier2 procured, and clearing prices.

- **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.
- **Binding Limits** — use this web page to view binding transmission constraints in the Day-Ahead market.
- **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.
- **A/S Market Prices** — use this web page to view clearing prices in the ancillary services markets.
- **Regulation Results** — use this web page to view the results of the Regulation Market.
- **Synchronized Results** — use this web page to view the results of the Synchronized Reserve market.
- **RA Commitment** — use this web page to view the results of the Reliability Commitment

View Day-Ahead Demand Information

An eMKT user can view demand information, including the total Day-Ahead demand bids, as submitted by Market Participants. The title reflects the date selected:

Demand Summary for *Date*

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 RTO.
- **PJM's Day-Ahead Load Forecast** — PJM RTO's Day-Ahead load forecast, in MW, calculated by PJM for reliability purposes.
- **Day-Ahead Operating Reserve Objective for area PJM** — The total PJM Operating Reserve Objective, in MW, calculated based on the Day-Ahead demand.
- **Day-Ahead Operating Reserve Objective for PJM Control Zones** — The total Operating Reserve Objective, in MW, calculated for each individual PJM Control Zone based on the Day-Ahead demand.

Steps:

- 1) Select the Public Menu button.
- 2) Select the Market Results Energy tab.
- 3) Select the Demand Summary page.

The Demand Summary web page appears.

- 4) Select the desired date.
- 5) Select Change Date.
- 6) Review the following Day-Ahead demand information:
 - Day-Ahead Demand
 - PJM Day-Ahead Load Forecast
 - Day-Ahead Operating Reserve Objective for area PJM
 - Day-Ahead Operating Reserve Objective for each PJM Control Zone
- 7) To download selected information, select Get Report button.
- 8) Select “Save” when the pop-up window appears
The file is downloaded to your local directory

View Day-Ahead Market Prices

An eMKT 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 the PJM RTO, 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:

- **PJM Hubs**
- **PJM Zones**
- **PJM Interface Buses**

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

- **Hour** — Hourly values are shown in two rows: the first row is hours 1 through 12 and the second row presents hours 13 through 14. (The headers show 1/13, 2/14, 3/15, indicating the first row of values represent results for hours 1, 2, 3, etc. and the second row of values represent results for hours 13, 14, 15, etc.)
- **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:

- 1) Select the Public button.
- 2) Select the Market Results Energy tab.
- 3) Select the Market Prices page.
The Market Prices web page appears.

- 4) Select the desired date.
- 5) Select Change Date.
- 6) Select the desired portfolio name from the Portfolio List.

The nodes defined for the selected portfolio appear, as reflected in the title (Day-Ahead Prices for “Portfolio” for “Date”).

- 7) 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
- 8) To download selected information, select Get Report button.
- 9) Select “Save” when the pop-up window appears

The file is downloaded to your local directory

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 title, as follows:
Day-Ahead Limit on “Monitored Facility”
- **Actual or Contingency** — the facility for which its outage would cause a monitored facility violation. The actual and contingencies are listed under the “Contingency” column.
- **Hours** — the hours during which the binding constraint exist during the Day-Ahead market. These are indicated by an X in the hour column.

Steps:

- 1) Select the Public button.
- 2) Select the Market Results Energy tab.
- 3) Select the Binding Limits page.
The Binding Limits web page appears.
- 4) Select the desired date.
- 5) Select Change Date.
- 6) Review the following Day-Ahead binding constraint information for each hour:
 - Monitored Facility
 - Actual or Contingency
 - Hours

7) To download selected information, select Get Report button.

8) Select “Save” when the pop-up window appears

The file is downloaded to your local directory

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 the PJM RTO. 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:

- **Western Interface** — Includes the Keystone-Juniata 5004 line, the Conemaugh-Juniata 5005 line, the Conemaugh-Huntertown 5006 line, and the Doubs-Brighton 5055 line.
- **Central Interface** — Includes the Keystone-Juniata 5004 line, the Conemaugh Juniata 5005 line, and the Conastone-Peach Bottom 5012 line.
- **Eastern Interface** — Includes the Wescosville-Alburtis 5044 line, the Juniata-Alburtis 5009 line, the TMI-Hosensack 5026 line, the Peach Bottom-Limerick line, and the Peach Bottom-Keeney 5014 line.
- **APS South** — Includes the Doubs-Mt. Storm 500 KV line and Meadowbrook Mt. Storm 500 line.
- **Bedington-Black Oak** — Includes the Bedington-Black Oak 500 line.

The title reflects the interface and the date selected:

Interface for Date

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:

- 1) Select the Public button.
- 2) Select the Market Results Energy tab.
- 3) Select the Interface Limits page.

The Interface Limits web page appears.

- 4) Select the desired date.
- 5) Select Change Date.

The selected Operating Day's Day-Ahead actual flows and operating limits appear.

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

- Operating Limit
- Actual Flow

7) To download selected information, select Get Report button.

8) Select “Save” when the pop-up window appears

The file is downloaded to your local directory

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 the PJM RTO; a negative value indicates a flow out of the PJM RTO.

The title reflects the date selected:

Net Tie Schedules for *Date*

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

Steps:

1) Select the Public button.

2) Select the Market Results Energy tab.

3) Select the Net Tie Schedules page.

The Net Tie Schedules web page appears.

4) Select the desired date.

5) Select Change Date.

The selected Operating Day’s Day-Ahead net tie schedules appear.

6) Review the following net tie schedules for the each interface for each hour:

7) To download selected information, select Get Report button.

8) Select “Save” when the pop-up window appears

The file is downloaded to your local directory

View Ancillary Services Prices

An eMKT user can view the ancillary services clearing prices for the Regulation Market and the Synchronized Reserve market. The title reflects date selected:

A/S Market Prices for *Date*

The following Synchronized Reserve results information is posted:

- **Area/Sub-Zone** — Each Reserve Zone Area
- **Price** — The Synchronized Reserve market clearing price (SRMCP) for each hour

Regulation Market Prices for *Date*

The following regulation results information is posted:

- **Area** — PJM Regulation zone
- **Price** — The Regulation Market clearing (RMCP) price for each hour

Steps:

- 1) Select the Public button.
- 2) Select the Market Results A/S tab.
- 3) Select the A/S Market Prices page.
The A/S Market Prices web page appears.
- 4) Select the desired date.
- 5) Select Change Date.
The selected date's ancillary services prices appear.
- 6) Review the following ancillary services prices for each hour:
 - Hour
 - Area/Sub-Zone
 - Price
- 7) To download selected information, select Get Report button.
- 8) Select "Save" when the pop-up window appears
The file is downloaded to your local directory

View Synchronized Reserve Market Clearing Results

An eMKT user can view the Synchronized Reserve market clearing results for the Synchronized Reserve market. The title reflects date selected:

Synchronized Results for *Date*

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.** — Estimated Synchronized Reserve Market Tier-1 MW capability.
- **Tier-2 Req.** — Required Synchronized Reserve Market Tier-2 MW capability.
- **Tier-2 Self.Sched.** — Self-Scheduled Synchronized Reserve Market Tier 2 MW capacity.
- **Tier-2 Assigned** — Assigned Synchronized Reserve Market Tier 2 MW capability.

- **Total** — Total Amount of Estimated Tier-1 Synchronized Reserve capability, Tier-2 Self-Scheduled Synchronized Reserve capability and Assigned Tier-2 Synchronized Reserve capability
- **Deficiency** — Synchronized Reserve Market deficiency
- **SRMCP** — The Synchronized Reserve market clearing price (SRMCP) for each hour.

Steps:

- 1) Select the Public button.
- 2) Select the Market Results A/S tab.
- 3) Select the Synchronized Results page.
The Synchronized Results web page appears.
- 4) Select the desired reserve area or sub- zone.
- 5) Select the desired date.
- 6) Select Change Date.
The selected date's synchronized reserve results appears.
- 7) Review the following Synchronized Reserve market results for each hour:
 - Hour
 - Requirement
 - Tier-1Est.
 - Tier-2 Req.
 - Tier-2 Self-Sched.
 - Tier-2 Assigned
 - Total
 - Deficiency
 - SRMCP
- 8) To download selected information, select Get Report button.
- 9) Select "Save" when the pop-up window appears
The file is downloaded to your local directory

View Regulation Market Clearing Results

A public user can view the Regulation Market clearing results for the Regulation Market. The title reflects date selected:

Regulation Results for *Date*

The following Regulation Market results information is posted:

- **RMCP** — The Regulation Market clearing price (RMCP) for each hour.
- **Self.Sched.** — Self-Scheduled Regulation Market capability.

- **Procured** — Procured Regulation capability.
- **Total** — Total Self Scheduled Regulation capability and Procured Regulation capability.
- **Required** — 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.
- **Deficiency** — Regulation Market deficiency.

Steps:

- 1) Select the Public button.
- 2) Select the Market Results A/S tab.
- 3) Select the Regulation Results page.
The Regulation Results web page appears.
- 4) Select the desired control area (currently there is only one regulation area).
- 5) Select the desired date.
- 6) Select Change Date.
The selected date's regulation results appear.
- 7) Review the following Regulation Market results for each hour:
 - Hour
 - RMCP
 - Self. Sched.
 - Procured
 - Total
 - Requirement
 - Deficiency
- 8) To download selected information, select Get Report button.
- 9) Select "Save" when the pop-up window appears.
The file is downloaded to your local directory

Managing Generation Portfolios

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

What Web Pages Do I Use?

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

- **Portfolio Manager** — use this page to view existing generation portfolios and to create, update, and delete generation portfolios.

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:

- 1) Select any of the Generation web pages:
- 2) Select the desired portfolio from the Portfolio list.
The generating units for the selected portfolio appear in the Units List.
- 3) Review the defined generating units in the Units list for the selected portfolio.

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:

- 1) Select the Admin button.
- 2) Select the Portfolio Manager tab.
The Portfolio Manager web page appears.
- 3) Select the Create New Portfolio action button.
A new row appears.
- 4) Enter the new portfolio's name in the Portfolio field.
- 5) Select the Generator button.
- 6) Select the Add action button.
A new row appears.
- 7) Begin typing the unit name and a filter list of generating units will appear. Highlight the desired generating unit in the Location name List.
- 8) Click outside entry box.
The color changes to red and the selected generating unit appears in the Location Name field.
- 9) Select the Submit action button.
The color changes to green and the line is highlighted yellow. The unit has been added to portfolio successfully
- 10) Select the User Setup tab.
- 11) Select the "Submit Changes and Refresh Cache" button.

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:

- 1) Select the Admin button.
- 2) Select the Portfolio Manager tab.

The Portfolio Manager web page appears.

- 3) Select and highlight the portfolio's name in the Portfolio field.
- 4) Select the Add action button.

A new row appears.

- 5) Begin typing the unit name and a filter list of generating units will appear. Highlight the desired generating unit in the Location List.
- 6) Click outside entry box.

The color changes to red and the selected generating unit appears in the Location Name field.

- 7) Select the Submit action button.

The color changes to green and the line is highlighted yellow. The unit has been added to portfolio successfully.

- 8) Select the User Setup tab.
- 9) Select the "Submit Changes and Refresh Cache" button.

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:

- 1) Select the Admin button.
- 2) Select the Portfolio Manager tab.

The Portfolio Manager web page appears.

- 3) Select and highlight the portfolio's name in the Portfolio field.
- 4) Select the Delete Portfolio action button.

The portfolio disappears from the Portfolio list.

- 5) Select the User Setup tab.
- 6) Select the "Submit Changes and Refresh Cache" button.

Delete a Unit from a Generation Portfolio

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

Steps:

- 1) Select the Admin button.
- 2) Select the Portfolio Manager tab.

The Portfolio Manager web page appears.

3) Select and highlight the portfolio's name in the Portfolio field.

4) Select a generating unit by click in the box at the left.

The row color will change to light green.

5) Select the Delete action button.

The row disappears and the generating unit is deleted.

6) Select the Submit action button.

7) Select the User Setup tab.

8) Select the "Submit Changes and Refresh Cache" button.

Viewing Private Generation Information

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.

What 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.

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:

1) Select the Generation button.

2) Select the Market Results tab.

3) Select the Generator Market Results page.

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 Units List.

- 5) Select the desired date.
- 6) Select Change Date.

The selected Operating Day's day-ahead generation schedules & LMPs will appear.

- 7) Review the following information for each generating unit in the portfolio for each hour:
 - Location/Schedule
 - MWs
 - Prices
 - Total Portfolio MW

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.
- **Dev MW** — The MW deviation; or the deviation between the current generation from the desired generation
- **En Min** -- The minimum energy associated with lambda generation.
- **En Max** -- The maximum capacity energy associated with lambda
- **Cap Max** – The maximum capacity MW associated with lambda Generation
- **Status** – The reason for lambda generation.

Steps:

- 1) Select the Generation button.
- 2) Select the Dispatch Lambda tab.

The Dispatch Lambda web page appears.

The list of generating units included under the Operating Company's Control appears.

- 3) Review the following information for each generating unit:
 - Location
 - Schedule

- Lambda
- Gen MW
- Non-Ramp MW
- Reg MW
- Dev MW
- En Min
- En Max
- Cap Max
- Status

4) To download selected information, select Get Report button.

5) Select “Save” when the pop-up window appears.

The file is downloaded to your local directory

Managing Unit Data

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 start-up and no load prices for priced-based units. Regulation limits are also defined on a unit basis.

What 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.

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 the ***PJM Manual for 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 Shortname** — 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.

The title reflects the unit detail results as follows:

UNIT DETAIL RESULT FOR *UNIT LONGNAME* (UNIT NUMBER) ON DATE

Steps:

- 1) Select the Generator button.
- 2) Select the Unit tab.
- 3) Select the Unit Detail page.
The Unit Detail web page appears.
- 4) Select the desired date.
- 5) Select Change Date.
- 6) Select the desired portfolio from the Portfolios list.
The list of generating units for the selected portfolio appears in the Units List.
- 7) Select the desired unit from the Units list.
The unit data for the selected unit appears on the Unit Detail page.
- 8) Review the following unit-specific ownership information:
 - Type of Unit
 - Unit Number
 - Operating Company
 - Plant Name
 - Unit Shortname
 - Node
 - Capacity Resource
 - Regulation Resource
- 9) To download selected information, select Get Report button.
- 10) Select "Save" when the pop-up window appears.
The file is downloaded to your local directory

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;
- Which 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.
- **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.
- **Economic Max (MW)** — The highest unrestricted level of energy, in MW, that the operating company operates the unit. This represents the highest available 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 except for qualified unit that has been granted exception by PJM due to unit physical limitation. 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.
- **Default Ramp Rate (MW/Min.)** — The default energy ramp rate, in MW/minute, for increasing or decreasing a unit's output. This average rate is used by PJM in the Day-Ahead commitment process. The default value is 1.0 MW/minute.

Steps:

- 1) Select the Generator button.
- 2) Select the Unit tab.
- 3) Select the Unit Detail page.

The Unit Detail web page appears.

- 4) Select the desired date.
- 5) Select Change Date.
- 6) Select the desired portfolio from the Portfolio list.

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

- 7) Select the desired unit from the Units List.

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

- 8) Review the following unit-specific information:
 - Emergency Min (MW)
 - Economic Min (MW)
 - Economic Max (MW)
 - Spin Max (MW)
 - Emergency Max (MW)
 - Default Ramp Rate (MW/Min.)
- 9) Select the value you wish to update. Green values may be updated.
An entry box will appear.
- 10) Update the limits by entering the new value. Click outside the entry box.
The new value will change to red.
- 11) Select the Submit action button.
The new value will change to green when successfully submitted.
- 12) To download selected information, select Get Report button.
- 13) Select “Save” when the pop-up window appears.
The file is downloaded to your local directory.

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 during real-time operations; the average energy ramp rate (entered on the Unit Detail web page) is used during the day-ahead commitment process.

A maximum of ten 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.
- **Energy Ramp Rate**— The ramp rate in MW per minute at the unit MW output defined for this segment.

The title reflects the energy ramp rates as follows:

ENERGY RAMP RATES FOR UNIT NAME (UNIT ID) ON DATE

Steps:

- 1) Select the Generator button.
- 2) Select the Unit tab.
- 3) Select the Energy Ramp Rates page.

