# PJM Manual 27:

Open Access Transmission Tariff Accounting

Revision: 98

Effective Date: June 1, 2023

Prepared by
Market Settlements Development Department

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# Approval

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## Current Revision

**Revision 98 (06/01/2023):**

- Conforming revisions to Section 8 to incorporate rules for Open-Loop Hybrid Resources as approved by FERC Docket ER22-1420-002, effective 6/1/2023.

# Introduction

Welcome to the ***PJM Manual for Open Access Transmission Tariff Accounting***. In this Introduction, you will find the following information:

- What you can expect from the PJM Manuals (see "About PJM Manuals").
- What you can expect from this PJM Manual (see "About This Manual").
- How to use this manual (see "Using This Manual").

## About PJM Manuals

The PJM Manuals are the instructions, rules, procedures, and guidelines established by the PJM for the operation, planning, and accounting requirements of PJM and the PJM Energy Market. The manuals are grouped under the following categories:

- Transmission
- PJM Energy Market
- Generation and transmission interconnection
- Reserve
- Accounting and Billing
- PJM administrative services

For a complete list of all PJM manuals, go to the Library section on PJM.com.

## About This Manual

The ***PJM Manual for Open Access Transmission Tariff Accounting*** is one of a series of manuals within the Accounting and Billing set of manuals. This manual focuses on the accounting for transmission services within the PJM Open Access Transmission Tariff.

The ***PJM Manual for Open Access Transmission Tariff Accounting*** consists of nine sections. These sections are listed in the table of contents beginning on page ii.

### Intended Audience

The intended audiences for the PJM Manual for Open Access Transmission Tariff Accounting are:

- PJM Members
- External auditors, lawyers, and regulators
- PJM accounting staff and auditing staff

### References

The References to other documents that provide background or additional detail directly related to the ***PJM Manual for Open Access Transmission Tariff Accounting*** are:

- Operating Agreement of PJM Interconnection, L.L.C.

- Transmission Owners Agreements
- PJM Manual for ***Operating Agreement Accounting (M-28)***
- PJM Manual for ***Billing (M-29)***
- PJM Manual for ***Balancing Operations (M-12)***
- PJM Manual for ***Transmission Operations (M-3)***

## Using This Manual

We believe that explaining concepts is just as important as presenting procedures. This philosophy is reflected in the way we organize the material in this manual. We start each section with an overview. Then we present details, procedures or references to procedures found in other PJM Manuals. The following provides an orientation to the manual's structure.

### What You Will Find In This Manual

- A table of contents that lists two levels of subheadings within each of the sections
- An approval page that lists the required approvals and a brief outline of the current revision
- Sections containing the specific guidelines, requirements, or procedures including PJM actions and PJM Member actions
- A section at the end detailing all previous revisions of this PJM Manual

# Section 1: Tariff Accounting Overview

Welcome to the *Tariff Accounting Overview* section of the ***PJM Manual for Open Access Transmission Tariff Accounting***. In this section, you will find the following information:

- A general description of the PJM Open Access Transmission Tariff (see "*Open Access Transmission Tariff Overview*").
- A description of the PJM Open Access Transmission Tariff accounting services (see "*Tariff Accounting Services*").

## 1.1 Open Access Transmission Tariff Overview

To be compliant with the FERC Order 888, the Transmission Owners (TO) in PJM filed with the FERC an open access transmission service tariff, called the PJM Open Access Transmission Tariff. Transmission open access provides the ability to make use of existing transmission facilities that are owned by others, in this case the TOs, in order to deliver power to customers. Transmission Service is the reservation to transport power from one point to another and all of the ancillary services that are necessary to make the transport of power possible.

The PJM TOs' transmission facilities are operated with free-flowing transmission ties. The PJM manages the operation of these facilities, in accordance with the PJM Operating Agreement.

### 1.1.1 PJM

PJM operates the Transmission System that is used to provide Transmission Service. Transmission services include Point-To-Point Transmission Service (long-term and short-term firm and non-firm) and Network Integration Transmission Service. In carrying out this responsibility, PJM performs the following functions:

- Acts as transmission provider and system operator for the PJM Region
- Maintains the OASIS
- Receives and acts on applications for transmission service
- Conducts system impact and facilities studies
- Schedules transactions
- Directs redispatch, curtailment, and interruptions
- Accounts for, collects, and disburses transmission revenues

### 1.1.2 Transmission Owners

Each TO in PJM is a signatory to the PJM Open Access Transmission Tariff. They collectively have delegated the responsibility to administer the PJM Open Access Transmission Tariff to PJM. Each TO has the responsibility to design or install transmission facilities to satisfy requests for Transmission Service under the tariff.

### 1.1.3 Transmission Customers

There are two types of Transmission Customers for whom PJM Open Access Transmission Tariff charges are determined:

- Point-to-Point Transmission Customers - entities receiving Transmission Service pursuant to the terms of the Transmission Provider’s Point-to-Point Transmission Service.
- Network Customers - entities receiving Transmission Service pursuant to the terms of the Transmission Provider's Network Integration Transmission Service.

## 1.2 Tariff Accounting Services

There are several transmission-related services for which PJM calculates charges and credits within the monthly and weekly billing statements as further described in PJM Manual 29: Billing.

PJM accounts for the following types of transmission service:

- Network Integration Transmission Service - Transmission Service provided pursuant to the rates, terms, and conditions set forth in the Tariff.
- Firm Point-to-Point Transmission Service - Transmission Service that is reserved and/or scheduled between specified Points of Receipt(s) and Point(s) of Delivery. The minimum term is one day and the maximum term is specified in the Service Agreement.
- Non-Firm Point-to-Point Transmission Service - Transmission Service that is reserved and scheduled on an as-available basis and is subject to curtailment or interruption. Non-Firm Point-To-Point Transmission Service is available on a stand-alone basis for periods ranging from one hour to one month.

PJM accounts for the following Ancillary Services, which PJM is required to provide and Transmission Customers are required to purchase:

- Scheduling, System Control and Dispatch - scheduling and administering the movement of power through, out of, or within PJM.
- Reactive Supply and Voltage Control from Generation Sources - operating generating facilities to produce reactive power to maintain transmission voltages within acceptable limits.

In addition to the services listed above, the following Ancillary Services, which PJM is required to provide to Transmission Customers that serve load within PJM, are also accounted for by PJM:

- Regulation and Frequency Response - committing on-line generation whose output is raised or lowered as necessary to follow the moment-to-moment changes in load.
- Operating Reserves - the amount of generating capacity actually operated for specified periods of an Operating Day to ensure the reliable operation of PJM.
- Energy Imbalance - provided when a difference occurs between the scheduled and actual delivery of energy to a load.
- Black Start Service - the capability of generating units to start without an outside electrical supply or the demonstrated ability of a generating unit with a high operating factor to automatically remain operating at reduced levels when disconnected from the grid.

- The regulation and frequency response service, energy imbalance service (for network customers), and operating reserves - spinning and supplemental services are billed through the Operating Agreement and, therefore, are not covered in this PJM Manual. (See the ***PJM Manual for Operating Agreement Accounting (M-28)*** for more details.)
- PJM also accounts for the following charges/credits: Expansion Cost, RTO Start-up Cost Recovery, and FERC/OPSI/CAPS/NERC/RFC/MMU//PJMSettlement fees.
- Accounting Input Data.

After-the-fact, PJM collects information regarding actual operations which is recorded by PJM dispatchers or automated systems. The tariff accounting processes use this information as input data. Other accounting input data is provided from various systems and databases. This information includes basic data describing scheduling information for Transmission Customers' transactions, and Transmission System parameters. The tariff accounting process uses this information as described in the other sections of this PJM Manual.

# Section 2: Scheduling, System Control and Dispatch Service Accounting

Welcome to the Scheduling, System Control and Dispatch Service Accounting section of the **PJM Manual for Open Access Transmission Tariff Accounting**. In this section, you will find the following information:

- A description of the scheduling, system control and dispatch service accounting (see "Scheduling, System Control and Dispatch Accounting Overview").
- How the PJM scheduling, system control and dispatch service charges are calculated for PJM Members (see "PJM Scheduling, System Control and Dispatch Service Charges").
- How the TO scheduling, system control and dispatch service charges are calculated for Transmission Customers (see "TO Scheduling, System Control and Dispatch Service Charges").
- How the TO scheduling, system control and dispatch service credits are calculated for TOs (see "TO Scheduling, System Control and Dispatch Service Credits").
- How the PJM scheduling, system control and dispatch service charge reconciliations are calculated for Network Transmission Customers (see "Reconciliation for PJM Scheduling, System Control and Dispatch Service Charges").
- How the TO scheduling, system control and dispatch service charge reconciliations are calculated for Network Transmission Customers (see "Reconciliation for TO Scheduling, System Control and Dispatch Service Charges").

## 2.1 Scheduling, System Control and Dispatch Accounting Overview

PJM scheduling, system control and dispatch service is required to schedule the movement of power through, out of, or into PJM. This service can only be provided by the operator of the PJM Region in which the transmission facilities that are used for Transmission Service are located. PJM Members, therefore, must purchase this service from PJM.

PJM scheduling, system control and dispatch service charges ("Schedule 9") are based on the costs of operating PJM. This includes the costs associated with implementing the PJM Operating Agreement, administering the PJM Open Access Transmission Tariff, and implementing the Reliability Assurance Agreements. The charges for PJM scheduling, system control and dispatch service are allocated on an unbundled basis. These costs include:

- Salary and expenses of personnel
- Facilities
- Committee activities and investigations
- Communication facilities
- Principal and/or depreciation expense
- Interest expense and financing costs
- Costs accrued for PJM Settlement, Inc.

PJM scheduling, system control and dispatch service charges (“Schedule 9” or “Schedule 10”) includes a service that PJM Settlement, Inc. provides through billing and collection services for certain costs associated with specific entities. These pass-through costs are associated with the following entities:

- Federal Energy Regulatory Commission (FERC)
- Organization of PJM States, Inc. (OPSI)
- Consumer Advocates of PJM States, Inc. (CAPS)
- Market Monitoring Unit (MMU)
- North American Electric Reliability Corporation (NERC)
- ReliabiltyFirst Corporation (FRC)

TO scheduling, system control and dispatch service charges (Schedule 1A”) are based upon certain control center facilities of the TOs also are required to provide this service. These services are purchased by Transmission Customers. The charges collected are used to reimburse the TOs for their monthly control center expenses.

## 2.2 PJM Scheduling, System Control and Dispatch Service Charges

This section describes the process of calculating the PJM scheduling, system control and dispatch service charges. These charges either represent the cost of operating PJM Interconnection, L.L.C. or the cost of specific entities requesting PJM Settlement, Inc. to collect their costs on behalf of them. The PJM scheduling, system control and dispatch service charge in any month to any PJM Member is the sum of the charges calculated for that Member under the following Service Categories or Schedules:

- Schedule 9-1: Control Area Administration Service
- Schedule 9-2: Financial Transmission Rights Administration Service
- Schedule 9-3: Market Support Service
- Schedule 9-4: Capacity Resource and Obligation Management Service
- Schedule 9-PJMSettlement: Costs of PJM Settlement, Inc.
- Schedule 9-MMU: MMU Funding
- Schedule 9-FERC: FERC Annual Charge Recovery
- Schedule 9-OPSI: OPSI Funding
- Schedule 9-CAPS: CAPS Funding
- Schedule 10-NERC: NERC Charges
- Schedule 10-RFC: RFC Charges

### 2.2.1 PJM Administrative Cost Rates

The Charges associated with the PJM administrative cost rates for PJM Scheduling, system control, and dispatch service are allocated on an unbundled basis in accordance with Schedule 9: “PJM Interconnection, L.L.C. Administrative Services” of the PJM Open Access Transmission

Tariff. For each Service Category, PJM has established criteria by which to measure each PJM Members' usage of that service. Each PJM Member's Service Category charge is calculated by multiplying that Member's monthly usage of that Service by a rate (in $ per unit of usage) for that Service Category in that month. All Service Category rates are determined by PJM monthly, based upon the costs incurred in that month for each Service Category and the formulas described for each Service Category. Adjustments to the rate and charge many be needed if an update is required in the formula. Monthly reconciliation to the rate and charge will occur as further described in Section 2.5 of this PJM Manual.

#### 2.2.1.1 Schedule 9-1: Control Area Administration Service

- This Service Category comprises all of the activities of PJM associated with preserving the reliability of the PJM Region and administering Point-to-Point Transmission Service and Network Integration Transmission Service.
- Usage of this service is defined as the sum of the Transmission Customer's actual hourly transmission use during the month, and is measured in MWh. Transmission use includes network customers' load plus losses and point-to-point customers' scheduled energy transactions.
- The Control Area Administration Service Rate is updated monthly by PJM, based on costs and transmission use for that month.
- Each Transmission Customer's Control Area Administration Service charge is equal to that customer's total transmission use for the month multiplied by the applicable Control Area Administration Service Rate.

#### 2.2.1.2 Schedule 9-2: Financial Transmission Rights Administration Service

- This Service Category comprises all of the activities of PJM associated with administering Financial Transmission Rights (FTRs).
- Usage of this service is comprised of two components. Component one is defined as the sum of the FTR holder's hourly FTR MWs for each hour of the month that the FTR is in effect, regardless of the dollar value of the FTR. Component two is defined as the number of hours associated with all bids to buy FTR Obligations submitted by the Market Participant plus five times the number of hours associated with all bids to buy FTR Options submitted by each market participant for a month. Component twois applicable to all bids submitted into any round of a Long-term or Annual FTR auction (billed monthly) and to all bids submitted into the applicable monthly FTR auctions.
- The Financial Transmission Rights Administration Service Rate component one is updated monthly by PJM, based on costs and FTR MWh for that month. The Financial Transmission Rights Administration Service Rate component two is updated monthly by PJM, based on costs and FTR bid/offer hours for that month.
- Each FTR holder's Financial Transmission Rights Administration Service charge is the sum of component one and component two. Component one is equal to that Member's total FTR MWh for the month multiplied by the Financial Transmission Rights Administration Service Rate component one. Component two is equal to the number of hours in all bids to buy FTR Obligations submitted by the Market Participant for that month plus five times the number of hours in all bids to buy FTR Options submitted

by each Market Participant for a month multiplied by the Financial Transmission Rights Administration Service Rate component two.