The Energy Ramp Rates web page appears.

- 4) Select the desired date.
- 5) Select Change Date.
- 6) Select the desired portfolio from the Portfolio list.

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

- 7) Select the desired unit from the Units List.

The ramp rate segment data for the selected unit appears on the web page, as reflected in the title (Energy Ramp Rates for "Unit Name (Unit ID)").

- 8) Select the Add action button.

A new row appears on the web page.

- 9) Enter the following data:

- MW
- Ramp Rate

- 10) Click outside the entry box.

The new value will change to red.

- 11) Select the Submit action button.

The new value will change to green and the line is highlighted yellow when successfully submitted.

- 12) To download selected information, select Get Report button.

- 13) Select "Save" when the pop-up window appears.

The file is downloaded to your local directory.

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.

The title reflects the synchronized ramp rates as follows:

SYNCHRONIZED RAMP RATES FOR UNIT LONGNAME (UNIT ID) ON DATE

Steps:

- 1) Select the Generator button.
- 2) Select the Unit tab.
- 3) Select the Synchronized Ramp Rates page.
The Synchronized Ramp Rates web page appears.
- 4) Select the desired date.
- 5) Select Change Date.
- 6) Select the desired portfolio from the Portfolio list.
The list of generating units for the selected portfolio appears in the Units List.
- 7) Select the desired unit from the Units list.
The synchronized ramp rate segment data for the selected unit appears on the web page, as reflected in the title (Synchronized Ramp Rates for "Unit Name (Unit ID) on Date").
- 8) Select the Add action button.
A new row appears on the web page.
- 9) Enter the following data:
 - MW
 - Ramp Rate
- 10) Click outside the entry box.
The new value will change to red.
- 11) Select the Submit action button.
The new value will change to green and the line is highlighted yellow when successfully submitted.
- 12) To download selected information, select Get Report button.
- 13) Select "Save" when the pop-up window appears.
The file is downloaded to your local directory

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 for 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:

- 1) Select Generator button.
- 2) Select Unit tab.
- 3) Select the Unit Detail page.
The Unit Detail web page appears.
- 4) Select the desired date.
- 5) Select Change Date.
- 6) Select the desired portfolio from the Portfolios list.
The list of generating units for the selected portfolio appears in the Units list.
- 7) Select the desired unit from the Units list.
The unit data for the selected unit appears on the Unit Detail web page, as reflected in the title (Unit Detail Result for “Uni Name (Unit ID)” on Date).
- 8) Select Default Status
Dropdown box will appear.
- 9) Select one of the following fields:
 - Economic
 - Emergency
 - Must Run
 - Not Available
- 10) Select the Submit action button.
The new value will change to green when successfully submitted.
- 11) To download selected information, select Get Report button.
- 12) Select “Save” when the pop-up window appears.

The file is downloaded to your local directory

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 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. 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:

- 1) Select Generator button.
- 2) Select Unit tab.
- 3) Select the Unit Detail page.
The Unit Detail web page appears.
- 4) Select the desired date.
- 5) Select Change Date.
- 6) Select the desired portfolio from the Portfolio list.
The generating units for the selected portfolio appear in the Units list.
- 7) Select the generating unit that you want to self-schedule from the Units list.
The data for the selected generating unit appears on the Unit Detail web page, as reflected in the title (Unit Detail Result for "Unit Name (Unit ID)" on Date).
- 8) Select the Must Run status field.
- 9) Enter the following data the ability to follow PJM dispatch instructions:
 - Economic Min
 - Economic Max
- 10) Select the Submit action button.
The new value will change to green when successfully submitted.
- 11) To download selected information, select Get Report button.
- 12) Select "Save" when the pop-up window appears.
The file is downloaded to your local directory

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 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. 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 Fixed Gen field is not used 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.

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:

- 1) Select the Generator button.
- 2) Select Unit tab.
- 3) Select the Unit Detail page.
The Unit Detail web page appears.
- 4) Select the desired date.
- 5) Select Change Date.
- 6) Select the desired portfolio from the Portfolio list.
The generating units for the selected portfolio appear in the Units list.
- 7) Select the generating unit that you want to self-schedule from the Units list.
The data for the selected generating unit appears on the Unit Detail web page, as reflected in the title (Unit Detail Results for “Unit Name (Unit ID)” on Date).
- 8) Select the Must Run status field.
- 9) Select the Fixed Gen field if a generation resource intends to remain “fixed” or otherwise not follow PJM real-time dispatch.
 - Yes
- 10) Enter the following data the ability to follow PJM dispatch instructions:

- Economic Min
- Economic Max

11) Select the Submit action button.

The new value will change to green when successfully submitted.

12) To download selected information, select Get Report button.

13) Select “Save” when the pop-up window appears.

The file is downloaded to your local directory

Managing Unit Start-up & No Load Data

Generator Start-up & 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 start-up cost (or price), no-load cost (or price), and incremental costs (or prices).

- Start-up 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 start-up costs (or prices):
 - Hot Start-up Cost — Dollars per start when the generating unit is in a hot temperature state.
 - Intermediate Start-up Cost — Dollars per start when the generating unit in an intermediate temperature state.
 - Cold Start-up 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.

What Web Pages Do I Use?

The following web pages are used to view and modify start-up and no-load data:

- **Unit Detail** — use this web page to view and modify start-up and no-load prices for price-based units.
- **Schedule Detail** — use this web page to view and modify start-up and no-load costs for cost-based schedules and to set the start-up/no-load switch for price-based units.
- **Schedule Selection** — use this web page to view and modify start-up and no-load costs on multiple schedules simultaneously.

Change Start-up & No-Load Offers for Price-based Units

A price-based unit has the option to choose price-based or cost-based start-up 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 1200 hours March 31 for the period April 1 through September 30 and on or before 1200 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 priced based unit chooses the cost-based start-up 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 1200 hours March 31, for period April 1 through September 30.
- **Period 2** — The open enrollment for Period 2 is on or before 1200 hours September 30, for period October 1 through March 31.

Use the Unit Detail web page to change the start-up 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:

- **Per. 1 Cost Based Startup Cost — Indicates** whether or not a unit startup costs and no-load costs are cost based for Period 1.
- **Per. 1 Hot Startup Cost** — The hot temperature startup offer, specified in dollars, unit to be used during the first bi-annual period. The default value is \$0.00.
- **Per. 1 Inter Startup Cost** — The intermediate temperature state startup offer, specified in dollars, to be used during the first bi-annual period. The default value is \$0.00.
- **Per. 1 Cold Startup Cost** — The cold temperature startup offer, specified in dollars, to be used during the first bi-annual period. The default value is \$0.00.
- **Per. 1 No Load Cost** — The no load offer, specified in dollars, to be used during the first bi-annual period. The default value is \$0.00.
- **Per. 2 Cost Based Startup Cost — Indicates** whether or not a unit startup costs and no-load costs are cost based for Period 2.
- **Per. 2 Hot Startup Cost** — The hot temperature startup offer, specified in dollars, f to be used during the second bi-annual period. The default value is \$0.00.
- **Per. 2 Inter Startup Cost** — The intermediate temperature state startup offer, specified in dollars, to be used during the second bi-annual period. The default value is \$0.00.
- **Per. 2 Cold Startup Cost** — The cold temperature state startup offer, specified in dollars, to be used during the second bi-annual period. The default value is \$0.00.
- **Per. 2 No Load Cost** — The no load offer, specified in dollars, to be used during the second bi-annual period. The default value is \$0.00.

Steps:

- 1) Select the Generator button.
- 2) Select Unit tab.
- 3) Select the Unit Detail page.

The Unit Detail web page appears.

- 4) Select the desired date.
- 5) Select Change Date.
- 6) Select the desired portfolio from the Portfolio list.

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

- 7) Select the generating unit from the Units list.

The data for the selected generating unit appears on the Unit Detail web page, as reflected in the title (Unit Detail Results for "Unit Name (Unit ID)" for Date).

- 8) During the open enrollment for Period 1, enter the following data:

- Per.1 Cost Based Startup and No-Load Cost
- Per. 1 Hot Startup Cost
- Per. 1 Inter Startup Cost
- Per. 1 Cold Startup Cost
- Per. 1 No-Load Cost

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

- Per. 2 Cost Based Startup and No-Load Cost
- Per. 2 Hot Startup Cost
- Per. 2 Inter Startup Cost
- Per. 2 Cold Startup Cost
- Per. 2 No-Load Cost

- 10) Select the Submit action button.

The new value will change to green when successfully submitted.

- 11) To download selected information, select Get Report button.

- 12) Select "Save" when the pop-up window appears.

The file is downloaded to your local directory

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 start-up and no-load data elements. This is the default.

Steps:

- 1) Select the Generator button.
- 2) Select Schedules tab.
- 3) Select the Schedule Detail page.

The Schedule Detail web page appears.

- 4) Select the desired date.
- 5) Select Change Date.
- 6) Select the desired portfolio from the Portfolio list.

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

- 7) Select the generating unit from the Units list.

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

- 8) Select the desired schedule from the Schedules list.

Data for the selected schedule's information appears on the Schedule Detail web page, as reflected in the title (Unit Detail Result for "Unit Name (Unit ID) for Schedule Name" on Date).

- 9) Click the Use Startup No Load field.

A dropdown box appears.

- 10) Select the following fields:

- Yes

- 11) Select the Submit action button.

The new value will change to green when successfully submitted.

- 12) To download selected information, select Get Report button.

- 13) Select "Save" when the pop-up window appears.

The file is downloaded to your local directory

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 start up 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 start-up and no-load data elements. This is the default.

Steps:

- 1) Select the Generator button.
- 2) Select Schedules tab.
- 3) Select the Schedule Detail page.
The Schedule Detail web page appears.
- 4) Select the desired date.
- 5) Select Change Date.
- 6) Select the desired portfolio from the Portfolio list.
The generating units for the selected portfolio appear in the Units list.
- 7) Select the generating unit from the Units list.
The schedules for the selected generating unit appear in the Schedules list.
- 8) Select the desired schedule from the Schedules List.
Data for the selected schedule's information appears on the Schedule Detail web page, as reflected in the title (Schedule Detail Result for "Unit Name (Unit ID) for "Schedule Name" on Date).
- 9) Click the Use Startup No Load field.
A dropdown box appears.
- 10) Select the following fields:
 - No
- 11) Select the Submit action button.
The new value will change to green when successfully submitted.
- 12) To download selected information, select Get Report button.
- 13) Select "Save" when the pop-up window appears.
The file is downloaded to your local directory

Change Energy Market Opportunity Cost Component, Start-up & 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 eMKT 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 start-up and no-load costs for a cost-based schedule. The following rules apply to start-up and no-load offers for cost-based schedules:

- Cold Startup Cost \geq Inter Startup Cost \geq Hot Startup Cost

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

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

1) Select the Generator button.

2) Select Schedules tab.

3) Select the Schedule Detail page.

The Schedule Detail web page appears.

4) Select the desired date.

5) Select Change Date.

6) Select the desired portfolio from the Portfolio list.

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

7) Select the generating from the Units list.

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

8) Select the desired schedule from the Schedules list.

Data for the selected schedule's information appears on the Schedule Detail web page, as reflected in the title (Schedule Detail Results for "Unit Name (Unit ID)" for "Schedule Name" on "Date").

9) Enter desired changes to the following start-up and no-load data:

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

10) Select the Submit action button.

The new value will change to green when successfully submitted.

11) To download selected information, select Get Report button.

- 12) Select “Save” when the pop-up window appears.

The file is downloaded to your local directory

Modify Start-up Notification Times

Start-up notification times are changed on a schedule-basis, regardless of whether the schedule is cost-based or price-based. The following rules apply to entering start-up notification data:

- Hot to Cold Time \geq Hot to Inter Time
- Cold Notification Time \geq Inter Notification Time \geq Hot Notification Time
- Cold Startup Time \geq Inter Startup time \geq Hot Startup Time

The following information can be changed on the Schedule Detail page:

- **Hot to Cold Time (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.
- **Hot to Inter 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.
- **Hot Notification Time (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.
- **Inter Notification Time (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.
- **Cold Notification Time (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.
- **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.
- **Inter 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 intermediate temperature state. The default value is 0 hours.
- **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. The default value is 0 hours.

Steps:

- 1) Select the Generator button.
- 2) Select Schedules tab.
- 3) Select the Schedule Detail page.

The Schedule Detail web page appears.

- 4) Select the desired date.
- 5) Select Change Date.
- 6) Select the desired portfolio from the Portfolio list.

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

- 7) Select the generating unit from the Units list.

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

- 8) Select the desired schedule from the Schedules list.

Data for the selected schedule's information appears on the Schedule Detail web page, as reflected in the title (Schedule Detail Result for "Unit Name (Unit ID)" for "Schedule Name" on Date).

- 9) Enter the desired changes to the following notification times:

- Hot to Cold Time (hour)
- Hot to Inter Time (hour)
- Hot Notification Time (hour)
- Inter Notification Time (hour)
- Cold Notification Time(hour)
- Hot Startup Time (hour)
- Inter Startup Time (hour)
- Cold Startup Time (hour)

- 10) Select the Submit action button.

The new value will change to green when successfully submitted.

- 11) To download selected information, select Get Report button.

- 12) Select "Save" when the pop-up window appears.

The file is downloaded to your local directory

Managing Condenser Data

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.

What 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.

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:

- 1) Select the Generator button.
- 2) Select Unit tab.
- 3) Select the Unit Detail page.
The Unit Detail web page appears.
- 4) Select the desired date.
- 5) Select Change Date.
- 6) Select the desired portfolio from the Portfolio list.
The generating units for the selected portfolio appear in the Units list.
- 7) Select the generating unit from the Units list.
The data for the selected generating unit appears on the Unit Detail web page, as reflected in the title (Unit Detail Result for "Unit Name (Unit ID)" on Date).
- 8) Click the Use Condense Available field.
A dropdown box appears.
- 9) Select the following fields:
 - Yes
- 10) Select the Submit action button.
The new value will change to green when successfully submitted.
- 11) To download selected information, select Get Report button.
- 12) Select "Save" when the pop-up window appears.
The file is downloaded to your local directory

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 an unit is available to condense
 - Yes** — indicates the unit is available to condense
 - No** — indicates the unit is not available to condense

Steps:

- 1) Select the Generator button.
- 2) Select Unit tab.
- 3) Select the Unit Detail page.
The Unit Detail web page appears.
- 4) Select the desired date.
- 5) Select Change Date.
- 6) Select the desired portfolio from the Portfolio list.
The generating units for the selected portfolio appear in the Units list.
- 7) Select the generating unit from the Units list.
The data for the selected generating unit appears on the Unit Detail web page, as reflected in the title (Unit Detail Result for "Unit Name (Unit ID)" on Date).
- 8) Click the Use Condense Available field.
A dropdown box appears.
- 9) Select the following fields:
 - No
- 10) Select the Submit action button.
The new value will change to green when successfully submitted.
- 11) To download selected information, select Get Report button.
- 12) Select "Save" when the pop-up window appears.
The file is downloaded to your local directory

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:

- 1) Select the Generator button.
- 2) Select Unit tab.
- 3) Select the Unit Detail page.
The Unit Detail web page appears.
- 4) Select the desired date.
- 5) Select Change Date.
- 6) Select the desired portfolio from the Portfolio list.
The generating units for the selected portfolio appear in the Units list.
- 7) Select the generating unit from the Units list.
The data for the selected generating unit appears on the Unit Detail web page, as reflected in the title (Unit Detail Result for "Unit Name (Unit ID)" on Date).
- 8) Enter the desired changes to the following constraint data:
 - Condense Notification Time (\$)
 - Condense Energy Use (MW)
 - Condense Startup Cost (\$)
 - Condense to Gen Cost (\$)
 - Condense Hourly Cost (\$/hour)
- 9) Select the Submit action button.
The new values will change to green when successfully submitted.
- 10) To download selected information, select Get Report button.
- 11) Select "Save" when the pop-up window appears.
The file is downloaded to your local directory

Managing Generating Unit Schedules

Generating Unit Schedules Overview

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

- Create or modify a type of schedule
- Modify schedule-specific data, which includes MW operating limits, constraint data, and market participation (day-ahead or balancing)
- Create or modify schedule offer data (MW and price)
- Select schedule(s) to be available

What Web Pages Do I Use?

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

- **Schedule Manager** — use this web page to create types of schedules.
- **Schedule Detail** — use this web page to view and modify schedule parameters, such as unit start-up costs, condensing information, cancellation costs, and market participation
- **Schedule Offer** — use this web page to view and modify schedule segment offers.
- **Schedule Selection** — use this web page to select generating unit schedules.

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 – 89** — cost-based schedules
 - 90** — historic LMP schedule
 - 91 – 99** — price-based schedules

Steps:

- 1) Select the Generator button.
- 2) Select Schedules tab.
- 3) Select the Schedule Manager page.
The Schedule Manager web page appears.
- 4) Select the desired portfolio from the Generation Portfolios List.
The generating units for the selected portfolio appear in the Units List.
- 5) Select the desired unit from the Units List.

The existing schedule types for the selected generating unit appear. (Schedule Manager for “Unit Name (Unit ID)”)

- 6) Select the Add action button.

A new row appears on the web page.

- 7) Enter the following data:

- Schedule Name
- Description

- 8) Click outside the entry box.

The new value will change to red.

- 9) Select the Submit action button.

The new value will change to green and the line is highlighted yellow when successfully submitted.

The schedule's name appears in the Schedules List on the following web pages:

- Schedule Detail
- Schedule Offers

- 10) To download selected information, select Get Report button.

- 11) Select “Save” when the pop-up window appears.

The file is downloaded to your local directory.

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:

- 1) Select the Generator button.
- 2) Select Schedules tab.
- 3) Select the Schedule Manager page.

The Schedule Manager web page appears.

- 4) Select the desired portfolio from the Generation Portfolios List.

The generating units for the selected portfolio appear in the Units List.

- 5) Select the desired unit from the Units List.

The existing schedule types for the selected generating unit appear. (Schedule Manager for "Unit Name (Unit ID)")

- 6) Select the schedule type that you want to modify.

The line is highlighted green.

- 7) Select and Modify the following data:

- Schedule Name
- Description

- 8) Click outside the entry box.

The new value will change to red.

- 9) Select the Submit action button.

The new value will change to green and the line is highlighted yellow when successfully submitted.

The schedule's name appears in the Schedules List on the following web pages:

- Schedule Detail
- Schedule Offers

- 10) To download selected information, select Get Report button.

- 11) Select "Save" when the pop-up window appears.

The file is downloaded to your local directory.

Delete a Schedule Type

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

Steps:

- 1) Select the Generator button.

- 2) Select Schedules tab.

- 3) Select the Schedule Manager page.

The Schedule Manager web page appears.

- 4) Select the desired portfolio from the Generation Portfolios List.

The generating units for the selected portfolio appear in the Units List.

- 5) Select the desired unit from the Units List.

The existing schedule types for the selected generating unit appear. (Schedule Manager for "Unit Name (Unit ID)")

- 6) Select the schedule type that you want to delete.

The line is highlighted green.

- 7) Select the Delete action button.

The value will change to red.

- 8) Click outside the entry box.

A row will disappear from the web page.

- 9) Select the Submit action button.

The new value will change to green and the line is highlighted yellow when successfully submitted.

The schedule's name appears in the Schedules List on the following web pages:

- *Schedule Detail*
- *Schedule Offers*

- 10) To download selected information, select Get Report button.

- 11) Select "Save" when the pop-up window appears.

The file is downloaded to your local directory

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.

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 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 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.
- **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.

Steps:

- 1) Select the Generator button.
- 2) Select Schedules tab.
- 3) Select the Schedule Manager page.

The Schedule Manager web page appears.

- 4) Select the desired date.
- 5) Select Change Date.
- 6) Select the desired portfolio from the Generation Portfolios List.
The generating units for the selected portfolio appear in the Units List.
- 7) Select the desired unit from the Units List.
The existing schedule types for the selected generating unit appear.
- 8) Select the desired schedule from the Schedules List.
The schedule detail for the selected schedule appears, as reflected in the title (Schedule Detail Results for "Unit Name (Unit ID) for "Schedule Name" on Date).
- 9) Select and enter data for the following operating limits:
 - Emergency Max (MW)
 - Economic Max (MW)
 - Economic Min (MW)
 - Emergency Min (MW)
- 10) Select the Submit action button.
The new value will change to green when successfully submitted.
- 11) To download selected information, select Get Report button.
- 12) Select "Save" when the pop-up window appears.

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:

- 1) Select the Generator button.
- 2) Select Schedules tab.
- 3) Select the Schedule Manager page.
The Schedule Manager web page appears.
- 4) Select the desired date.
- 5) Select Change Date.
- 6) Select the desired portfolio from the Generation Portfolios List.
The generating units for the selected portfolio appear in the Units List.
- 7) Select the desired unit from the Units List.
The existing schedule types for the selected generating unit appear.
- 8) Select the desired schedule from the Schedules List.
The schedule detail for the selected schedule appears, as reflected in the title (Schedule Detail Results for “Unit Name (Unit ID)” for “Schedule Name” on Date).
- 9) Enter the desired changes to the following constraint data:
 - Minimum Downtime (hour)
 - Minimum Runtime (hour)
 - Maximum Weekly Starts
 - Maximum Runtime (hour)
 - Maximum Daily Starts
 - Maximum Weekly Energy (MWh)
- 10) Select the Submit action button.
The new value will change to green when successfully submitted.
- 11) To download selected information, select Get Report button.
- 12) Select “Save” when the pop-up window appears.

Set Schedule's Market Participation Switches

Another schedule parameter available is the market participation switches. The Operating Company selects the schedules that are available for the day-ahead market and selects the schedules that are available for the balancing market.

The day-ahead market closes at 1200 noon. The re-bidding period for the balancing market is from 1600 to 1800, daily. An offer that is accepted for the day-ahead market automatically carries over into the balancing market. Units that are not scheduled in the day-ahead market can re-submit the unit into the balancing market.

The Operating Company marks schedules available for the day-ahead market and the balancing market using the Schedule Detail web page. This can be done when the schedule detail information is initially determined. The following information is used:

- **Day-ahead Market** — Indicates whether the schedule is available for the day-ahead market.
- **Balancing Market** — Indicates whether or not the schedule is available for the balancing market (used for re-bidding period).
- **Both** — Indicates whether or not the schedule is available for both the day-ahead market and balancing market (used for re-bidding period). This is the default.

Steps:

- 1) Select the Generator button.
- 2) Select Schedules tab.
- 3) Select the Schedule Detail page.
The Schedule Detail web page appears.
- 4) Select the desired date.
- 5) Select Change Date.
- 6) Select the desired portfolio from the Generation Portfolios List.
The generating units for the selected portfolio appear in the Units List.
- 7) Select the desired unit from the Units List.
The existing schedule types for the selected generating unit appear.
- 8) Select the desired schedule from the Schedules List.
The schedule detail for the selected schedule appears, as reflected in the title (Schedule Detail Results for “Unit Name (Unit ID” for “ Schedule Name” on Date).
- 9) To mark a schedule to participate in the day-ahead market, select the Market Type. Enter the desired changes to the following constraint data:
 - ◆ DayAhead
- 10) Select the Submit action button.
The new value will change to green when successfully submitted.
- 11) To make a schedule available for the balancing market, select the Market Type. Enter the desired changes to the following constraint data:
 - ◆ Balancing
- 12) Select the Submit action button.

The new value will change to green when successfully submitted.

- 13) To make a schedule available for both the balancing market and day ahead market, select the Market Type. Enter the desired changes to the following constraint data:

- ◆ Both

- 14) Select the Submit action button.

The new value will change to green when successfully submitted.

- 15) To download selected information, select Get Report button.

- 16) Select “Save” when the pop-up window appears.

Create 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 dollars/MW price offer for this segment. The default value is \$0.00. Value may be negative.

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:

- 1) Select the Generator button.
- 2) Select Schedules tab.
- 3) Select the Schedule Offers page.

The Schedule Offers web page appears.

- 4) Select the desired date.
- 5) Select Change Date.

- 6) Select the desired portfolio from the Generation Portfolios List.
The generating units for the selected portfolio appear in the Units List.
- 7) Select the desired unit from the Units List.
The existing schedule types for the selected generating unit appear.
- 8) Select the desired schedule from the Schedules List.
The schedule detail for the selected schedule appears, as reflected in the title (Schedule Offers for “Unit Name (Unit ID)” for Schedule Name” on Date).
- 9) Enter the following data for the schedule:
 - MW
 - Price
- 10) Select the Submit action button.
The new value will change to green when successfully submitted.
- 11) To indicate that you want the offer slope to be used, perform the following steps:
- 12) Left click the Use Offer Slope field.
A ✓ appears in the field with a dotted line around the field.
- 13) Select the Submit action button.
The new value will change to green when successfully submitted.
- 14) To download selected information, select Get Report button.
- 15) Select “Save” when the pop-up window appears.

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 in both the day-ahead market and in the balancing market. Only one prices-based schedule can be made available in both the day-ahead market and in the balancing market.

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 number. The S part of the CPTUS code. This is the Schedule Type field entered on the Schedule Manager web page
- **Schedule Name** — The full name of a unit schedule. This is the Description field entered on the Schedule Manager web page.
- **Market Type** — Indicates the market type.
 - **DayAhead** — Reflects the status of the day-ahead market switch (as set on the Schedule Details web page).
 - **Balancing** — Reflects the status of the balancing market switch (as set on the Schedule Details web page).

- **Available** — 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. This is the default.
- **No Load Cost** — allows the user to modify the No Load Cost field from one web page.
- **Hot Start Cost** — allows the user to modify the Hot Start Cost field from one web page.
- **Inter Start Cost** — allows the user to modify the Inter Start Cost field from one web page.
- **Cold Start Cost** — allows the user to modify the Cold Start Cost field from one web page.

Steps:

- 1) Select the Generator button.
- 2) Select Schedules tab.
- 3) Select the Schedule Selection page.
The Schedule Selection web page appears.
- 4) Select the desired date.
- 5) Select Change Date.
- 6) Select the desired portfolio from the Generation Portfolios List.
The generating units for the selected portfolio appear.
- 7) Select the desired unit from the Units List.
The existing schedule types for the selected generating unit appear.
- 8) Click the Available field for all units in the portfolio that you desire to select.
A ✓ appears in the field with a dotted line around the field.
- 9) Select the Submit action button.
The new value will change to green when successfully submitted.
- 10) To download selected information, select Get Report button.
- 11) Select "Save" when the pop-up window appears.

Parameter Limited Schedules

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 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.

Parameters limits are determined on a unit-class basis and are assigned to each unit for the following schedule parameters:

- Minimum Downtime
- Minimum Runtime
- Maximum Daily Starts
- Maximum Weekly Starts.
- Turn Down Ratio

What Web Pages Do I Use?

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

- **Participant Parameter Limits** — use this web page to view parameter limits for all units in a participant portfolio
- **Exception Parameter Limits** — use this web page to submit a parameter limit exception requests

View Parameter Limited Values by Unit Class

The Participant Parameter Limits 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 unit class the generating unit is assigned.
- **Economic Min (MW)** — Economic Max value as displayed on Schedule Detail page.
- **Economic Max (MW)** — Economic Max value as displayed on Schedule Detail page.
 - **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.
 - **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 exceed the defined Turn Down Ratio for the PJM-defined unit class, unless an exception is granted.

View Participant Parameter Limits

- 1) Select the Generator button.
- 2) Select Parameter Limits tab.
- 3) Select the Participant Parameter Limits page.
The Participant Parameter Limits web page appears.
- 4) Select the desired portfolio from the Generation Portfolios List.
The generating units for the selected portfolio appear.
- 5) Select the desired unit from the Units List.
- 6) Select the desired Date
- 7) Review the following information:
 - Location
 - Description
 - Minimum Downtime
 - Minimum Runtime
 - Maximum Daily Starts
 - Maximum Weekly Starts
 - Turn Down Ratio
- 8) To download selected information, select Get Report button.
- 9) Select “Save” when the pop-up window appears.
The file is downloaded to your local directory.

Submit Exception Parameter Limits

The Exception Parameter Limits web page is used to submit a parameter limit exception request. On a daily basis, each generation supplier may submit notification to PJM that changed physical operational limitations at the unit require a temporary exception to the unit’s parameters. Each generation supplier must supply the required unit operating data in support of the exception.

The process and timeline for submitting a daily exception is as follows:

- By 10 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 eMKT to change the parameter limit for the next operating day
 - Daily Exception Requests should be submitted via eMKT
- By 4 pm prior to operating day (close of the DAM)
 - PJM must receive a complete exception request that includes:

- Unit Name
- Parameter Limit Requested
- Reason for Daily Exception Request
- eDart ticket
- Justification for Daily 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.

If PJM does not receive a complete exception request, and the unit did not clear in the DAM, the unit schedule will returned to its previous parameter limits. Such exceptions will be accepted, but will be subject to after-the-fact review by PJM, and the MMU provided that the after-the-fact review shall be limited to the continuation of the exception. If physical conditions at the unit change such that the exception is no longer required, the generation supplier is obligated to inform PJM and the exception will be terminated.

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** – exception requests submitted in eMKT are made on a daily basis.
- **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.
- **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 is the override to the default Economic Max Limit (as defined on the Unit Detail web page) for this schedule.
 - **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.
 - **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 exceed the defined Turn Down Ratio for the PJM-defined unit class, unless an exception is granted.

- **Justification** — submitted by generation to justify a temporary exception to the unit's parameters
- **Status** — An status of an exception request may be Pending, Approved, Denied, and Withdrawn.
- **eDart Ticket Number** — eDart Ticket Number for unit outage.

Steps:

1) Select the Generator button.

2) Select Parameter Limits tab.

3) Select the Exception Parameter Limits page.

The Exception Parameter Limits web page appears.

4) Select the desired portfolio from the Generation Portfolios List.

The generating units for the selected portfolio appear.

5) Select the desired unit from the Units List.

6) Select the desired Start Date

7) Select the desired End Date

8) Select the desired Request Type

9) Select the Create action button.

A Request Parameter Limits pop-up window appears with the following fields populated

- Portfolio
- Unit
- Start Date
- End Date
- Request Type

10) On the Request Parameter Limits pop-up window, enter the following data:

- Minimum Downtime
- Minimum Runtime
- Maximum Daily Starts
- Maximum Weekly Starts
- Turn Down Ratio
- Justification
- eDart Ticket

11) Select the Submit action button.

The new row with a Request Id will appear when successfully submitted.. The Status of the Request will be Pending.

- 12) To download selected information, select Get Report button.
- 13) Select "Save" when the pop-up window appears.

View Parameter Limited Schedule Exception Requests

- 14) Select the Generator button.
- 15) Select Parameter Limits tab.
- 16) Select the Exception Parameter Limits page.
The Exception Parameter Limits web page appears.
- 17) Select the desired portfolio from the Generation Portfolios List.
The generating units for the selected portfolio appear.
- 18) Select the desired unit from the Units List.
- 19) Select the desired Start Date
- 20) Select the desired End Date
- 21) Select the desired Request Type
- 22) Review the following information:
 - Portfolio
 - Unit
 - Start Date
 - End Date
 - Request Type
 - Economic Minimum
 - Economic Maximum
 - Minimum Downtime
 - Minimum Runtime
 - Maximum Daily Starts
 - Maximum Weekly Starts
 - Turn Down Ratio
 - Status
 - Justification
 - eDart Ticket
- 23) To download selected information, select Get Report button.
- 24) Select "Save" when the pop-up window appears.
The file is downloaded to your local directory.

Managing Regulation Data

Regulation Data Overview

Managing regulation offers is accomplished by performing the following general steps:

- Entering regulation limits
- Submitting a regulation offer, including selecting the status of the regulating unit
- Submitting a regulation bilateral

The PJM eMKT is also used to collect the information that is needed for bilateral transactions.

What 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 Updates** — use this web page to modify regulation resource availability and parameters on an hourly basis
- **Regulation Bilateral Transactions** — use this web page to facilitate a regulation bilateral transaction.

Enter Regulation Limits

A regulation offer consists of the following data: regulation capability, regulation price, regulation maximum limit, regulation minimum limit, and regulation status. 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.