#### 2.2.1.3 Schedule 9-3: Market Support Service

- This Service Category comprises all of the activities of PJM associated with supporting the operation of the PJM Interchange Energy Market and related functions.
- Component one usage has three different areas in where usage is defined.
    - Usage for Transmission Customers is defined as the sum of the Network Transmission Customer's hourly energy delivered to serve load (including losses) in PJM plus the Point-to-Point Transmission Customer's hourly energy exported out of PJM (excluding wheeling transactions) for all hours of the month.
    - Usage for Generation Providers is defined as the sum of the hourly energy input into the PJM Transmission System from generation facilities in PJM, plus the Network Transmission Customer's hourly energy imported into PJM, plus the Point-to-Point Transmission Customer's hourly energy imported into PJM (excluding wheeling transactions), plus the Market Seller's hourly energy delivered for import to the boundaries of PJM for sale to the PJM Spot Market for all hours of the month.
    - Usage for Market Participants that submit offers to sell or bids to buy energy in the PJM Interchange Energy Market is defined as the total quantity in MWh of all cleared Increment offers, Decrement bids and "up-to" congestion bids during the month.
- Component two usage is defined as the number of bid/offer segments submitted by the market participant.
    - A bid/offer segment equals each price/quantity pair submitted into the Day-ahead Energy Market.
    - Segments are computed hourly for each fixed or price sensitive Demand bid, each Increment offer, and each Decrement bid.
    - Segments are computed daily for each generation offer (including offers submitted into the generation rebidding period).
    - Bid/offer segments used to schedule day-ahead Point-to-Point energy transactions into, out of, or through PJM, including "up-to" congestion bids and pseudo-tie bids, may be in single hour or multi-hour periods, provided that the submitted MW value remains unchanged for the duration of the period and that the period does not cross from one day into another.
- The Market Support Service Rate component one is updated monthly by PJM, based on costs and energy MWh for that month. The Market Support Service Rate component two is updated monthly by PJM, based on costs and the number of bid/offers for that month.
- Each PJM Market Participant's Market Support Service charge is the sum of component one and component two. Component one is equal to a Market Participant's total Transmission Customer MWh usage for the month plus a Market Participant's total Generation Provider MWh usage for the month plus a Market Participant's total cleared bid/offer MWh for the month multiplied by the Market Support Service Rate component one. Component two is equal to a Market Participant's all bid/offer segments submitted into the Day-ahead Energy Market (including offers submitted into the

generation rebidding period) for the month multiplied by the Market Support Service Rate component two.

#### 2.2.1.4 Schedule 9-4: Capacity Resource and Obligation Management Service

- This Service Category comprises the activities of PJM associated with (a) assuring that members have arranged for sufficient generating capacity to meet their capacity obligations under the PJM Open Access Transmission Tariff (OATT), Attachment DD, (b) processing Network Integration Transmission Service, (c) administering the PJM capacity markets, and (d) administering and providing technical support for the Reliability Assurance Agreement (RAA). These activities are performed through the PJM Capacity Exchange internet-based customer interactive tool.
- Usage of this service is defined as the sum of the Load-Serving Entity's monthly Accounted-for Obligations during the month (including FRRs) and the Capacity Resource Owner's Unforced Capacity measured in MWd.
- The Capacity Resource and Obligation Management Service Rate is updated monthly by PJM, based on costs and usage for that month.
- Each PJM Load Serving Entity (LSE) Capacity Resource and Obligation Management Service charge is equal to that PJM LSE's total Daily Unforced Capacity Obligation for the month multiplied by that month's Capacity Resource and Obligation Management Service Rate. Each PJM Capacity Resource owner, included FRR Capacity Plan, Capacity Resource and Obligation Management Service charge is equal to that PJM Capacity Resource owner's share of Unforced Capacity MWs for the month multiplied by that month's Capacity Resource and Obligation Management Service Rate

#### 2.2.1.5 Schedule 9-PJMSettlement: PJM Settlement, Inc. Administrative Services

- This schedule recovers the expenses of PJM Settlement, Inc. commencing with the establishment of PJM Settlement, Inc., through two components. Sixty-eight percent of these expenses are recovered through component one of Schedule 9-PJM Settlement, while thirty-two percent of these expenses are recovered through component two of Schedule 9-PJM Settlement.
- Component one usage is defined by the number of invoices that PJM Settlement, Inc. issues in each month, based on the date on which the invoice was issued rather than the month in which the settled activity occurred. An invoice will be excluded from this invoice count if the only activity it contains is a Schedule 9-PJMSettlement charge.
- Component two usage is based on market activity in six different areas. The usage for these areas is defined by the same calculations specified above in Schedule 9-1, Schedule 9-2, Schedule 9-3 and Schedule 9-4.
    - Schedule 9-1 = reference section 2.2.1.1 of this PJM Manual
    - Schedule 9-2, Component 1 = reference section 2.2.1.2 of this PJM Manual
    - Schedule 9-2, Component 2 = reference section 2.2.1.2 of this PJM Manual
    - Schedule 9-3, Component 1 = reference section 2.2.1.3 of this PJM Manual
    - Schedule 9-3, Component 2 = reference section 2.2.1.3 of this PJM Manual

- Schedule 9-4 = reference section 2.2.1.4 of this PJM Manual

- The PJM Settlement, Inc. Administrative Service Rates are updated monthly by PJM, based on costs. Separate rates exist for each component and sub-component.
  - The component one rate is equal to costs multiplied by 0.68, divided by total invoices issued for that month.
  - The component two rate is based on costs multiplied by 0.32 and further divided into sub-components as follows:
    - 9-PSI: Schedule 9-1 Rate = (Cost * 0.32 * 0.25) / Total Schedule 9-1 usage
    - 9-PSI: Schedule 9-2, Component 1 Rate = (Cost * 0.32 * 0.25 * 0.6) / Total Schedule 9-2, Component 1 usage
    - 9-PSI: Schedule 9-2, Component 2 Rate = (Cost * 0.32 * 0.25 * 0.4) / Total Schedule 9-2, Component 2 usage
    - 9-PSI: Schedule 9-3, Component 1 Rate = (Cost * 0.32 * 0.25 * 0.987) / Total Schedule 9-3, Component 1 usage
    - 9-PSI: Schedule 9-3, Component 2 Rate = (Cost * 0.32 * 0.25 * 0.013) / Total Schedule 9-3, Component 2 usage
    - 9-PSI: Schedule 9-4 Rate = (Cost * 0.32 * 0.25) / Total Schedule 9-4 usage
- Each customer's PJM Settlement, Inc. Administrative Service charge is the sum of the charges for component one and component two. The component one charge is equal to the component one rate times the Market Participant's component one usage for that month. The component two charge is the sum of the following:
  - Schedule 9-1 = Transmission Customer's total Schedule 9-1 usage for the month multiplied by the 9-PSI: Schedule 9-1 rate
  - Schedule 9-2, Component 1 = Market Participant's total Schedule 9-2, component 1 usage for the month multiplied by the 9-PSI: Schedule 9-2, Component 1 rate
  - Schedule 9-2, Component 2 = Market Participant's total Schedule 9-2, component 2 usage for the month multiplied by the 9-PSI: Schedule 9-2, Component 2 rate
  - Schedule 9-3, Component 1 = Market Participant's total Schedule 9-3, component 1 usage for the month multiplied by the 9-PSI: Schedule 9-3, Component 1 rate
  - Schedule 9-3, Component 2 = Market Participant's total Schedule 9-3, component 2 usage for the month multiplied by the 9-PSI: Schedule 9-3, Component 2 rate
  - Schedule 9-4 = Market Participant's total Schedule 9-4 usage for the month multiplied by the 9-PSI: Schedule 9-4 rate

### 2.2.2 PJM Pass-Through Rates

The charges associated with the PJM pass-through rates of PJM scheduling, system control, and dispatch service are allocated on an unbundled basis in accordance with the specific Schedules of the PJM Open Access Transmission Tariff (OATT). Each Schedule has a rate calculated by PJM annually based on costs provided by each specific entity to PJM. Monthly reconciliation to the rate and charge will occur as further described in Section 2.5 of this PJM Manual.