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:

- 1) Select the Generation button.
- 2) Select the Unit tab.
- 3) Select the Unit Detail page.
The Unit Detail web page appears.
- 4) Select the desired date.
- 5) Select Change Date.
- 6) Select the desired portfolio from the Portfolio list.

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

- 7) Select the generating from the Units list.

The data for the selected generating unit appears in the Unit Detail web page, as reflected in the title (Unit Detail Result for “Unit Name (Unit ID)” on Date).

- 8) Enter the following regulation limits:

- Regulation Max MW
- Regulation Min MW

- 9) Select the Submit action button.

The new values will change to green when successfully submitted.

- 10) To download selected information, select Get Report button.

- 11) Select “Save” when the pop-up window appears.

The file is downloaded to your local directory

Submit 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. A regulation offer consists of the following pieces of data:

- **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.
- **Offer Price** — The 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.
- **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.
- **Reg Min** — Minimum generation limit when unit is providing regulation.
- **Reg Max** — Maximum generation limit when unit is providing regulation.
- **Min MW** — Minimum regulation amount that may be assigned.

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.

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

Steps:

- 1) Select the Generator button.
- 2) Select the Regulation Market tab.

- 3) Select the Regulation Offers page
The Regulation Offers web page appears.
- 4) Select the desired date.
- 5) Select Change Date.
- 6) Select the desired portfolio from the Portfolio list.
The generating units for the selected portfolio appear in the Location list.
- 7) Select the generating from the Location list.
The data for the selected generating unit appears in the Regulation Offer's web page.
- 8) Enter the following regulation offer data:
 - Offer MW
 - Offer Price
 - Area
 - Reg Min
 - Reg Max
 - Min MW
- 9) Select one of the following regulating statuses for each offer:
 - Self Scheduled
 - Available
 - Not Available
- 10) Select the Submit action button.
The new values will change to green when successfully submitted.
- 11) To download selected information, select Get Report button.
- 12) Select "Save" when the pop-up window appears.
The file is downloaded to your local directory

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 eMKT. 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.

Enter 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. All data must be entered no later than 1200 noon the day after the transaction begins.

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 Date** — Indicates the date the regulation bilateral transaction begins.
- **Start Hour** — Indicates the hour the regulation bilateral transaction begins, identified by the time at the end of the hour.
- **Stop Date** — Indicates the date the regulation bilateral transaction ends.
- **Stop Hour** — Indicates the hour the regulation bilateral transaction ends, identified by the time at the end of the hour.
- **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:

- 1) Select the Generator button.
- 2) Select the Regulation Market tab.
- 3) Select the Regulation Bilaterals page.
The Regulation Bilaterals web page appears.
- 4) Select the desired date.
- 5) Select Change Date.
The selected date's existing regulation bilateral transactions appears.
- 6) Select the Add action button.
A new row appears on the web page.
- 7) Select the Sellers Name from the Participant Selector.
The seller's name appears in the Seller field.
- 8) Enter the following data:

- MW
- Start Date
- Hour
- Stop Date
- Hour
- Area

9) Select the bilateral transactions to be submitted.

10) Select the Submit action button.

The new values will change to green when successfully submitted.

11) To download selected information, select Get Report button.

12) Select “Save” when the pop-up window appears.

The file is downloaded to your local directory

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. The following information is entered:

- **C** — This field is used to confirm the bilateral transaction information that was entered by the regulation buyer.
 - ✓ — The bilateral transaction is confirmed.
 - The bilateral transaction is not confirmed. This is the default.

Steps:

1) Select the Generator button.

2) Select the Regulation Market tab.

3) Select the Regulation Bilaterals page.

The Regulation Bilaterals web page appears.

4) Select the desired date.

5) Select Change Date.

The selected date's existing regulation bilateral transactions appears.

6) Left click the C field.

A ✓ appears in the field with a dotted line around the field.

7) Select the bilateral transactions to be submitted.

- 8) Select the Submit action button.
The new values will change to green when successfully submitted.

- 9) To download selected information, select Get Report button.

- 10) Select “Save” when the pop-up window appears.

The file is downloaded to your local directory

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.

Steps:

- 1) Select the Generator button.

- 2) Select the Regulation Market tab.

- 3) Select the Regulation Bilaterals page.

The Regulation Bilaterals web page appears.

- 4) Select the desired date.

- 5) Select Change Date.

The selected date's existing regulation bilateral transactions appears.

- 6) Select the bilateral transactions to be deleted.

- 7) Select the Delete action button.

The new values will change to green when successfully submitted.

- 8) To download selected information, select Get Report button.

- 9) Select “Save” when the pop-up window appears.

The file is downloaded to your local directory

Managing Synchronized Reserve Data

Synchronized Reserve Data Overview

Managing Synchronized Reserve offers is accomplished by performing the following general steps:

- Entering Synchronized Reserve limits
- Submitting a Synchronized Reserve offer, including energy use for condensing Tier 2 resources

The PJM eMKT is also used to collect the information that is needed for bilateral transactions.

What 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 Offers** — use this web page to create Synchronized Reserve offers for Tier 2 resources and modify the status of the Synchronized Reserve offer.
- **Synchronized Updates** — use this web page to modify synchronized reserve resource availability and parameters on an hourly basis
- **Synchronized Bilaterals** — use this web page to facilitate a Synchronized Reserve bilateral transaction.

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. The Synchronized Max field also appears on the Synchronized Reserve Offer web page, but cannot be modified.

Steps:

- 1) Select the Generation button.
- 2) Select the Unit tab.
- 3) Select the Unit Detail page.

The Unit Detail web page appears.

- 4) Select the desired date.
- 5) Select Change Date.
- 6) Select the desired portfolio from the Portfolio list.

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

- 7) Select the generating from the Units list.

The data for the selected generating unit appears in the Unit Detail web page, as reflected in the title (Unit Detail Result for "Unit Name (Unit ID)" on Date).

- 8) Enter the following Synchronized Reserve limits:
 - Synchronized Max

- 9) Select the Submit action button.

The new values will change to green when successfully submitted.

- 10) To download selected information, select Get Report button.

- 11) Select “Save” when the pop-up window appears.

The file is downloaded to your local directory

Submit Synchronized 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 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.
- **Full Load Heat Rate** — The heat rate of the unit, specified in BTU/kWh, when the unit is at full load.
- **Reduced Load Heat Rate** — The heat rate of the unit, specified in BTU/kWh, when the unit is at reduced load.
- **VOM Rate** — The variable rate, in dollars, of operating and maintenance costs.
- **Spin as Condenser** — Used to identify if a combustion turbine can be committed for synchronized as a condenser or dispatchable.

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:

- 1) Select the Generator button.
- 2) Select the Synchronized Reserve Market tab.
- 3) Select the Synchronized Offers page

The Synchronized Offers web page appears.

- 4) Select the desired portfolio from the Portfolio list.
The generating units for the selected portfolio appear in the Location list.
- 5) Select the desired date.
- 6) Select Change Date.
- 7) Select the generating from the Unit list.
The data for the selected generating unit appears on the Synchronized Offers web page.
- 8) Enter the following synchronized offer data:
 - Offer MW
 - Offer Price
 - Condense Energy Use
 - Condense Startup Cost
 - Condense to Gen Cost
 - Full Load Heat Rate
 - Reduced Load Heat Rate
 - VOM Rate
 - Spin as Condense
 - Condense Avail Status
- 9) Select the Submit action button.
The new values will change to green when successfully submitted.
- 10) To download selected information, select Get Report button.
- 11) Select “Save” when the pop-up window appears.
The file is downloaded to your local directory

Adjust Synchronized Reserve Resource 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 eMKT. 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.

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 Available Status column.

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

Enter a Synchronized Reserve 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. All data must be entered no later than 1200 noon the day after the transaction begins.

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** — Indicates the date the Synchronized Reserve bilateral transaction begins.
- **Stop Date** — Indicates the hour the synchronized bilateral transaction begins, identified by the time at the end of the hour.
- **Stop Date** Indicates the date the Synchronized Reserve bilateral transaction ends.
- **Stop Hour** — Indicates the hour the synchronized bilateral transaction ends, identified by the time at the end of the hour.
- **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:

- 1) Select the Generator button.
- 2) Select the Synchronized Reserve Market tab.
- 3) Select the Synchronized Reserve Bilaterals page.
The Synchronized Reserve Bilaterals web page appears.
- 4) Select the desired date.
- 5) Select Change Date.
The selected date's existing synchronized reserve bilateral transactions appears.
- 6) Select the Add action button.
A new row appears on the web page.
- 7) Select the Sellers Name from the Participant Selector.
The seller's name appears in the Seller field.
- 8) Enter the following data:
 - MW
 - %

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

9) Select the bilateral transactions to be submitted.

10) Select the Submit action button.

The new values will change to green when successfully submitted.

11) To download selected information, select Get Report button.

12) Select “Save” when the pop-up window appears.

The file is downloaded to your local directory

Confirm a Synchronized Reserve 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 synchronized reserve bilateral transactions. The seller confirms the transaction.

The seller confirms the transaction information using the Synchronized Reserve Bilaterals web page. The following information is entered:

- — This field is used to confirm the bilateral transaction information that was entered by the Synchronized Reserve buyer.
 - ✓ — The bilateral transaction is confirmed.
 - The bilateral transaction is not confirmed. This is the default.

Steps:

1) Select the Generator button.

2) Select the Synchronized Reserve Market tab.

3) Select the Synchronized Reserve Bilaterals page.

The Synchronized Reserve Bilaterals web page appears.

4) Select the desired date.

5) Select Change Date.

The selected date's existing synchronized bilateral transactions appears.

6) Left click the C field.

A ✓ appears in the field with a dotted line around the field.

- 7) Select the bilateral transactions to be submitted.
- 8) Select the Submit action button.
The new values will change to green when successfully submitted.
- 9) To download selected information, select Get Report button.
- 10) Select “Save” when the pop-up window appears.
The file is downloaded to your local directory

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.

Steps:

- 1) Select the Generator button.
- 2) Select the Synchronized Reserve Market tab.
- 3) Select the Synchronized Reserve Bilaterals page.
The Synchronized Reserve Bilaterals web page appears.
- 4) Select the desired date.
- 5) Select Change Date.
The selected date's existing Synchronized Reserve bilateral transactions appears.
- 6) Select the bilateral transactions to be deleted.
- 7) Select the Delete action button.
The new values will change to green when successfully submitted.
- 8) To download selected information, select Get Report button.
- 9) Select “Save” when the pop-up window appears.
The file is downloaded to your local directory

Managing Hourly Unit Data

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).

What 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.

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.
- **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.
- **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:

- 1) Select the Generator button.
- 2) Select the Unit tab.
- 3) Select the Unit Hourly Updates page.
The Unit Hourly Updates web page appears.
- 4) Select the current Operating Day.
- 5) Select Change Date.
- 6) Select the desired portfolio from the Portfolio list.
- 7) The generating units for the selected portfolio appear in the Units list.
- 8) Select the generating from the Units list.

The data for the selected generating unit appears on the Unit Hourly Updates web page, as reflected in the title (Unit Hourly Updates for "Unit Name (Unit ID)" on Date).

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

10) Enter data for the following operating limits:

- Emergency Max. MW
- Economic Max. MW
- Economic Min. MW
- Emergency Min. MW

11) Select the Submit action button.

The new values will change to green when successfully submitted.

12) To download selected information, select Get Report button.

13) Select “Save” when the pop-up window appears.

The file is downloaded to your local directory

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:

- 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 is 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:

- 1) Select the Generator button.
- 2) Select the Unit tab.
- 3) Select the Unit Hourly Updates page.

The Unit Hourly Updates web page appears.

- 4) Select the current Operating Day.
- 5) Select Change Date.
- 6) Select the desired portfolio from the Portfolio list.
- 7) The generating units for the selected portfolio appear in the Units list.
- 8) Select the generating from the Units list.

The data for the selected generating unit appears on the Unit Hourly Updates web page, as reflected in the title (Unit Hourly Updates for "Unit Name (Unit ID)" on Date).

- 9) Select from the Hour pulldown list the range of hours for which you wish to modify the unit status.
- 10) Select one of the following statuses:
 - Unavailable
 - Economic
 - Emergency
 - Must Run
 - Fixed Gen
 - Notification Time

- 11) Select the Submit action button.

The new values will change to green when successfully submitted.

- 12) To download selected information, select Get Report button.

- 13) Select "Save" when the pop-up window appears.

The file is downloaded to your local directory

Revise Regulating Status & Operating Limits

If the Operating Company needs to revise the regulating capability or the regulating limits to reflect real-time changes, the following information on the Regulation Updates web page is entered:

- **Hour** — A trading interval of one hour, identified by the time at the end of that hour.
- **MW** — The amount of regulation MW offered for the unit. This value overrides the Regulation Capacity (entered on the Unit Detail web page) for this generating unit. The regulating capability may be increased or decreased, but it may not be increased or decreased above or below the unit's Regulation High and Low limits.
- **Regulation High MW** — The highest level of energy, in MW, that the operating company operates the unit while it is providing regulation. This value overrides the Regulation High Limit (entered on the *Unit Detail* web page) for this generating unit.
- **Regulation Low MW** — The lowest level of energy, in MW, that the operating company operates the unit while it is providing regulation. This value overrides the Regulation Low Limit (entered on the Unit Detail web page) for this generating unit.

Steps:

- 1) Select Generator button.
- 2) Select Regulation Market tab.
- 3) Select Regulation Updates page.
The Regulation Updates web page appears.
- 4) Select the current Operating Day.
- 5) Select Change Date.
- 6) Select the generating from the Units list.
The data for the selected generating unit appears on the Regulation Updates web page, as reflected in the title (Regulation Updates for "Unit Name (Unit ID)" on Date).
- 7) Select from the Hourly Values pulldown list the range of hours for which you wish to modify the the operating limits.
- 8) Enter data for the following operating limits:
 - MW
 - Regulation High MW
 - Regulation Low MW
- 9) Select the Submit action button.
The new values will change to green when successfully submitted.
- 10) To download selected information, select Get Report button.
- 11) Select "Save" when the pop-up window appears.
The file is downloaded to your local directory

Revise the Regulating Status of a Generating Unit

During the Operating Day, the Operating Company can revise the regulating status of the generating unit. The following information is unit status information is presented on the Regulation Updates web page:

- Available Status
 - **Unavailable** — Indicates whether a unit is available to provide regulation.
 - **Available**— Indicates whether the unit is available to provide regulation.
 - **Self Scheduled** — Indicates that the generating unit is self-scheduled to provide regulation.

Only one of the above three statuses may be selected for a unit at a time

- **Spilling** — Indicates that the hydro plant associated with this unit is currently in the spilling condition.

Steps:

- 1) Select Generator button.
- 2) Select Regulation Market tab.
- 3) Select Regulation Updates page.

The Regulation Updates web page appears.

- 4) Select the current Operating Day.
- 5) Select Change Date.
- 6) Select the generating from the Units list.

The data for the selected generating unit appears on the Regulation Updates web page, as reflected in the title (Regulation Updates for "Unit Name (Unit ID)" on Date).

- 7) Select from the Hourly Value pulldown list the range of hours for which you wish to modify the unit status.
- 8) Select one of the following fields:
 - Unavailable
 - Available
 - Self Schedule
 - Spilling

- 9) Select the Submit action button.

The new values will change to green when successfully submitted.

- 10) To download selected information, select Get Report button.
- 11) Select "Save" when the pop-up window appears.

The file is downloaded to your local directory

Revise Synchronized Reserve Status & Operating Limits

If the Operating Company needs to revise the Synchronized Reserve capability or the Synchronized Reserve limits to reflect real-time changes, the following information on the Synchronized Reserve Updates web page is entered:

- **Hour** — A trading interval of one hour, identified by the time at the end of that hour.
- **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.
- **Spin Max** — 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 value overrides the Spin Maximum Limit (entered on the Unit Detail web page) for this generating unit.

Steps:

- 1) Select the Generator button.
- 2) Select the Synchronized Reserve Market tab.
- 3) Select the Synchronized Reserve Updates page.

The Synchronized Reserve Updates web page appears.

- 4) Select the current Operating Day.
- 5) Select Change Date.

- 6) Select the generating from the Units list.

The data for the selected generating unit appears on the Synchronized Reserve Updates web page, as reflected in the title (Synchronized Reserve Updates for "Unit Name (Unit ID)" on Date).

- 7) Select from the Hourly Value pulldown list the range of hours for which you wish to modify the unit operating limits.

- 8) Enter data for the following operating limits:

- Offer MW
- Spin Max

- 9) Select the Submit action button.

The new values will change to green when successfully submitted.

- 10) To download selected information, select Get Report button.

- 11) Select "Save" when the pop-up window appears.

The file is downloaded to your local directory

Revise the Synchronized Reserve Status of a Generating Unit

During the Operating Day, the Operating Company can revise the Synchronized Reserve status of the generating unit. The following information is unit status information is presented on the Synchronized Reserve Updates web page:

- Available Status —
 - **Unavailable** — Indicates whether a unit is available to provide Synchronized Reserve.
 - **Available** — Indicates whether the unit is available to provide Synchronized Reserve.
 - **Self Scheduled MW** — Indicates that the generating unit is self-scheduled to provide Synchronized Reserve.

Only one of the above statuses may be selected for a unit at a time

Steps:

- 1) Select the Generator button.
- 2) Select the Synchronized Reserve Market tab.
- 3) Select the Synchronized Reserve Updates page.

The Synchronized Reserve Updates web page appears.

- 4) Select the current Operating Day.
- 5) Select Change Date.
- 6) Select the generating from the Units list.

The data for the selected generating unit appears on the Synchronized Reserve Updates web page, as reflected in the title (Synchronized Reserve Updates for "Unit Name (Unit ID)" on Date).

- 7) Select from the Hourly Value pulldown list the range of hours for which you wish to modify the unit status.

8) Select one of the following fields:

- Available Status
- Self Scheduled MW

9) Select the Submit action button.

The new values will change to green when successfully submitted.

10) To download selected information, select Get Report button.

11) Select "Save" when the pop-up window appears.

The file is downloaded to your local directory

Managing Demand Portfolios

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

What 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.

View Existing Demand Portfolios

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

- Demand Bids
- Demand Market Results
- Inc Offers
- Dec Bids
- Virtual 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:

1) Select any of the following pages:

- Demand Bids
- Demand Market Results
- Inc Offers
- Dec Bids
- Virtual Market Results

- 2) Select the desired portfolio from the Portfolio list.

The pricing nodes for the selected portfolio appear in the Location List.

- 3) Review the defined pricing nodes in the Location list for the selected portfolio.

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:

- 1) Select the Admin button.

- 2) Select the Portfolio Manager tab.

The Portfolio Manager web page appears.

- 3) Select the Create New Portfolio action button.

A new row appears.

- 4) Enter the new portfolio's name in the Portfolio field.

- 5) Select the Demand button.

- 6) Select the Add action button.

A new row appears.

- 7) Begin typing the pricing node name and a filter list of pricing nodes will appear. Highlight the desired pricing node in the Location Name list.

- 8) Click outside entry box.

The color changes to red and the selected pricing node appears in the Location Name field.

- 9) Select the Submit action button.

The color changes to green and the line is highlighted yellow. The pricing node has been added to portfolio successfully.

- 10) Select the User Setup tab.

- 11) Select the "Submit Changes and Refresh Cache" button.

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:

- 1) Select the Admin button.
- 2) Select the Portfolio Manager tab.
The Portfolio Manager web page appears.
- 3) Select and highlight the portfolio's name in the Portfolio field.
- 4) Select the Add action button.
A new row appears.
- 5) Begin typing the pricing node name and a filter list of pricing nodes will appear. Highlight the desired pricing node in the Location List.
- 6) Click outside entry box.
The color changes to red and the selected pricing node appears in the Location Name field.
- 7) Select the Submit action button.
The color changes to green and the line is highlighted yellow. The pricing node has been added to portfolio successfully.
- 8) Select the User Setup tab.
- 9) Select the "Submit Changes and Refresh Cache" button.

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:

- 1) Select the Admin button.
- 2) Select the Portfolio Manager tab.
The Portfolio Manager web page appears.
- 3) Select and highlight the portfolio's name in the Portfolio field.
- 4) Select the Delete Portfolio action button.
The portfolio disappears from the Portfolio list.
- 5) Select the User Setup tab.
- 6) Select the "Submit Changes and Refresh Cache" button.

Delete Price Node from a Demand Portfolio

A demand user can remove a price node from a defined demand portfolio.

Steps:

- 1) Select the Admin button.
- 2) Select the Portfolio Manager tab.
The Portfolio Manager web page appears.
- 3) Select and highlight the portfolio's name in the Portfolio field.
- 4) Select a pricing node by click in the box at the left.
The row color will change to light green.
- 5) Select the Delete action button.
The row disappears and the pricing node is deleted
- 6) Select the Submit action button.
- 7) Select the User Setup tab.
- 8) Select the "Submit Changes and Refresh Cache" button.

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.

What 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.

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:

- 1) Select the Demand button.
- 2) Select the Market Results tab.
- 3) Select the Demand Market Results page.
The Demand Market Results web page appears.
- 4) Select the desired portfolio from the Portfolio List.
The list of pricing nodes included in the selected portfolio appears in the Location List.
- 5) Select the desired date.
- 6) Select Change Date.
The selected Operating Day's day-ahead demand schedules and LMPs will appear.
- 7) Review the following information for each pricing node in the portfolio for each hour:
 - Location
 - MWs
 - Prices
 - Total Portfolio MW
- 8) To download selected information, select Get Report button.
- 9) Select "Save" when the pop-up window appears.
The file is downloaded to your local directory

Managing Demand Bids

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.

What 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
- **Demand Bids** — use this web page to submit fixed and price-sensitive demand bids

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:

- 1) Select the Demand button.
- 2) Select the Distribution Factors tab.
- 3) Select the Distribution Factors page.
The Distribution Factors web page appears.
- 4) Select the desired date.
- 5) Select Change Date.
The selected date's distribution factors appear.
- 6) Select the desired demand portfolio from the Portfolios List.
The selected demand portfolio appears highlighted blue in the Portfolios List. The price nodes included in the portfolio appear in the Location List.
- 7) Select the desired price node from the Location List.
The data for the selected price node appears, as reflected in the title (Distribution Factors for "Location Name" on Date).
- 8) Select the factor to be revised.

An entry box will appear. Values in green may be revised.

- 9) Revise the factor.

The color of the revised value will change to red.

- 10) Select the Submit action button.

If submitted successfully, the value will change to green.

- 11) To download selected information, select Get Report button.

- 12) Select "Save" when the pop-up window appears.

The file is downloaded to your local directory

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:

- 1) Select the Demand button.

- 2) Select the Day Ahead Demand tab

- 3) Select the Demand Bids page

The Demand Bids web page appears.

- 4) Select the desired date.

- 5) Select Change Date.

- 6) Select the desired demand portfolio from the Portfolios List.

The selected demand portfolio appears highlighted blue in the Portfolios List. The price nodes included in the portfolio appear in the Location List.

- 7) Select the desired price node from the Location List.

The data for the selected price node appears, as reflected in the title (Demand bids for "Location Name" on Date).

- 8) To submit the same fixed demand for all 24 hours, perform the following steps:

- 9) Select ALL from the Hour pulldown menu.

Entry rows for all hours will appear.

- 10) Enter the MW value to the right of the Fixed Demand field.

Entered value will appear in red in Fixed Demand field,

- 11) Select All from the Apply To menu.

Entered value will appear in red in all hours.

- 12) Select the Submit action button.

The color changes from green to black when successfully submitted.

- 13) To submit the same fixed demand for hours 08-23, perform the following steps:

- 14) Select 08-23 from the Hour pulldown menu.

Entry rows for all hours 08-23 will appear.

- 15) Enter the MW value to the right of the Fixed Demand field.

Entered value will appear in red in Fixed Demand field

- 16) Select 08-23 from the Apply To Menu.

Entered value will appear in red in hours 08-23.

- 17) Select the Submit action button.

The color changes from green to black when successfully submitted.

- 18) To submit the same fixed demand for hours 24-07, perform the following steps:

- 19) Select 24-07 from the Hour pulldown menu.

Entry rows for all hours 24-07 will appear.

- 20) Enter the MW value to the right of the Fixed Demand field.

Entered value will appear in red in Fixed Demand field.

- 21) Select 24-07 from the Apply To Menu.

Entered value will appear in red in hours 24-07.

- 22) Select the Submit action button.

The color changes from green to black when successfully submitted.

- 23) To submit different fixed demand bids for each hour, perform the following steps:

- 24) Select ALL from the Hour pulldown menu.

Entry rows for all hours will appear.

- 25) Enter the MW value to the Fixed Demand field in the desired hour.

- 26) Select the Submit action button.

The color changes from green to black when successfully submitted.

- 27) To submit multiple fixed demand bids for each hour, perform the following steps:

- 28) Select the Add action button.

Entry rows for specified hour will appear.

- 29) Enter the MW value to the Fixed Demand field in the desired hour.

- 30) Select the Submit action button.

The color changes from green to black when successfully submitted.

31) To download selected information, select Get Report button.

32) Select “Save” when the pop-up window appears.

The file is downloaded to your local directory

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:

1) Select the Demand button.

2) Select the Day Ahead Demand tab.

3) Select the Demand Bids page.

The Demand Bids web page appears.

4) Select the desired date.

5) Select Change Date.

6) Select the desired demand portfolio from the Portfolios List.

The selected demand portfolio appears highlighted blue in the Portfolios List. The price nodes included in the portfolio appear in the Location List.

7) Select the desired price node from the Location List.

The data for the selected price node appears, as reflected in the title (Demand bids for “Location Name” on “Date”).

8) For price sensitive bids, enter the following information for each hour:

- MW
- Price

9) Select the Submit action button.

The color changes from green to black when successfully submitted.

10) To download selected information, select Get Report button.

11) Select “Save” when the pop-up window appears.

The file is downloaded to your local directory

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:

1) Select the Demand button.

2) Select the Day Ahead Demand tab.

3) Select the Demand Bids page.

The Demand Bids web page appears.

4) Select the desired demand portfolio from the Portfolios List.

The selected demand portfolio appears highlighted blue in 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.

The data for the selected price node appears, as reflected in the title (Demand bids for "Location Name" on Date).

6) Select the desired source date.

7) Select Change Date.

8) Select the desired future date.

9) Select Copy action button.

10) To download selected information, select Get Report button.

11) Select "Save" when the pop-up window appears.

The file is downloaded to your local directory

Managing Increment Offers & Decrement Bids

Increment Offers & 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

What 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.

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:

- 1) Select the Demand button.
- 2) Select the Virtual tab.
- 3) Select the Inc Offers page.
The Inc Offers web page appears.
- 4) Select the desired date.
- 5) Select Change Date.

- 6) Select the desired portfolio from the Portfolios List.

The selected portfolio appears highlighted blue in the Portfolios List. The price nodes included in the portfolio appear in the Location List.

- 7) Select the desired price node from the Location List.

The data for the selected price node appears, as reflected in the title (Inc Offers for "Location Name" on "Date").

- 8) Select the Add action button.

Entry rows for specified hour will appear.

- 9) Enter the following data in each desired hour:

- MW
- Price

- 10) Select the Submit action button.

The color changes from green to black when successfully submitted.

- 11) To download selected information, select Get Report button.

- 12) Select "Save" when the pop-up window appears.

The file is downloaded to your local directory.

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:

- 1) Select the Demand button.

- 2) Select the Virtual tab.

- 3) Select the Dec Bids page.

The Dec Bids web page appears.

- 4) Select the desired date.

- 5) Select Change Date.

- 6) Select the desired portfolio from the Portfolios List.

The selected portfolio appears highlighted blue in the Portfolios List. The price nodes included in the portfolio appear in the Location List.

- 7) Select the desired price node from the Location List.

The data for the selected price node appears, as reflected in the title (Dec Bids for "Location Name" on "Date").

- 8) Select the Add action button.
Entry rows for specified hour will appear.
- 9) Enter the following data in each desired hour:
 - MW
 - Price
- 10) Select the Submit action button.
The color changes from green to black when successfully submitted.
- 11) To download selected information, select Get Report button.
- 12) Select “Save” when the pop-up window appears.
The file is downloaded to your local directory.

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 Inc/Dec 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 units in the portfolio that is currently being viewed.

Steps:

- 1) Select the Demand button.
- 2) Select the Virtual tab.
- 3) Select the Virtual Market Results page.
The Virtual 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 date.
- 6) Select Change Date.
The selected Operating Day’s cleared virtual transactions & LMPs will appear.
- 7) Review the following information for each price node in the portfolio for each hour:
 - Location
 - Cleared Inc/Dec MWs

- Prices
 - Total Portfolio MW
- 8) To download selected information, select Get Report button.
 - 9) Select “Save” when the pop-up window appears.

The file is downloaded to your local directory

Copy Inc/Dec 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), in MW, for this segment. The default value is 0 MW.
- **Price** — The bid (decrement bid) or offer (increment bid) price for this segment. The default value is \$0.00.

Steps:

- 1) Select the Demand button.
- 2) Select the Virtual tab.
- 3) To Copy Inc Offers, select the Inc Offers page.
The Inc Offers web page appears.
- 4) To Copy Dec Bids, select the Dec Bids page.
The Dec Bids web page appears.
- 5) Select the desired portfolio from the Portfolios List.
The selected portfolio appears highlighted blue in the Portfolios List. The price nodes included in the portfolio appear in the Location List.
- 6) Select the desired price node from the Location List.
The data for the selected price node appears, as reflected in the title (Inc Offers/Dec bids for “Location Name” on “Date”).
- 7) Select the desired source date.
- 8) Select Change Date.
- 9) Select the desired future date.
- 10) Select Copy action button.
- 11) To download selected information, select Get Report button.
- 12) Select “Save” when the pop-up window appears.
The file is downloaded to your local directory.

Managing Up-To Transactions

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.

What 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.

Submit Up-To Transaction Bids

A valid Up-To Transaction bid consists of the following data being entered on the Up-To Transactions input web page:

- **Source and Sink** — any source and sink combination point from the file "OASIS Source/Sink List" located at <http://www.pjm.com/markets-and-operations/etools/oasis/oasis-reference.aspx> on website.
- **MW** — The Up-To Transaction Bid in MW. The default value is 0 MW.
- **Price** — The Up-To Transaction Bid price. The default value is \$0.00.

Steps:

- 1) Select the Demand button.
- 2) Select the Up To Transactions tab.
- 3) Select the Up To Transactions input page.
The Up To Transaction web page appears.
- 4) Select the desired date.
- 5) Select Change Date.
- 6) Select the New Transaction button.
- 7) 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 <http://www.pjm.com/markets-and-operations/etools/oasis/oasis-reference.aspx> on PJM website.
- 8) Select the desired hours from the hourly values apply list. Use ALL, 08-23, and 24-07 to put up-to transactions for all hours, peak hours, and off peak hours respectively.

9) Enter the following data:

- MW
- Price

10) Select the Apply button.

Rows for 24 hours will appear with MW and Price for the hours specified in step 8 in RED. Make necessary changes in MW and Price for the desired custom hours.

11) Select the Submit button.

The colour changes from RED to GREEN for the submitted hour's MW and Price values. If the source and sink combination is not valid as per the file mentioned in step 7, an error will be reported and the up-to transaction bid will not get submitted.

12) To download submitted transaction information in xml, select the Get Report Button. To download submitted transaction information in csv file, select the Get CSV Report button.

13) Select "Save" when the pop-up window appears.

The file is downloaded to your local directory.

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:

1) Select the Demand button.

2) Select the Up-To Transactions tab.

3) Select the Up-To Transactions results webpage.

4) Select Change date.

5) Select the up-to transaction for which you want to see the results from the transaction list.

6) Review the following information for the selected up-to transaction bid.

- Hour
- Cleared MW
- Source LMP
- Sink LMP

- 7) To download the result of selected transaction information in xml, select the Get Report Button. To download the result of selected transaction information in csv file. Select the Get CSV Report button.