#### 2.2.2.1 Schedule 9-MMU: MMU Funding

- The Market Monitoring Unit (MMU) provides functions, as specified under the Open Access Transmission Tariff (OATT), Attachment M. PJM recovers those costs associated with the MMU providing those functions to the PJM region for the MMU.
- Component one usage has three different areas in where usage is defined.
    - Usage for Transmission Customers is defined as the sum of the estimated Network Transmission Customer's hourly energy delivered to serve load (including losses) in PJM plus the Point-to-Point Transmission Customer's estimated hourly energy exported out of PJM (excluding wheeling transactions) for all hours of the month.
    - Usage for Generation Providers is defined as the sum of the estimated hourly energy input into the PJM Transmission System from generation facilities in PJM, plus the Network Transmission Customer's estimated hourly energy imported into PJM, plus the Point-to-Point Transmission Customer's estimated hourly energy imported into PJM (excluding wheeling transactions), plus the Market Seller's estimated hourly energy delivered for import to the boundaries of PJM for sale to the PJM Spot Market for all hours of the month.
    - Usage for Market Participants is defined as the sum of the estimated offers to sell or bids to buy energy in the PJM Interchange Energy Market, which is defined as the total quantity in MWh of all cleared Increment offers, Decrement bids and "up-to" congestion bids during the month.
- Component two usage is defined as the number of bid/offer segments submitted by the market participant.
    - A bid/offer segment equals each price/quantity pair submitted into the Day-ahead Energy Market.
    - Segments are computed hourly for each fixed or price sensitive Demand bid, each Increment offer, and each Decrement bid.
    - Segments are computed daily for each generation offer (including offers submitted into the generation rebidding period).
    - Bid/offer segments used to schedule day-ahead Point-to-Point energy transactions into, out of, or through PJM, including "up-to" congestion bids and pseudo-tie bids, may be in single hour or multi-hour periods, provided that the submitted MW value remains unchanged for the duration of the period and that the period does not cross from one day into another.
- The MMU Service Rate component one is updated annually by PJM, based on MMU's estimated annual costs, which includes prior year's changes, multiplied by 0.987 and estimated energy MWhs for the year. The MMU Service Rate component two is updated annually by PJM, based on MMU's estimated annual costs, which includes prior year's changes, multiplied by 0.013 and estimated bid/offer segments for the year.
- Each PJM Market Participant's MMU Service charge is the sum of component one and component two. Component one is equal to a Market Participant's total Transmission Customer MWh usage for the month plus a Market Participant's total Generation Provider MWh usage for the month plus a Market Participant's total cleared bid/offer MWh for the month multiplied by the MMU Service Rate component one. Component

two is equal to a Market Participant's all bid/offer segments submitted into the Day-ahead Energy Market (including offers submitted into the generation rebidding period) for the month multiplied by the MMU Service Rate component two.

#### 2.2.2.2 Schedule 9-FERC: FERC Annual Charge Recover

- PJM as a public utility and the Transmission Provider under the PJM Open Access Transmission Tariff is subject to annual charges assessed by FERC in accordance with Part 382 of FERC's regulations..
- Usage for this schedule is defined as the estimated annual total hourly transmission usage under Point-to-Point Transmission Service or Network Integration Transmission Service by all customers.
- The FERC Charge Recovery Rate is updated annually by PJM, based upon FERC's estimated annual recovery cost plus any prio year changes and estimated transmission use.
- Each Transmission Customer's FERC Annual Charge Recovery cahge is equal to the customer's total quantity in MWh of energy delivered during the month using Point-to-Point Transmission Service (scheduled energy transactions) and Network Integration Transmission Service (load plus losses) multiplied by the FERC Charge Recovery Rate.

#### 2.2.2.3 Schedule 9-OPSI: OPSI Funding

- Organization of PJM States, Inc. (OPSI) submits its annual budget for the next calendar year to PJM no later than September 30. PJM posts the final Commission approved budget and rate by October 31.
- Usage for this schedule is defined as the estimated annual total hourly transmission usage under Point-to-Point Transmission Service or Network Integration Transmission Service by all customers.
- The OPSI Funding Rate is updated annually by PJM, based upon OPSI's estimated annual budget, which includes prior year changes, and estimate transmission use.
- Each Transmission Customer's OPSI Funding Charge is equal to the customer's total quantity in MWh of energy delivered during the month using Point-to-Point Transmission Service (scheduled energy transactions) and Network Integration Transmission Service (load plus losses) multiplied by the OPSI Funding Rate.

#### 2.2.2.4 Schedule 9-CAPS: CAPS Funding

- Consumer Advocates of PJM States, Inc. (CAPS) submits its annual budget for the next calendar year to PJM no later than September 30. PJM posts the final Commission approved budget and rate by October 31.
- Usage for this schedule is defined as the estimated annual total hourly transmission usage under Point-to-Point Transmission Service or Network Integration Transmission Service by all customers.
- The CAPS Funding Rate is updated annually by PJM, based upon CAPS's estimated annual budget, which includes prior year changes, and estimate transmission use.

- Each Transmission Customer's CAPS Funding Charge is equal to the customer's total quantity in MWh of energy delivered during the month using Point-to-Point Transmission Service (scheduled energy transactions) and Network Integration Transmission Service (load plus losses) multiplied by the CAPS Funding Rate.

#### 2.2.2.5 Schedule 10-NERC: North American Electric Reliability Corporation Charge

- North American Electric Reliability Corporation (NERC) submits its annual budget for the next calendar year to PJM no later than September 30. PJM posts the final Commission approved budget and rate by October 31.
- Usage for this schedule is defined as the estimated annual total hourly transmission usage under Point-to-Point Transmission Service or Network Integration Transmission Service by all customers excluding the Dominion and EKPC Zones.
- The NERC Charge Rate is updated annually by PJM, based upon NERC's estimated annual costs of operations and estimate transmission use, excluding Dominion and EKPC Zones.
- Each Transmission Customer's NERC charge is equal to the customer's total quantity of MWh of energy delivered during the month using Point-to-Point Transmission Service (schedule energy transactions) excluding the Dominion and EKPC Zones and Network Integration Transmission Service (load plus losses), excluding the Dominion and EKPC Zones, multiplied by the NERC Charge Rate. Any over or under collection of NERC's actual costs of operations for a given calendar year will be trued up via a billing adjustment each December of that year.

#### 2.2.2.6 Schedule 10-RFC: ReliabilityFirst Corporation Charge

- ReliabilityFirst Corporation (RFC) submits its annual budget for the next calendar year to PJM no later than September 30. PJM posts the final Commission approved budget and rate by October 31.
- Usage for this schedule is defined as the estimated annual total hourly transmission usage under Point-to-Point Transmission Service or Network Integration Transmission Service by all customers excluding the Dominion and EKPC Zones.
- The RFC Charge Rate is updated annually by PJM, based upon RFC's estimated annual costs of operations and estimate transmission use, excluding Dominion and EKPC Zones.
- Each Transmission Customer's NERC charge is equal to the customer's total quantity of MWh of energy delivered during the month using Point-to-Point Transmission Service (scheduled energy transaction), excluding the Dominion and EKPC Zones and Network Integration Transmission Service (load plus losses), excluding Dominion and EKPC Zones, multiplied by the RFC Charge Rate. Any over or under collection of RFC's actual costs for a given calendar year will be trued up via a billing adjustment each December of that year.

## 2.3 TO Scheduling, System Control and Dispatch Service Charges

TO scheduling, system control, and dispatch service (Schedule 1A) must be purchased by Transmission Customers. Each Transmission Customer's charge is calculated by determining the Transmission Customer's hourly zone and non-zone transmission use and using these values to determine the Transmission Customer's monthly zone and non-zone transmission use. The monthly values of all Transmission Customers are summed both by Transmission Zone and PJM Region.

Schedule 1A Zone Charge a Transmission Customer's Network load and Point-to-Point load (including losses) within a PJM Transmission Zone multiplied by the applicable zonal rate as set forth in the Open Access Transmission Tariff (OATT), Schedule 1A.

**PJM Actions**

- PJM Obtains the Transmission Owner zonal rates from Schedule 1A ($/MWh)
- PJM calculates each Transmission Customer's Network load and Point-to-Point load (MWh)
- PJM calculates the Schedule 1A Zone Charge by multiplying the Transmission Customers zonal transmission usage by the applicable rate for each applicable Transmission Zone
    - Schedule 1A Zone Charge = Transmission Customer's Zone transmission use * Zonal Rate

Schedule 1A Non-zone Charge uses a Transmission Customer's non-zone Network load and Point-to-Point energy transactions with the point of delivery at the border of PJM multiplied by the pool-wide non-zone rate as set forth in the Open Access Transmission Tariff (OATT), Schedule 1A.

**PJM Actions**

- PJM obtains the pool-wide non- zonal rate from Schedule 1A ($/MWh)
- PJM calculates each Transmission Customer's non-zone Network load and Point-to-Point energy transactions (MWh)
- PJM calculates the Schedule 1A Non-zone Charge by multiplying the Transmission Customers non-zonal transmission usage by the applicable rate.
    - Schedule 1A Non-Zone Charge = Transmission Customer's non-zone transmission use * Non-Zone Rate

## 2.4 TO Scheduling, System Control and Dispatch Service Credits

Each Transmission Owner (TO) receives a monthly TO scheduling, system control, and dispatch service credit equal to charges collected from Transmission Customers serving load in that specific TOs zone plus the TOs share of the charges collected from Transmission Customers serving non-zone load (e.g., non-zone network and point-to-point transmission customers).

- Schedule 1A Credit = Schedule 1A Zone Credit + Schedule 1A Non-Zone Credit

Schedule 1A Zone Credit for each Transmission Owner uses the total Schedule 1A Zone Charges for that Zone multiplied each TO's share of that Zone. If there is more than one Transmission Owner in a Zone with a Schedule 1A rate, then the allocation will be less than 100% for each TO.

- Schedule 1A Zone Credit = Total Zone Schedule 1A Charges * Zone Share Allocation

Schedule 1A Non-Zone Credit for each Transmission Owner uses the total Schedule 1A Non-Zone Charges multiplied by the share percentage as set forth in the Open Access Transmission Tariff (OATT), Schedule 1A.

- Schedule 1A Non-Zone Credit = Total PJM Non-Zone Schedule 1A Charges * Non-Zone Share Allocation

## 2.5 Reconciliation for PJM Scheduling, System Control and Dispatch Service Charges

PJM will calculate reconciled PJM Scheduling, System Control and Dispatch Service charges (Schedules 9 and Schedule 10) for EDCs and Retail Load Aggregators (a.k.a. Electric Generation Suppliers) for past months' billings that were based on load ratio shares. The reconciliation kWh data must be supplied to PJM by the EDCs, and represents the difference between the scheduled Retail Load Responsibility InSchedules (in MWh) and the "actual" usage based on metered data. This hourly kWh data must be reported separately for each applicable InSchedule contract. PJM calculates the PJM Scheduling, System Control and Dispatch Service charge reconciliations by multiplying the kWh data (not de-rated for transmission losses) by the applicable Schedule 9 and Schedule 10 billing determinants for that month.

The reconciliation of the PJM Scheduling, System Control and Dispatch Service charge uses two billing determinants: the Control Area Administration Service billing determinant and the Transmission Customers' Market Support Service billing determinant. The Control Area Administration Service billing determinant is equal to the Monthly Control Area Administration Service Rate that was calculated in accordance with Schedule 9-1 of the PJM Open Access Transmission Tariff for the month being reconciled. The Transmission Customers' Market Support Service billing determinant is equal to the Market Support Service Rate for Transmission Customers that was calculated in accordance with Schedule 9-3 of the PJM Open Access Transmission Tariff for the month being reconciled. Schedule 9-1 and Schedule 9-3 are sub-components in calculating Schedule 9-PJMSettlement, therefore, reconciliation to these sub-components within Schedule 9-PJMSettlement will occur at the same timeframe. Note that the reconciliation for PJM Scheduling, System Control and Dispatch Service charges for a month may be either a positive or a negative value. .

The monthly Schedule 9-MMU, 9-FERC, 9-OPSI, 9-CAPS, 10-NERC, and 10-RFC billing determinants are the applicable $/MWh rates for those services. Note that the reconciliation charges for a month may be either a positive or a negative value.

## 2.6 Reconciliation for TO Scheduling, System Control and Dispatch Service Charges

PJM will calculate reconciled TO Scheduling, System Control and Dispatch Service charges (Schedules 1A) for EDCs and Retail Load Aggregators (a.k.a. Electric Generation Suppliers) for past months' billings that were based on load ratio shares. The reconciliation kWh data must be supplied to PJM by the EDCs, and represents the difference between the scheduled Retail Load Responsibility InSchedules (in MWh) and the “actual” usage based on metered data. This hourly kWh data must be reported separately for each applicable InSchedule contract. PJM calculates the TO Scheduling, System Control and Dispatch Service charge reconciliations by multiplying the kWh data (not de-rated for transmission losses) by the applicable Schedule 1A billing determinants for that month.

The monthly TO Scheduling, System Control and Dispatch Service billing determinant is the $/MWh rate for each zone as filed in Schedule 1A of the PJM Open Access Transmission Tariff. Note that the reconciliation of TO Scheduling, System Control and Dispatch Service charges for a month may be either a positive or a negative value.

# Section 3: Reactive Supply and Voltage Control from Generation and Other Sources Service Accounting

Welcome to the Reactive Supply and Voltage Control from Generation and Other Sources Service Accounting section of the ***PJM Manual for Open Access Transmission Tariff Accounting.*** In this section, you will find the following information:

- An overview of the reactive supply and voltage control from generation and other sources service accounting process (see “Reactive Supply and Voltage Control Service Accounting Overview”).
- How credits for reactive supply and voltage control from generation and other sources service are calculated (see “Reactive Supply and Voltage Control Credits”).
- How charges for reactive supply and voltage control from generation and other sources service are calculated for Network and Point-to-Point Transmission Customers (see “Reactive Supply and Voltage Control Charges”).

## 3.1 Reactive Supply and Voltage Control Service Accounting Overview

To maintain transmission voltages within acceptable limits, generation and other resources in PJM are operated to produce or absorb reactive power. Reactive supply and voltage control from generation sources service must be provided for each transaction on the Transmission Provider’s transmission facilities. The amount that must be supplied is determined based on the reactive power support that is necessary to maintain voltages within established limits, as further described in the PJM Manual 03: Transmission Operations.