Copy Up-To Transaction Bids

A demand user can copy up-to transaction bids from an existing day to a future day:

Steps:

- 1) Select the Demand button.
- 2) Select the Up-To Transaction tab.
- 3) To Copy Up-To Transaction bid, select the Up To Transaction Input page.
- 4) Select the desired past date under "Search Section" from which you want to copy a transaction.
- 5) Select the desired transaction which you want to copy to a future date.
- 6) Select the desired future date under the section below "Search Section".
- 7) Select the copy action button.
- 8) To download submitted transaction information in xml, select the Get Report Button. To download submitted transaction information in csv file, select the Get Report Button.
- 9) Select "Save" when the pop-up window appears.

The file is downloaded to your local directory.

Managing Load Response Portfolios

Load Response Portfolio Overview

Some users are responsible for submitting multiple load response bids for multiple load response resources. Managing this amount of data can be challenging. Load Response portfolios are a method of managing these large amounts of data by enabling Market Participants to screen information so that only load response resources of interest are displayed.

A load response portfolio is a collection of load response resources that are defined by the user. The user names each portfolio when it is created. There is currently no limit to the number of portfolios a user can create; nor is there a limit to the number of load response resources that can be "assigned" to a portfolio. The same load response resource can be assigned to more than one portfolio.

NOTE: All Load Resources must first be registered and approved in the Load Response System in eSuite before participating in eMKT for both Energy and Ancillary Services.

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

- Geographic location of load response resource
- Electric Distribution Company (EDC) of the load response resource
- Electric Supplier, or Load Serving Entity (LSE), of the load response resource.

What 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.

View Existing Load Response Portfolios

Data is filtered by load response portfolio on all Load Response web pages for Energy and Ancillary Services Markets:

You can determine the Locations and/or Resources that are currently defined for a portfolio by viewing any of these web pages and viewing the Location list.

Steps:

- 1) Select any of the following pages:
 - Day- Ahead Load Response Daily
 - Day-Ahead Load Response Hourly
 - Day-Ahead Load Response Market Results
 - Real-Time Load Response Daily
 - Real-Time Load Response Hourly
 - Real-Time Load Response Market Results
 - Regulation Offers
 - Regulation Updates
 - Regulation Bilaterals
 - Synchronized Reserve Offers
 - Synchronized Reserve Updates
 - Synchronized Reserve Bilaterals

- 2) Select the desired portfolio from the Portfolio list.

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

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

Create New Load Response Portfolios

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

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

- **Portfolio** — The name of a load response portfolio, which is a collection of load response resources. Portfolios can be used by Market Participants to filter the data presented on the web pages to show only subsets of the load response resources for which the user is responsible for submitting data.
- **Location** — The published name of the load response resource known by the participants and used for bidding. This label appears in the Location List on the Load Response web pages.

Steps:

- 1) Select the Admin button.
- 2) Select the Portfolio Manager tab.
The Portfolio Manager web page appears.
- 3) Select the Create New Portfolio action button.
A new row appears.
- 4) Enter the new portfolio's name in the Portfolio field.
- 5) Select the Load Response button.
- 6) Select the Add action button.
A new row appears
- 7) Begin typing the load response resource and a filter list of load response resources will appear. Highlight the desired load response resources in the Location Name list.
- 8) Click outside entry box.
The color changes to red and the selected load response resource appears in the Location Name field.
- 9) Select the Submit action button.
The color changes to green and the line is highlighted yellow. The unit has been added to portfolio successfully
- 10) Select the User Setup tab.
- 11) Select the "Submit Changes and Refresh Cache" button.

Add Load Response Resource to Load Response Portfolio

A user can add load response resources to existing portfolios. There is currently no limit to the number of load response resources that can be assigned to a portfolio. A load response resource can be assigned to more than one portfolio.

Steps:

- 1) Select the Admin button.
- 2) Select the Portfolio Manager tab.
The Portfolio Manager web page appears.
- 3) Select and highlight the portfolio's name in the Portfolio field.

- 4) Select the Add action button.

A new row appears

- 5) Begin typing the load response resource and a filter list of load response resources will appear. Highlight the desired load response resource in the Location List.

- 6) Click outside entry box.

The color changes to red and the selected generating unit appears in the Location Name field.

- 7) Select the Submit action button.

The color changes to green and the line is highlighted yellow. The unit has been added to portfolio successfully

- 8) Select the User Setup tab.

- 9) Select the "Submit Changes and Refresh Cache" button.

Delete Load Response Portfolio

A user can delete an entire load response portfolio or a load response resource within a portfolio. Once a portfolio is deleted, the load response resources assigned to that portfolio are deleted as well.

Steps:

- 1) Select the Admin button.

- 2) Select the Portfolio Manager tab.

The Portfolio Manager web page appears.

- 3) Select and highlight the portfolio's name in the Portfolio field.

- 4) Select the Delete Portfolio action button.

The portfolio disappears from the Portfolio list.

- 5) Select the User Setup tab.

- 6) Select the "Submit Changes and Refresh Cache" button.

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:

- 1) Select the Admin button.

- 2) Select the Portfolio Manager tab.

The Portfolio Manager web page appears.

- 3) Select and highlight the portfolio's name in the Portfolio field.

- 4) Select a load response resource by clicking the box at the left.
The row color will change to light green.
- 5) Select the Delete action button.
The row disappears and the load response resource is deleted
Select the Submit action button
- 6) Select the User Setup tab.
- 7) Select the “Submit Changes and Refresh Cache” button.

Managing Day-Ahead Load Response Bids

Day-Ahead Load Response Bid Overview

Participants, except end-use customers that have LMP-based contracts under which they have agreed to pay their LSE for the physical delivery of energy according to the hourly value of the real-time LMP as calculated by PJM, have the option to participate in the Day Ahead market. Participants in the PJM Economic Load Response Program may submit day-ahead load response bids using the MUI. A demand user can submit fixed load response bids, as well as provide bid information such as Shutdown Costs and Minimum Downtime.

What Web Pages Do I Use?

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

- **Load Response Daily** — use this web page to submit updated daily Day-Ahead load response data.
- **Load Response Hourly** — use this web page to submit used to submit updated hourly Day-Ahead load response data.
- **Load Response Market Results** — use this web page to view the Day-Ahead schedules for each load response resource, as well as day-ahead LMPs for each hour.

Update Shutdown Costs of a Load Response Resource

A Participant in the Economic Load Response Program may submit the costs to shut down the resource as part of their Load Response Bid. Shutdown costs will be expressed in dollars, and represents the fixed cost associated with committing a load response resource. Shutdown costs are optional, and will default to zero (0) if not submitted. Shutdown costs will be changeable only every six months, corresponding to the six-month periods during which price-based start-up costs may be changed for generators.

- **ShutDown Cost1** — Shutdown costs for Period 1, expressed in dollars, represent the fixed cost associated with committing a load response resource. The six month periods for shutdown costs are defined as follows: Period 1 is defined as April 1 - September 30 and Period 2 is defined as October 1 - March 31.
- **ShutDown Cost2** — Shutdown costs for Period 2, expressed in dollars, represent the fixed cost associated with committing a load response resource. The six month periods for shutdown costs are defined as follows: Period 1 is defined as April 1 - September 30 and Period 2 is defined as October 1 - March 31.

Steps:

- 1) Select the Demand button.
- 2) Select the Day-Ahead Load Response tab.
- 3) Select the Load Response Daily page.
The Load Response Daily web page appears.
- 4) Select the desired date.
- 5) Select Change Date.
- 6) Select the desired portfolio from the Portfolios List.
The selected portfolio appears highlighted blue in the Portfolios List. The load response resources included in the portfolio appear in the Location List.
- 7) Select the desired load response resource from the Location List.
The data for the selected load response resource appears, as reflected in the title (Load Response Results on "Date").
- 8) For Load Response Bids, enter the following information for each hour for each Load Response Name:
 - ShutDown Cost1
 - ShutDown Cost2
- 9) Select the Submit action button.
The new values will change to green when successfully submitted.
- 10) To download selected information, select Get Report button.
- 11) Select "Save" when the pop-up window appears.
The file is downloaded to your local directory.

Minimum Down Time of a Load Response Resource

A Participant in the Economic Load Response Program may submit the minimum amount of time the load response resource can reduce as part of their Load Response Bid. 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 Day-Ahead market.

- **Minimum Downtime** — 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 Day-Ahead market. Minimum down times are optional, and will default to zero (0) if not submitted

Steps:

- 1) Select the Demand button.
- 2) Select the Day-Ahead Load Response tab.
- 3) Select the Load Response Daily page.

The Load Response Daily web page appears.

- 4) Select the desired date.
- 5) Select Change Date.
- 6) Select the desired portfolio from the Portfolios List.

The selected portfolio appears highlighted blue in the Portfolios List. The load response resources included in the portfolio appear in the Location List.

- 7) Select the desired load response resource from the Location List.

The data for the selected load response resource appears, as reflected in the title (Load Response Results on "Date").

- 8) For Load Response Bids, enter the following information for each hour for each Load Response Name:

- Minimum DownTime

- 9) Select the Submit action button.

The new values will change to green when successfully submitted.

- 10) To download selected information, select Get Report button.

- 11) Select "Save" when the pop-up window appears.

The file is downloaded to your local directory.

Submit Day-Ahead Load Response Bids

Participants, except end-use customers that have LMP-based contracts under which they have agreed to pay their LSE for the physical delivery of energy according to the hourly value of the Real-time LMP as calculated by PJM, have the option to participate in the Day Ahead market. Participants in the Economic Load Response Program may submit a bid to reduce the load they draw from the PJM system in advance of real time operations. In the Day Ahead market, the participant may submit a Load Response Bid on behalf of a Load Response Resource for a specific KW curtailment (in minimum increments of .1 MW or 100 KW).

A load response bid consists of the following data being entered on the Load Response Daily web page:

- **Load Response Name** — the name of a load response resource that submits a bid to reduce the load they draw from the PJM system in advance of real time operations.
- **Price** — Price, in \$/MW, at which the load shall be curtailed. The default value is \$0.00.

Steps:

- 1) Select the Demand button.
- 2) Select the Day-Ahead Load Response tab.
- 3) Select the Load Response Daily page.
The Load Response Daily web page appears.
- 4) Select the desired date.
- 5) Select Change Date.
- 6) Select the desired portfolio from the Portfolios List.

The selected portfolio appears highlighted blue in the Portfolios List. The load response resources included in the portfolio appear in the Location List.

- 7) Select the desired load response resource from the Location List.

The data for the selected load response resource appears, as reflected in the title (Load Response Daily Results on "Date").

- 8) Enter the following data for each Load Response Name:

- Price

- 9) Select the Submit action button.

The new values will change to green when successfully submitted.

- 10) To download selected information, select Get Report button.

- 11) Select "Save" when the pop-up window appears.

The file is downloaded to your local directory.

Update Day-Ahead Load Response Bids

If the Market Participant wishes to revise the hourly MW values of their Day-Ahead Load Response bid, the following information on the Load Response Hourly Updates web page is entered:

- **Hour** — A trading interval of one hour, identified by the time at the end of that hour.
- **MW** — The MW bid for a specific curtailment must be a positive number, specified in minimum increments of .1 MW or 100 KW.

Steps:

- 1) Select the Demand button.
- 2) Select the Day-Ahead Load Response tab.
- 3) Select the Load Response Hourly page.

The Load Response Hourly web page appears.

- 4) Select the desired date.
- 5) Select Change Date.
- 6) Select the desired portfolio from the Portfolios List.

The selected portfolio appears highlighted blue in the Portfolios List. The load response resources included in the portfolio appear in the Location List.

- 7) Select the desired load response resource from the Location List.

The data for the selected load response resource appears, as reflected in the title (Load Response Hourly Results on "Date").

- 8) Enter the following data for each hour of each Load Response Name:

- MW

- 9) Select the Submit action button.

The new values will change to green when successfully submitted.

10) To download selected information, select Get Report button.

11) Select “Save” when the pop-up window appears.

The file is downloaded to your local directory.

View Cleared Day-Ahead Load Response Bids

Cleared load response bids are presented on the Day-Ahead Load Response webpage. The following information is presented:

- **Load Response Name** — the name of a load response resource 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 resource 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:

1) Select the Demand button.

2) Select the Day-Ahead Load Response tab.

3) Select the Load Response Market Results page.

The Load Response Market Results web page appears.

4) Select the desired date.

5) Select Change Date.

6) Review the following information:

- Load Response Name
- MW
- Price

7) To download selected information, select Get Report button.

8) Select “Save” when the pop-up window appears.

The file is downloaded to your local directory.

Managing Real-Time Dispatchable Load Response Bids

Real-Time Dispatchable Load Response Bid Overview

Participants, except end-use customers that have LMP-based contracts under which they have agreed to pay their LSE for the physical delivery of energy according to the hourly value of the real-time LMP as calculated by PJM, have the option to be dispatched by PJM in the Real-Time market. Participants in the PJM Economic Load Response

Program may real-time dispatch load response bids using the MUI. A demand user can submit a dispatchable price, as well as provide bid information such as Shutdown Costs and Minimum Downtime.

Load Response resources that the Curtailment Service Providers (CSP) intend to be dispatched by PJM are required to select yes to the Dispatchable in Real Time field on the Registration screen or include yes for the realTimeDispatch XML tag if using web services.

The Dispatchable in Real Time field on the registration screen serve the follow four purposes:

1. Dispatchable in real time market
2. Dispatchable in day ahead market
3. Participate in synchronized reserve market
4. Participate in regulation market

A load response facility may participate in only one of the above markets at a time. For participation in any one of the above markets requires selecting yes in the Dispatchable in Real Time field. The logistics for selecting the appropriate market participation is as follows:

1. Dispatchable in real time market – Dispatchable in Real Time must be selected as yes. A Load Response resource can not participates in either the synchronized reserve market or the regulation market and is made unavailable by PJM for participation in those markets.
2. Dispatchable in day ahead market - Dispatchable in Real Time must be selected as yes. A Load Response resource that clears in the day ahead market is made unavailable by PJM for the real time dispatch during the corresponding cleared day ahead hours. A Load Response resource can not participates in either the synchronized reserve market or the regulation market and is made unavailable by PJM for participation in those markets.
3. Participate in synchronized reserve market – Dispatchable in Real Time must be selected as yes. A Load Response resource that qualifies for synchronized reserve participation is made available by PJM to participate in the synchronized market and made unavailable for the real time dispatch, day ahead and regulation markets.
4. Participate in regulation market - Dispatchable in Real Time must be selected as yes. A Load Response resource that qualifies for regulation participation is made available by PJM to participate in the regulation market and made unavailable for the real time dispatch, day ahead and synchronized reserve markets.

What Web Pages Do I Use?

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

- **Load Response Daily** — use this web page to to submit updated daily real-time dispatchable load response data.
- **Load Response Hourly** — use this web page to submit used to submit updated hourly real-time dispatchable load response data.

Submit Real-Time Dispatchable Load Response Bids

Participants, except end-use customers that have LMP-based contracts under which they have agreed to pay their LSE for the physical delivery of energy according to the hourly value of the Day-Ahead or Real-time LMP as calculated by PJM, have the option to submit Real-Time Dispatchable Load Response bids. Participants in the Economic Load Response may submit a bid to reduce the load they draw from the PJM system at the direction of PJM Dispatch. In the Real-Time market, the participant may submit a Real-Time Dispatchable Load Response Bid on behalf of a Load Response Resource for a specific KW curtailment (in minimum increments of .1 MW or 100 KW).

Based on the submitted information PJM dispatch will determine if the load resource may be curtailed for the period of bid submitted. Real-Time Load Dispatchable Response Bids that are dispatched by PJM are communicated to the Curtailment Service Provider

A Real-Time Dispatchable load response bid consists of the following data being entered on the Load Response Daily web page:

- **Load Response Name** — the name of a load response resource that submits a bid to reduce the load they draw from the PJM system in advance of real time operations.
- **Price** — Price, in \$/MW, at which the load shall be curtailed. The default value is \$0.00.

Steps:

1) Select the Demand button.

2) Select the Day-Ahead Load Response tab.

3) Select the Load Response Daily page.

The Load Response Daily web page appears.

4) Select the desired date.

5) Select Change Date.

6) Select the desired portfolio from the Portfolios List.

The selected portfolio appears highlighted blue in the Portfolios List. The load response resources included in the portfolio appear in the Location List.

7) Select the desired load response resource from the Location List.

The data for the selected load response resource appears, as reflected in the title (Load Response Daily Results on "Date").