Reactive Supply and Voltage Control from Generation and Other Sources Service is provided by the Transmission Provider. Transmission Customers must purchase this service from the Transmission Provider.

The credits for this service are billed on a monthly basis. The monthly credit is equal to the one-twelfth (1/12) of the annual revenue requirement for each generating unit or other source providing Reactive Supply and Voltage Control.

The charges for this service are based on a formula rate that allocates generation owners’ reactive revenue requirements to Network and Point-to-Point Transmission Customers based on their monthly transmission use on a megawatt basis. Customers serving zonal Network and Point-to-point load are allocated a ratio share of the total revenue requirements in the applicable zone(s). Customers serving non-zone load and Point-to-Point Transmission Customers not directly serving PJM load are allocated a ratio share of the total revenue requirements for PJM.

## 3.2 Reactive Supply and Voltage Control Credits

A Generation Owner or other resource owner that has a reactive revenue requirement approved (or one accepted and set for settlement and/or hearing before an administrative law judge) by FERC will receives monthly Reactive Supply and Voltage Control from Generation Sources Service credit equal to one-twelfth (1/12) of its annual reactive revenue requirement.

PJM Settlement, Inc. administers the billing aspects of the accepted or approved reactive revenue requirements. PJM encourages Generation Owner or other source owners to consider the following when seeking approval of a reactive revenue requirement from FERC.

- Request a total annual revenue requirement which yields a monthly revenue requirement that is evenly rounded to the penny when divided by 12 in order to avoid the introduction of rounding error. For example, $99,999.96 is preferred as an annual revenue requirement over $100,000. This is because $99,999.96/12 yields a monthly revenue requirement of $8,333.33, whereas $100,000/12 yields a monthly revenue requirement of $8,333.3333, which introduces rounding error.
- Request the 1st day of a calendar month as the effective date, which allows for a cleaner billing process. Non-first of the calendar month effective dates will have the monthly revenue requirement prorated.
- Request that any FERC settlement agreement provides at least 60 days for PJM to process any refunds owed to Members.
- For non-PJM Members, ensure proper documents are executed with both PJM and a PJM Member to ensure billing responsibility is established. Email PJM Member Relations at custsvc@pjm.com for assistance.

A revenue requirement may be allocated or assigned to another PJM Member by following the guidance provided in the Open Access Transmission Tariff (OATT), Schedule 9 and the PJM Manual 14D: Generator Operation Requirements, Section 5.7.2. The current zonal revenue requirements are posted on the PJM website under Markets & Operations > Billing > Settlements & Credit http://www.pjm.com/markets-and-operations/billing-settlements-and-credit.aspx.

## 3.3 Reactive Supply and Voltage Control Charges

Charges for Reactive Supply and Voltage Control Service are calculated for zone load (typically Network Customers) and for non-zone load (typically Point-to-Point Transmission Customers and Network Transmission Customers in a zone with no reactive revenue requirement) separately. The sum of all PJM Transmission Customers' monthly charges equal one-twelfth (1/12) of the total annual reactive revenue requirements that are credited to generation owners.

Each Transmission Customer's charge is calculated by determining the Transmission Customer's monthly zone and non-zone charge.

- Reactive Charge = Reactive Zone Charge + Reactive Non-Zone Charge

### 3.3.1 Reactive Zone Charge

Transmission Customers with monthly zone transmission use are charged a share of the applicable zonal reactive revenue requirements (less the total share of revenue requirements recovered from non-zone transmission use) based on their portion of monthly transmission use in that zone(s). This is billed as the Reactive Zone Charge.

PJM calculates the Reactive Zone Charge by multiplying the zonal total monthly reactive revenue requirement by the Transmission Customer's ratio share of monthly zone transmission use and then applying an Adjustment Factor. The Adjustment Factor accounts for the share of the revenue requirement that is recovered from non-zone transmission use. This calculation is applied to each zone separately.

- Reactive Zone Charge = PJM Zonal Total Monthly Reactive Revenue Requirement * (Transmission Customer's Monthly Zone Transmission Use / PJM Total Zone Transmission Use) * Adjustment Factor
  - PJM Zonal Total Monthly Reactive Revenue Requirement = total PJM annual reactive revenue requirement for each zone / 12
  - Transmission Customer's Monthly Zone Transmission use = sum of daily Network Service Peak Load contributions to a PJM zone + daily average Point-to-Point energy reservations where the point of delivery is within a given PJM zone
  - PJM Total Zone Transmission Use = sum of all Transmission Customers' monthly zone transmission use
  - Adjustment Factor = total monthly zone transmission use for all PJM Zones / PJM Total Monthly Transmission Use
    - Total Monthly Zone Transmission Use for all PJM Zones = sum of all Transmission Customers' monthly zone transmission use in all PJM Zones
    - PJM Total Monthly Transmission Use = sum of all Transmission Customers' monthly zone transmission use + non-zone transmission use

### 3.3.2 Reactive Non-Zone Charge

Transmission Customers with monthly non-zone transmission use are charged a share of the total PJM monthly reactive revenue requirement based on their portion of the total PJM monthly transmission use. This is billed as the Reactive Non-Zone Charge.

PJM calculates the Reactive Non-Zone Charge by multiplying the total monthly reactive revenue requirement by the Transmission Customer's ratio share of non-zone transmission usage.

- Reactive Non-Zone Charge = PJM Total Monthly Reactive Revenue Requirement * (Transmission Customer's Monthly Non-Zone Transmission Use / PJM Total Monthly Transmission Use)
  - PJM Zonal Total Monthly Reactive Revenue Requirement = total PJM annual reactive revenue requirement for each zone / 12
  - Transmission Customer's Monthly Non-Zone Transmission use = sum of daily Network Service Peak Load contributions in zone(s) that have no reactive revenue requirement + (daily average Point-to-Point energy reserve where the point of delivery is within a given PJM zone (adjusted for PJM curtailments) and have no reactive revenue requirement / 24)
  - PJM Total Monthly Transmission Use = sum of all Transmission Customers' monthly zone transmission use + non-zone transmission use

# Section 4: Energy Imbalance Service Accounting

Welcome to the Energy Imbalance Service Accounting section of the **PJM Manual for Open Access Transmission Tariff Accounting**. In this section, you will find the following information:

- A description of the Energy Imbalance ancillary service accounting (see "Energy Imbalance Service Accounting Overview").

## 4.1 Energy Imbalance Service Accounting Overview

Energy Imbalance service is provided when a difference occurs between the scheduled and the actual delivery of energy over a single hour to a load that is located within PJM. PJM must offer this service when Transmission Service is used to serve load located with PJM. Currently PJM has none of these types of transmission customers.

Each Transmission Customer must purchase Energy Imbalance service through PJM. For each Network Customer and Point-to-Point Transmission Customers. Energy Imbalance service is considered PJM Interchange and is therefore accounted for as Spot Market energy using real-time five minute Locational Marginal Prices (LMP), as described in the PJM Manual 28: Operating Agreement Accounting, and not calculated independently.

# Section 5: Network Integration Transmission Service Accounting

Welcome to the *Network* Integration *Transmission Service Accounting* section of the ***PJM Manual for Open Access Transmission Tariff Accounting***. In this section, you will find the following information:

- An overview of Network Integration Transmission Service Accounting (see "*Network Integration Transmission Service Accounting Overview*").
- How charges for Network Integration Transmission Service are calculated for Network Customers (see "*Network Integration Transmission Service Charges*").
- How credits for Network Integration Transmission Service are calculated for TOs (see "*Network Integration Transmission Service Credits*").
- Describe how Direct Assignment Facilities charges and credits are calculated (see "Direct Assignment Facilities Charges and Credits").
- Describe how Other Supporting Facilities charges and credits are calculated (see "Other Supporting Facilities Charges and Credits").
- Provide business rules for Network Load to select nodal pricing (see "Business Rules for Nodal Pricing Settlement for Network Load").
- Provide business rules for Network Load to change its settlement area definition (see "Business Rules for Changing Settlement Area Definitions of Network Load").

## 5.1 Network Integration Transmission Service Accounting Overview

PJM provides accounting services for Network Integration Transmission Service (NITS). Network Integration Transmission Service allows Network Customers to integrate, economically dispatch, and regulate their current and planned Network Resources to serve their Network Load that is located in PJM and any additional load that is properly designated by the Network Customers. Network Customers taking Network Integration Transmission Service must obtain or provide Ancillary Services.

Network Customers pay the Transmission Provider for the following costs:

- Monthly demand charge
- Direct assignment facilities charge
- Other supporting facilities charge
- Ancillary Services

Each Network Customer pays a monthly demand charge that is based on its daily Network Service Peak Load contribution (including losses) located with the Zone and the Network Integration Transmission Service rate for the Zone in which the Network Load is located.

The Network Service demand charges are then allocated to the appropriate Transmission Owner (TO) based on its Annual Transmission Revenue Requirement. The Annual Transmission Revenue Requirement is the total annual cost to support capital and O&M expenses for the Transmission System for the purpose of Network Integration Transmission Service.

The current Network Integration Transmission Service Rate and the Annual Transmission Revenue Requirement for each Zone in PJM is posted on the PJM website under Markets & Operations/Market Settlements at http://www.pjm.com/markets-and-operations/billing-settlements-and-credit.aspx. The PJM Non-Zone network rate is $14,714 MW/year, as stated in the Open Access Transmission Tariff (OATT), Attachment H-A.

## 5.2 Network Integration Transmission Service Charges

A daily demand (network service) charge for Network Integration Transmission Service is calculated by PJM for each Network Customer, including Transmission Owners (TOs), for the Zone(s) in which the Network Load of the Network Customer is located.

### 5.2.1 Network Serve Peak Load (NSPL) and Peak Load Contribution (PLC)

PJM determines the zonal Network Service Peak Load (NSPL) value each year and the values are effective January 1 of each calendar year. The zonal NSPL is obtained from the dates of the preceding 12 months ending October 31 of the preceding effective year for each zone (November 1 – October 31 preceding the effective year).

PJM will publish the zonal NSPLs, effective January 1 of each year, no later than November 15 of the preceding year. If a Transmission Owner wants to make any adjustments to the upcoming zonal NSPL that are effective January 1, the adjustments must be provided to PJM by November 10 of the preceding year. Any adjustments not provided to PJM by November 10 will not be reflected in the following year's zonal NSPL.

For Network Customers taking Network Integration Transmission Service under state required retail access programs, Peak Load Contributions (PLCs) may change daily, and are expressed in tenths of a MW. These daily Peak Load Contributions are submitted to PJM via Capacity Exchange by the associated Electric Distribution Companies (EDCs) 36 hours prior to the day being billed, and may be corrected up to 12:00 PM Eastern Prevailing Time of the next business day following the Operating Day. These daily peak load contributions are then subtracted from the EDC's fixed peak load obligation to obtain the EDC's daily peak load contribution.

- The daily sum of all LSEs' Network Service Peak Load contributions including losses in a zone/area must equal the EDC's Network Service Peak Load allocation in the zone/area.
- A Network Service Peak Load Scaling Factor will be used to scale the uploaded LSE Network Service Peak Load values to the fixed Network Service Peak Load Allocation of the zone/area in the event that the Network Service Peak Load values uploaded by the EDC do not exactly sum to the Annual Network Service Peak Load Allocation for the zone/area.
    - Daily Network Service Peak Load Scaling Factor = Annual Zone Area Network Service Peak Load Allocation / Total Zone Area Network Service Peak Load Uploads

### 5.2.2 Daily Network Integration Transmission Service Charge

Network Customer's daily Network Integration Transmission Service (NITS) charge is based on their daily NSPL for the Zone(s) in which the Network Load is located. Non-zone network service, the customer is based on their load at the hour of the PJM regional peak for the 12 months ending October 31 of the preceding year. Network customers who are TOs do not actually pay themselves for use of their own transmission facilities. Network service charges are shown on TOs' invoices only to identify their cost responsibility, as ordered by FERC, and they are offset by an equal amount of network service credits.

**PJM Actions**

- PJM obtains the Network Customer's daily Peak Load Contribution (including losses) by zone
- PJM obtains the Zonal Network Integration Transmission Service rates ($/MW-year) by zone
- PJM obtains the Non-Zone Network Integration Transmission Service rate ($/MW-year)
- For Network Customers, PJM calculates the daily network service charge for each Zone in which the Network Customer's load is served. PJM sums all the daily network service charges for each month.
  - o Daily Network Service Charge = Daily Peak Load Contribution * (Annual Zonal Network Integration Transmission Service rate / Number of days per year)
-

## 5.3 Network Integration Transmission Service Credits

The monthly Network Integration Transmission Service charges for Network Customers are then allocated as a credit to the appropriate TO for each Zone.

Transmission Owners (TOs) do not actually pay themselves for use of their own transmission facilities Network service credits on TOs' invoices may include their own network service charges which are only shown to identify their cost responsibility.

**PJM Actions**

- Annual Transmission Revenue Requirement for each TO ($)
- Annual Transmission Revenue Requirement for each Zone ($)
- Network Service charge for each Network and Firm Point-to-point load-serving Customer ($)
- PJM calculates the monthly network service credit for each TO in each Zone. For each Zone, the total Network Service zone charges ($) are allocated on a ratio share to each TO in each Zone.
  - o Monthly Network Service Credit = Total Zonal Network Service Charges * (TO's Annual Transmission Revenue Requirement / Zone Transmission Revenue Requirement)

Non-zone network revenues are allocated to PJM Transmission Owners based on transmission revenue requirement ratio shares, with the ComEd, AEP, and Dominion shares further allocated to their respective load-serving network and firm point-to-point customers based on demand charge ratios.

## 5.4 Direct Assignment Facilities Charges

If, based on a System Impact Study, PJM determines that the Transmission System is not capable of providing Firm or Non-Firm Point-to-Point Transmission Service without:

- Degrading or impairing the reliability of service to Native Load Customers, Network Customers, and Transmission Customers taking Firm Point-to-Point Transmission Service or
- Interfering with PJM's ability to meet prior firm contractual commitments to others.

The TO is obligated to expand or upgrade the Transmission System. The Transmission Customer must agree to 100 percent compensate the TO(s) for any necessary transmission facility additions, consistent with FERC policy.

The TO determines the costs and provides them to PJM through their Attachment H in the PJM Tariff or a Service Agreement (NITSA, ISA, etc). PJM charges the appropriate Transmission Customer associated with the specific facility being constructed. These charges may also apply to existing network customers based on specifications in their network service agreements.

## 5.5 Other Supporting Facilities Charges

The Transmission Customer shall also pay charges based on a case-by-case basis for facilities necessary to provide Transmission Service at voltages lower than those shown in Attachment H of the PJM Open Access Transmission Tariff for the applicable Zone(s).