8) Enter the following data for each Load Response Name:

- Price

9) Select the Submit action button.

The new values will change to green when successfully submitted.

10) To download selected information, select Get Report button.

11) Select "Save" when the pop-up window appears.

The file is downloaded to your local directory.

Update Real-Time Dispatchable Load Response Bids

If the Market Participant wishes to revise the hourly MW values of their Real-Time Dispatchable Load Response bid, the following information on the Load Response Hourly Updates web page is entered:

- **Hour** — A trading interval of one hour, identified by the time at the end of that hour.
- **MW** — The MW bid for a specific curtailment Must be a positive number, specified in minimum increments of .1 MW or 100 KW.

Steps:

- 1) Select the Demand button.
- 2) Select the Real-Time Load Response tab.
- 3) Select the Load Response Hourly page.
The Load Response Hourly web page appears.
- 4) Select the desired date.
- 5) Select Change Date.
- 6) Select the desired portfolio from the Portfolios List.
The selected portfolio appears highlighted blue in the Portfolios List. The load response resources included in the portfolio appear in the Location List.
- 7) Select the desired load response resource from the Location List.
The data for the selected load response resource appears, as reflected in the title (Load Response Hourly Results on "Date").
- 8) Enter the following data for each hour of each Load Response Name:
 - MW
- 9) Select the Submit action button.
The new values will change to green when successfully submitted.
- 10) To download selected information, select Get Report button.
- 11) Select "Save" when the pop-up window appears.
The file is downloaded to your local directory.

Managing Regulation Data for Load Response Resources

Regulation Data Overview

Managing regulation offers for load response resources is accomplished by performing the following general steps:

- Entering regulation limits
- Submitting a regulation offer, including selecting the status of the regulating unit
- Submitting a regulation bilateral

The PJM eMKT is also used to collect the information that is needed for bilateral transactions.

What Web Pages Do I Use?

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

- **Regulation Offer** — use this web page to create regulation offers and modify the status of the regulation offer.

- **Regulation Updates**— use this web page to modify regulation resource availability and parameters on an hourly basis
- **Regulation Bilateral Transactions**— use this web page to facilitate a regulation bilateral transaction.

Enter Regulation Limits

A regulation offer for a load response resource consists of the following data: regulation capability, regulation price, regulation maximum limit, regulation minimum limit, and regulation status. Regulation limits are defined on a unit basis. The following regulating limits are entered on the Regulation Offer page

- **Regulation Max MW**— Maximum limit when resource is providing regulation.
- **Regulation Min MW**— Minimum limit when resource is providing regulation.

Maximum and minimum regulation limits fields appear only for load resources that have Regulating Capability, as defined in the primary characteristics for these resources as certified by the PJM Performance Compliance Department prior to participating in the PJM Regulation Market.

Steps:

- 1) Select the Demand button.
- 2) Select the Regulation Market tab.
- 3) Select the Regulation Offer page.
The Regulation Offer web page appears.
- 4) Select the desired date.
- 5) Select Change Date.
- 6) Select the desired portfolio from the Portfolio list.
The load resources for the selected portfolio appear in the Resource list.
- 7) Select the load resource from the Resource list.
The data for the selected load resource appears in the Regulation Offers web page, as reflected in the title (Regulation Offers Results for “Load Response Name (LoadResponse Name)” on Date).
- 8) Enter the following regulation limits:
 - Regulation Max MW
 - Regulation Min MW
- 9) Select the Submit action button.
The new values will change to green when successfully submitted.
- 10) To download selected information, select Get Report button.
- 11) Select “Save” when the pop-up window appears.
The file is downloaded to your local directory

Submit Regulation Offer

Regulating offers must be submitted for all load resources that are providing regulation, including load resources that are self-scheduling regulation or providing regulation to support a bilateral transaction. A regulation offer consists of the following pieces of data:

- **Offer MW** — The amount of regulation MW offered for the load resource. This field is required if the load resource is either Available or Self-Scheduled to provide regulation.
- **Offer Price** — The price at which regulation is offered for the load resource. If a load resource is available for regulation and no price is entered, the price will default to 0.0.
- **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.
- **Reg Min** — Minimum generation limit when load resource is providing regulation.
- **Reg Max** — Maximum generation limit when load resource is providing regulation.
- **Min MW** — Minimum regulation amount that may be assigned.

A regulation offer's status is one of the following states:

- **Self Scheduled** — Indicates if the load resource is self-scheduled for regulation.
- **Available** — Indicates if the load resource is available to provide regulation.
- **Not Available** — Indicates if the load resource is unavailable to provide regulation.

Steps:

- 1) Select the Demand button.
- 2) Select the Regulation Market tab.
- 3) Select the Regulation Offers page
The Regulation Offers web page appears.
- 4) Select the desired date.
- 5) Select Change Date.
- 6) Select the desired portfolio from the Portfolio list.
The load resources for the selected portfolio appear in the Location list.
- 7) Select the generating from the Resource list.
The data for the selected load resources appears in the Regulation Offer's web page.
- 8) Enter the following regulation offer data:
 - Offer MW
 - Offer Price
 - Area
 - Reg Min

- Reg Max
 - Min MW
- 9) Select one of the following regulating statuses for each offer:
- Self Scheduled
 - Available
 - Not Available
- 10) Select the Submit action button.
- The new values will change to green when successfully submitted.*
- 11) To download selected information, select Get Report button.
- 12) Select “Save” when the pop-up window appears.
- The file is downloaded to your local directory*

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 eMKT. 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.

Enter 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. All data must be entered no later than 1200 noon the day after the transaction begins.

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 Date** — Indicates the date the regulation bilateral transaction begins.
- **Start Hour** — Indicates the hour the regulation bilateral transaction begins, identified by the time at the end of the hour.
- **Stop Date** — Indicates the date the regulation bilateral transaction ends.

- **Stop Hour** — Indicates the hour the regulation bilateral transaction ends, identified by the time at the end of the hour.
- **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:

- 1) Select the Demand button.
- 2) Select the Regulation Market tab.
- 3) Select the Regulation Bilaterals page.
The Regulation Bilaterals web page appears.
- 4) Select the desired date.
- 5) Select Change Date.
The selected date's existing regulation bilateral transactions appears.
- 6) Select the Add action button.
A new row appears on the web page.
- 7) Select the Sellers Name from the Participant Selector.
The seller's name appears in the Seller field.
- 8) Enter the following data:
 - MW
 - Start Date
 - Hour
 - Stop Date
 - Hour
 - Area
- 9) Select the bilateral transactions to be submitted.
- 10) Select the Submit action button.
The new values will change to green when successfully submitted.
- 11) To download selected information, select Get Report button.
- 12) Select "Save" when the pop-up window appears.
The file is downloaded to your local directory

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. The following information is entered:

- — This field is used to confirm the bilateral transaction information that was entered by the regulation buyer.
 - ✓ — The bilateral transaction is confirmed.
 - The bilateral transaction is not confirmed. This is the default.

Steps:

- 1) Select the Demand button.
- 2) Select the Regulation Market tab.
- 3) Select the Regulation Bilaterals page.
The Regulation Bilaterals web page appears.
- 4) Select the desired date.
- 5) Select Change Date.
The selected date's existing regulation bilateral transactions appears.
- 6) Left click the C field.
A ✓ appears in the field with a dotted line around the field.
- 7) Select the bilateral transactions to be submitted.
- 8) Select the Submit action button.
The new values will change to green when successfully submitted.
- 9) To download selected information, select Get Report button.
- 10) Select "Save" when the pop-up window appears.
The file is downloaded to your local directory

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.

Steps:

- 1) Select the Demand button.
- 2) Select the Regulation Market tab.
- 3) Select the Regulation Bilaterals page.
The Regulation Bilaterals web page appears.
- 4) Select the desired date.
- 5) Select Change Date.
The selected date's existing regulation bilateral transactions appears.
- 6) Select the bilateral transactions to be deleted.
- 7) Select the Delete action button.
The new values will change to green when successfully submitted.
- 8) To download selected information, select Get Report button.
- 9) Select "Save" when the pop-up window appears.
The file is downloaded to your local directory

Managing Synchronized Reserve Data for Load Resources

Synchronized Reserve Data for Load Resources Overview

Managing Synchronized Reserve offers for Load Resources is accomplished by performing the following general steps:

- Submitting a Synchronized Reserve offer

The PJM eMKT is also used to collect the information that is needed for bilateral transactions.

What Web Pages Do I Use?

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

- **Synchronized Offers** — use this web page to create Synchronized Reserve offers for Tier 2 resources and modify the status of the Synchronized Reserve offer for load resources.
- **Synchronized Updates** — use this web page to modify synchronized reserve resource availability and parameters on an hourly basis
- **Synchronized Bilaterals** — use this web page to facilitate a Synchronized Reserve bilateral transactions.

Submit Synchronized Offer for Load Resources

Synchronized offers must be submitted for all load resources that are providing Synchronized Reserve, including load resources 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 \$.75/MWh margin.

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:

- 1) Select the Demand button.
- 2) Select the Synchronized Reserve Market tab.
- 3) Select the Synchronized Reserve Offers page
The Synchronized Reserve Offers web page appears.
- 4) Select the desired portfolio from the Portfolio list.
The load resources for the selected portfolio appear in the Resource List.
- 5) Select the desired date.
- 6) Select Change Date.
- 7) Select the generating from the Resource list.
The data for the selected load resources appears on the Synchronized Reserve Offers web page.
- 8) Enter the following synchronized reserve offer data:
 - Offer MW
 - Offer Price
 - Available Status
- 9) Select the Submit action button.
The new values will change to green when successfully submitted.
- 10) To download selected information, select Get Report button.
- 11) Select "Save" when the pop-up window appears.
The file is downloaded to your local directory

Adjust Synchronized Reserve Resource 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 eMKT. 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.

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 Available Status column.

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

Enter a Synchronized Reserve 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. All data must be entered no later than 1200 noon the day after the transaction begins.

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**— Indicates the date the Synchronized Reserve bilateral transaction begins.
- **Stop Date** — Indicates the hour the synchronized bilateral transaction begins, identified by the time at the end of the hour.
- **Stop Date** Indicates the date the Synchronized Reserve bilateral transaction ends.
- **Stop Hour** — Indicates the hour the synchronized bilateral transaction ends, identified by the time at the end of the hour.
- **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:

- 1) Select the Demand button.
- 2) Select the Synchronized Reserve Market tab.
- 3) Select the Synchronized Bilaterals page.
The Synchronized Bilaterals web page appears.

- 4) Select the desired date.
- 5) Select Change Date.
The selected date's existing synchronized bilateral transactions appears.

- 6) Select the Add action button.
A new row appears on the web page.

7) Select the Sellers Name from the Participant Selector.

The seller's name appears in the Seller field.

8) Enter the following data:

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

9) Select the bilateral transactions to be submitted.

10) Select the Submit action button.

The new values will change to green when successfully submitted.

11) To download selected information, select Get Report button.

12) Select "Save" when the pop-up window appears.

The file is downloaded to your local directory

Confirm a Synchronized 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 synchronized bilateral transactions. The seller confirms the transaction.

The seller confirms the transaction information using the Synchronized Bilaterals web page. The following information is entered:

- — This field is used to confirm the bilateral transaction information that was entered by the Synchronized Reserve buyer.
 - ✓ — The bilateral transaction is confirmed.
 - The bilateral transaction is not confirmed. This is the default.

Steps:

13) Select the Generator button.

14) Select the Synchronized Reserve Market tab.

15) Select the Synchronized Bilaterals page.

The Synchronized Bilaterals web page appears.

- 16) Select the desired date.
- 17) Select Change Date.
The selected date's existing synchronized bilateral transactions appears.
- 18) Left click the C field.
A ✓ appears in the field with a dotted line around the field.
- 19) Select the bilateral transactions to be submitted.
- 20) Select the Submit action button.
The new values will change to green when successfully submitted.
- 21) To download selected information, select Get Report button.
- 22) Select "Save" when the pop-up window appears.
The file is downloaded to your local directory

Delete a Synchronized 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.

Steps:

- 23) Select the Generator button.
- 24) Select the Synchronized Reserve Market tab.
- 25) Select the Synchronized Bilaterals page.
The Synchronized Bilaterals web page appears.
- 26) Select the desired date.
- 27) Select Change Date.
The selected date's existing Synchronized Reserve bilateral transactions appears.
- 28) Select the bilateral transactions to be deleted.
- 29) Select the Delete action button.
The new values will change to green when successfully submitted.
- 30) To download selected information, select Get Report button.
- 31) Select "Save" when the pop-up window appears.
The file is downloaded to your local directory

Managing Transaction Thresholds

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.

What 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.

Set threshold limits for Virtual Transactions

A registered eMKT 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 Bids MW Threshold**— The MW quantity set as a threshold for all Dec Bids.

Steps:

- 1) Select the Admin button.
- 2) Select the User Setup tab.
- 3) Select the Threshold Settings page.
The Threshold Settings web page appears.
- 4) Update the following information:
 - Inc Offer MW Threshold
 - Dec Bids MW Threshold
- 5) Select the Submit Demand and Inc/Dec Threshold Settings action button.

Set threshold limits for Fixed Demand and Price Sensitive Demand Bids

A registered eMKT 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:

- 1) Select the Admin button.
- 2) Select the User Setup tab.
- 3) Select the Threshold Settings page.
The Threshold Settings web page appears.
- 4) For each Location, update the following information:
 - Fixed MW Threshold
 - Price Sensitive MW Threshold
- 5) Select the Submit Demand and Inc/Dec Threshold Settings action button.

Downloading & Posting XML Files

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 in the Internet. Section 2 of this User Guide describes the displays.
- **XML-formatted File Exchange**— input and output files can be posted and downloaded using the MUI or other participant-created application.

What 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 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.

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:

- Ancillary Service Market Prices
- Binding Limits
- Demand Summary

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

Steps:

- 1) Select the Public button.
- 2) Select the Reports tab.
- 3) Select the Report Download page.
The Report Download web page appears.
- 4) Select the desired date.
- 5) Select Change Date.
- 6) Select desired report(s):
 - Ancillary Service Market Prices
 - Binding Limits
 - Demand Summary
 - Interface Limits
 - Market Prices
 - Messages
 - Net Tie Schedule
 - Node List
 - Regulation Results
 - Synchronized Reserve Results

The select report (s) will be highlighted green.

- 7) To download selected report, select Get Report button.
- 8) Select "Save" when the pop-up window appears.

The file is downloaded to your local directory.

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 Ancillary Service Market Prices
- 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:

- 1) Select the Admin button.
- 2) Select the XML tab.
- 3) Select the Query Upload page
The Query Upload web page appears.
- 4) Select the Browse action button.
Your local directory appears.
- 5) Select desired file from local directory.
- 6) Select the Submit action button.

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:

- 1) Select the Admin button.
- 2) Select the XML tab.
- 3) Select the Submit Upload page
The Submit Upload web page appears.
- 4) Select the Browse action button.
Your local directory appears.
- 5) Select desired file from local directory.
- 6) Select the Submit action button.

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 Ancillary Service Market Prices
- 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:

- 1) Select the Admin button.
- 2) Select the XML tab.
- 3) Select the Query Upload page
The Query Upload web page appears.
- 4) Select the Browse action button.
Your local directory appears.
- 5) Select desired file from local directory.
- 6) Select the Submit action button.

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:

- 1) Select the Admin button.
- 2) Select the XML tab.
- 3) Select the Submit Upload page
The Submit Upload web page appears.
- 4) Select the Browse action button.
Your local directory appears.
- 5) Select desired file from local directory.
- 6) Select the Submit action button.

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:

- 1) Select the Admin button.
- 2) Select the XML tab.

- 3) Select the Query by Transaction Upload page
The Query by Transaction Upload web page appears.
- 4) Select the Browse action button.
Your local directory appears.
- 5) Select desired file from local directory.
- 6) Select the Submit action button.

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 eMKT 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 Agreementⁱ.

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.ⁱⁱ

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 timeⁱⁱⁱ

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 eMKT

Go to: <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 eMKT.

eSUITE > Login > Upload > E-mail

Customer Support
If you have any questions, please call the Member Relations Hotline at 610-666-8960 or 866-400-8960.

PJM eTools

PJM Interconnection's eTools, including eSuite, are a group of sophisticated Internet-based software applications that allow members to transact much of their business online. Using PJM's eTools gives members real-time data about the electric system. They can buy and sell power, arrange transmission service, schedule contract purchases, carry out business strategies and make critical business decisions.

Welcome to the new, streamlined eTools login page. PJM has upgraded the page to make it more useful for members. The page continues to provide access to PJM's eTools. It adds easy access to documentation, eSuite account information and other eTool information.

This is the training website.

System Requirements
The minimum system requirements are those necessary to run the Windows 95 or Windows NT operating systems. [<More>](#)
[Internet Explorer 7.0 Settings](#)
[Internet Explorer 8 Settings](#)

General eTool Information
[eSuite Sandbox Registration Procedures](#)
[eSuite FAQ](#)

My Account
Change my password, edit my information and view my account history.
My Account

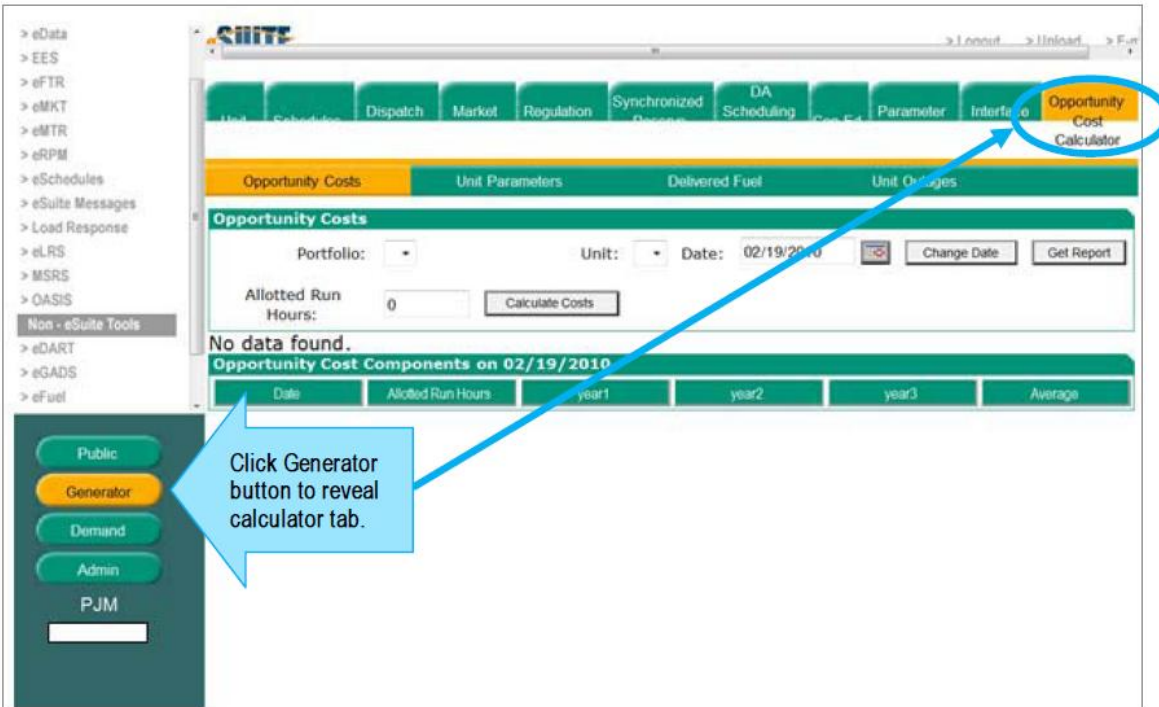
Tool Documentation
PJM offers information about eTools, including user guides, manuals and frequently asked questions (FAQ). Each eTool page has links to detailed information about that tool.
Go to...

New Users Registration
Startup form for first-time eTools Participant Company (primary account) - use "CAM Form A" [Participant Authorization Form](#) (Required Once)
Startup form for Non-Participant Company seeking access to Power Contracts Bulletin Board - use "CAM Form A-1" [Bulletin Board Authorization Form](#) (Required Once)
Startup and subsequent changes to designation of CAM(s) and additional tools access - use "CAM Form B" [CAM Designation Form](#) (Required For Each Request)
eSuite New User

Click button to apply for PJM eSuite account.

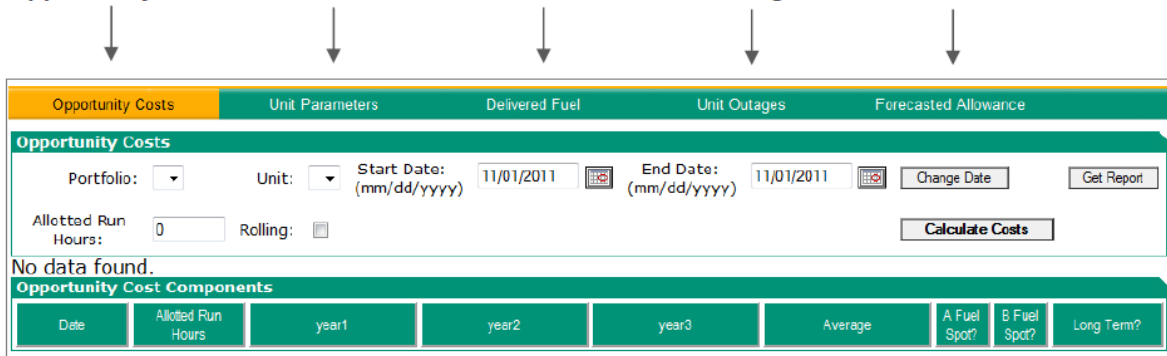
Step 2: Opening the Opportunity Cost Calculator

Once you have logged in, click on the Generator button in the lower left corner. The tab to the Opportunity Cost Calculator will appear in the in the upper right. It is the last tab in the row.



Once you click on the Opportunity Cost Calculator tab, it will open the calculator page and you will find five sub-pages:

Once you click on the Opportunity Cost Calculator tab, it will open the calculator page and you will find five sub-pages:
Opportunity Costs, Unit Parameters, Delivered Fuel, Unit Outages and Forecasted Allowance.



Step 3: Start on the Unit Parameter Tab

To begin, go to the Unit Parameters Tab, choose your portfolio and unit and enter the start date as the date for which you are calculating opportunity cost, usually the next operating day; then click Change Date.

Opportunity Costs **Unit Parameters** Delivered Fuel Unit Outages Forecasted Allowance

Unit Parameters

Portfolio: 1 - ALL UNITS Unit: Unit Date: 01/04/2012 (mm/dd/yyyy)

Pages: 1 Records: 1 - 1 of 1 matches.

Unit Parameters for on 01/04/2012

Unit Name	Heat Rate (MMBtu/MWh)	(null)	VOM (\$/MWh)	(null)	CO2 Rate (Lbs/MMBtu)	(null)
SO2 Rate (Lbs/MMBtu)	(null)	NOX Rate (Lbs/MMBtu)	(null)	FMU Adder (\$/MWh)	(null)	Use % Adder No
Min Run Time	(null)	Start Cost	(null)	Economic Max	(null)	
A Fuel Type	(null)	A Price Type	(null)	A Fuel %	(null)	
B Fuel Type	(null)	B Price Type	(null)	B Fuel %	(null)	

The fields are defined as follows:

Heat Rate (MMBtu/MWh)	<p>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.</p> <p>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, NO_x, etc), then click submit.</p> <p>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.</p> <p>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.</p>
VOM (\$/MWh)	<p>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.</p>
CO2 Rate (Lbs/MMBtu) SO2 Rate (Lbs/MMBtu) NOX Rate (Lbs/MMBtu)	<p>Unit SO₂, CO₂, and NO_x 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.</p>

FMU Adder (\$/MWh)	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.
Use % Adder	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.
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 numbers 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.

Below is an example of filled in unit parameters after submitting. The text font is red before it is submitted then turns to green. Once it has been submitted you can navigate away from the page without losing your entries.

Unit Parameters

Portfolio: 1 - ALL UNITS Unit: Date: 01/04/2012 (mm/dd/yyyy) Get Report Change Date

Pages: 1 Records: 1 - 1 of 1 matches.

Unit Parameters for on 01/04/2012

Unit Name	CR 658610XX	VOM (\$/MWh)	2.22	CO2 Rate (Lbs/MMBtu)	117.0000
SO2 Rate (Lbs/MMBtu)	1.2000	FMU Adder (\$/MWh)	(null)	Use % Adder	Yes
Min Run Time	1	Start Cost	1000.00	Economic Max	20.00
A Fuel Type	Columbia_Gas_App	A Price Type	CONTRACT	A Fuel %	0.90
B Fuel Type	Jet_USAC	B Price Type	SPOT	B Fuel %	0.10

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.

Delivered Fuel

Portfolio: 1 - ALL UNITS Unit: Start Date: 12/27/2011 (mm/dd/yyyy) End Date: 12/27/2011 (mm/dd/yyyy) Change Date

Pages: 1 Records: 1 - 1 of 1 matches.

Monthly Delivered Fuel for

Month	Fuel Type	Desc Of Adder	Fuel Delivery Adders	Fuel Contract Price
12/01/2011	(null)	(null)	(null)	(null)

Pages: 1 Records: 1 - 1 of 1 matches.

Delivered Fuel for

Day	Fuel Type	Price Type	Delivered Fuel Price (\$/MMBTU)
12/27/2011	(null)	(null)	(null)

To begin, adjust the start date to the beginning of the period to be evaluated such as 1/1/2012 and the end date to the end of the period to be evaluated such as 11/4/12 and click change date. This will create the rows in Monthly Delivered Fuel for the future that you will then populate with data.

Next, drop down to the Monthly Delivered Fuel Section. Enter the fuel type, a description of the adder, the fuel adders and the fuel contract price. Click Submit when you have entered all lines in the block or you will lose the data when you advance to the next page. To advance to the next page click on the following page number or Next. You may also upload via XML.

Opportunity Costs Unit Parameters **Delivered Fuel** Unit Outages Forecasted Allowance

Delivered Fuel

Portfolio: 1 - ALL UNITS Unit: Start Date: 01/01/2012 End Date: 11/04/2012 Change Date

Pages: 1 2 Next Records: 1 - 10 of 11 matches.

Monthly Delivered Fuel for

Submit Download XML

Month	Fuel Type	Desc. Of Adder	Fuel Delivery Address	Fuel Contract Price
	(null)	(null)	(null)	(null)
	(null)	(null)	(null)	(null)
	(null)	(null)	(null)	(null)
	(null)	(null)	(null)	(null)
	(null)	(null)	(null)	(null)
	(null)	(null)	(null)	(null)
07/01/2012	(null)	(null)	(null)	(null)
08/01/2012	(null)	(null)	(null)	(null)
09/01/2012	(null)	(null)	(null)	(null)
10/01/2012	(null)	(null)	(null)	(null)

Click submit before advancing.

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, drop down to the Delivered Fuel for <UNIT NAME> section enter the daily historic fuel type, price type (spot or contract) and delivered fuel price in \$/mbtu to the unit . Click Submit after each page or you will lose your data. Click Next or the page number to advance to the next page. You may also use the Download XML button instead of entering each of the month's values by hand.

Opportunity Costs Unit Parameters **Delivered Fuel** Unit Outages Forecasted Allowance

Delivered Fuel

Portfolio: 1 - ALL UNITS Unit: Start Date: 01/01/2012 End Date: 11/04/2012 Change Date

Pages: 1 2 Next Records: 1 - 10 of 11 matches.

Monthly Delivered Fuel for

Submit Download XML

Month	Fuel Type	Desc Of Adder	Fuel Delivery Adders	Fuel Contract Price
01/01/2012	Columbia_Gas_App	Jan	2	76.80
02/01/2012	Columbia_Gas_App	Feb	3	85.96
03/01/2012	Columbia_Gas_App	Mar	2	74.00
04/01/2012	Columbia_Gas_App	Apr	1	68.00
05/01/2012	Columbia_Gas_App	May	1	56.90
06/01/2012	Columbia_Gas_App	Jun	1	69.00
07/01/2012	Columbia_Gas_App	Jul	1	75.00
08/01/2012	Columbia_Gas_App	Aug	1	89.00
09/01/2012	Columbia_Gas_App	Sep	1	83.00
10/01/2012	Columbia_Gas_App	Oct	1	71.00

Pages: 1 2 3 4 5 6 7 8 9 10 ... Next Records: 1 - 10 of 309 matches.

Delivered Fuel for

Submit Download XML **You do not need to click submit if you use the Download XML button.**

Day	Fuel Type	Price Type	Delivered Fuel Price (\$/MMBTU)
01/01/2012	(null)	(null)	(null)
01/02/2012	(null)	(null)	(null)
01/03/2012	(null)	(null)	(null)
01/04/2012	(null)	(null)	(null)
01/05/2012	(null)	(null)	(null)

Step 5: 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.

Opportunity Costs Unit Parameters Delivered Fuel **Unit Outages** Forecasted Allowance

Outages

Portfolio: 1 - ALL UNITS Unit: Start Date: 12/27/2011 End Date: 12/27/2011 Change Date Get Report

No data found.

Outages for

Add Delete Submit

<input type="checkbox"/>	Start Day	Start Hour	End Day	End Hour
--------------------------	-----------	------------	---------	----------

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. The outage data will turn green indicating they have been submitted properly.

If you make a mistake after an outage is submitted, click the check box then click deleted to remove the outage.

Step 6: 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 Change Date to make the change.

Then drop down to the Unit Forecasted Allowance. Click Add then enter the effective day, termination day and the remaining forecasted allowance. As you enter the values the field should be red. Click Submit. If it is successfully submitted it will turn green.

Effective Day	Termination Day	Forecasted Allowance
02/19/2012	12/31/2012	456

If you make a mistake after an allowance has been submitted, click the check box next to it. Then click Deleted to remove the entry. Forecasted Allowance Periods cannot overlap.

Step 7: 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 8: 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 eMKT.

Name	Value
Description	Cost based schedule
Market Type	Both
Use Startup No Load	Yes
Hot Startup Cost(\$)	0.00
Inter Startup Cost(\$)	0.00
Cold Startup Cost(\$)	0.00
No Load Cost(\$)	1059.90
Emergency Max(MW) Default: 237.8	238.0
Economic Max(MW) Default: 237.8	238.0
Economic Min(MW) Default: 87.1	60.0
Emergency Min(MW) Default: 58.8	60.0
Minimum Downtime(Hour)	9.00
Minimum Runtime(Hour)	15.00
Opportunity Cost Component (\$/MWH)	(null)

From navigation bar at the top of the page Choose Schedules > Schedule Detail. From the drop down box next to “Schedule” choose cost. Enter the data in the row called “Opportunity Cost Component” under the column called “Value”.

The screenshot shows the PJM eMKT interface. At the top, the 'Schedules' menu is highlighted. Below it, the 'Schedule Offers Search' form is visible, with 'Portfolio' and 'Unit' dropdowns, a 'Date' field, and a 'Schedule' dropdown set to 'COSTBASE'. Underneath, there are 'Startup Costs' fields for 'No Load', 'Cold', 'Intermediate', and 'Hot', with a checked 'Use offer slope' option. A table titled 'Schedule Offers for for schedule' displays MW increments and Price values. A blue arrow points to the Price column with the text 'Enter Opportunity Cost Component for each increment here'. The Price values are 28, 35, 38, 42, 46, 49, 51, and 54, with the 46, 49, 51, and 54 values highlighted in green.

MW	Price
270.0	28
350.0	35
450.0	38
600.0	42
	46
	49
800.0	51
801.0	54

Then you must add the Opportunity Cost Component to you cost offer for each price/mw increment.

From navigation bar at the top of the page Choose Schedules > Schedule Offers. Enter the Portfolio and Unit for which you calculated the Opportunity Cost. Enter the date and the 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.

ⁱ Page 1482-1483 Open Access Transmission Tariff (OATT)

ⁱⁱ Page 1486 PJM OATT <http://pjm.com/documents/~media/documents/agreements/tariff.ashx>

ⁱⁱⁱ PJM OA page401 <http://pjm.com/~media/documents/agreements/oa.ashx> effective 4/16/2011 - Docket #: ER11-3384-001