The Transmission Customer provides these billing quantities to PJM through their Attachment H in the PJM Tariff or a Service Agreement (NITSA, ISA, etc). PJM bills the appropriate Transmission Customer and provides the revenues to the appropriate Transmission Owner.

## 5.6 Business Rules for Nodal Pricing Settlement of Network Load

The definition of eligibility for nodal settlement shall be:

- Any LSE taking network transmission service from PJM via the Attachment F series of the PJM Tariff and serving retail load that is connected to a single identifiable bus or set of buses with hourly metering such that the customer's load can be clearly separated from other load on the bus or buses.
- Other than those eligible in the preceding bullet, PJM will address eligibility on a case by case basis based on whether a bus or buses can be identified, whether the load can be separated from other LSE load on the bus or buses, and that hourly metering is in place.

The effective date of moves to nodal price load settlement for ALL eligible loads is:

- The available date for moves to nodal price load settlement for all loads requesting such will be June 1 of each year to coincide with the PJM planning year.
- Requests for nodal price load settlement must be provided by the LSE of record for the given load to PJM and the zonal EDC including the proposed applicable bus distribution no later than January 15th or at least 30 days prior to the start of PJM's annual ARR/FTR allocation process, whichever is later. By January 25th, or 10 days after the

initial notice from LSE whichever is later, the zonal EDC must specify the appropriate node definition in PJM InSchedule for this load. The LSE must confirm the InSchedule(s) by February 1st, or 15 days after the initial notice whichever is later.

Requests from the LSE of record to move their load to nodal price settlement must be submitted in writing to the PJM Market Settlement Operations Department, and they must include the following information:

- Name of nodal priced load; name of the PJM billing account in which this load is to be represented; name of the zonal EDC; the peak load at the time of the PJM annual peak from the previous year; and, the load bus identifier(s) with associated distribution percentages (totaling exactly 100%) in order for PJM to create the aggregate node definition.

All ARRs or FTRs granted in the annual direct allocation process must be configured to a nodal sink point for load that takes or has requested nodal settlement. This does not apply to any purchased FTRs.

Any network load receiving nodal settlement will be permanently settled at that node or nodes unless the physical interconnection infrastructure changes to require mapping the load to a different bus or group of busses. This rule shall be in force unless and until FERC approves any submitted tariff language changes by which a move from nodal to zonal settlement can occur.

Demand response offered into all of PJM's load response programs will be settled at the applicable load settlement aggregate point for the load that is reduced (zone, residual zone, or node bus or buses).

## 5.7 Business Rules for Changing Settlement Area Definitions of Network Load

This section is only applicable to network load served under the Attachment F series of the PJM Tariff.

- A change in the definition of an existing energy settlement area for purposes of setting energy settlement prices is defined as:
  - o Splitting an existing area into two or more areas
  - o Combining two or more existing areas into a single area
  - o Creating aggregates of groups of buses within an existing area
  - o Any other activity that changes the defined area for which energy prices are aggregated for settlement purposes.

**Exceptions**

- A. Implementing nodal settlement for an individual customer served under the Attachment F series of the PJM Tariff.
- B. Changes due to addition, replacement or retirement of transmission system components or metering facilities.

**Note:**
Rules in the PJM Tariff require that each settlement area must be a subset of a single transmission zone.

- PJM's policy is that once a more specific settlement area is defined for load settlement, that settlement area must remain in use unless subject to exception "B" as stated above. When implementing exception "B," PJM will require the most specific bus definition available after any physical change to be used in place of the previously used definition.

**Notifications**

- At any time following the receipt of a request regarding a potential change to settlement area definitions, PJM may enter into informal discussions with member companies. PJM will make a confidential notification of any such discussions to the ex officio members representing regulatory authorities (as defined in Section 8.2.2 of the PJM Operating Agreement) and State offices of the Consumer Advocate (as defined in Section 8.2.3 of the PJM Operating Agreement) of the PJM Members Committee.
- Formal notification by a PJM Member of intent to change energy settlement area compositions will be given to PJM no later than October 1 of the year before the new area composition is to become effective. PJM shall promptly notify all other Members of planned changes in energy settlement area definitions through notices to members of the Members Committee, Electricity Markets Committee and Market Implementation Committee and to the ex officio members representing regulatory authorities (as defined in Section 8.2.2 of the PJM Operating Agreement) and State offices of the Consumer Advocate (as defined in Section 8.2.3 of the PJM Operating Agreement) of these three standing Committees.
- No later than December 1, the affected EDC and Network Customer will fully identify the composition of the new area. PJM will promptly transmit this information to members of the Members Committee, Markets and Reliability Committee and Market Implementation Committee and to the ex officio members representing regulatory authorities (as defined in Section 8.2.2 of the PJM Operating Agreement) and State offices of the Consumer Advocate (as defined in Section 8.2.3 of the PJM Operating Agreement) of these three standing Committees.
- The LSE nodal peak load at the time of the PJM annual peak from the previous year must be submitted by January 15$^{th}$ or at least 30 days prior to the start of PJM’s annual FTR/ARR allocation process, whichever is later.

**Technical requirements**

- All changes in the definition of PJM energy settlement areas will become effective on the first day of a planning period --- June 1 of each year.
- Changes to metering, data transmission, settlement or other systems may be required to be made by PJM, the EDC(s) in the affected transmission zone, other Network Customers and the PJM member(s) requesting the change in settlement area definitions. Each involved party must commit to making needed additions, changes or upgrades in

time to meet the June 1 implementation date for the new settlement area definitions. Accordingly, each party must either certify that it can make all necessary infrastructure changes in time to meet the June 1 implementation date for the new settlement area definitions, or must identify activities that cannot be implemented in time. Such declaration must be made to PJM for distribution to all parties by December 1 of the year before the expected June 1 implementation date. Certifications shall not be unreasonably withheld.

- Implementation will be delayed one year to the following June 1 if all notifications and technical certifications have not been received according to the above business rules.

# Section 6: Point-to-Point Transmission Service Accounting

Welcome to the Point-to-Point Transmission Service Accounting section of the **PJM Manual for Open Access Transmission Tariff Accounting**. In this section, you will find the following information:

- An overview of Point-to-Point Transmission service accounting (see "Point-to-Point Transmission Service Accounting Overview").
- How service charges are calculated for Firm and Non-Firm Transmission Customers (see "Point-to-Point Transmission Service Charges").
- How service credits are calculated for Firm and Non-Firm Transmission Customers (see "Point-to-Point Transmission Service Credits").

## 6.1 Point-to-Point Transmission Service Accounting Overview

Transmission Providers provide Firm and Non-Firm Point-to-Point Transmission Service according to the terms in the PJM Open Access Transmission Tariff. Point-to-Point Transmission Service is necessary for transmission of capacity and energy from designated Point(s) of Receipt to designated Point(s) of Delivery.

The PJM accounting process calculates each Transmission Customer's Firm and Non-Firm Point-to-Point Transmission service charge. Weekly adjustments to Point-to-Point service charges are made so that the total daily demand charge in any week does not exceed the weekly rate. The collected Point-to-Point transmission charges are then allocated as credits.

### 6.1.1 Firm Point-to-Point Transmission Service

- Each Firm Point-to-Point Transmission Customer is billed each month for its Reserved Capacity.
- Firm Point-to-Point Transmission Service requested with a Point of Delivery (POD) at a MISO interface is not charged.

The demand charge border rates for Firm Point to Point Transmission Service are defined in accordance with the PJM Open Access Transmission Tariff, Schedule 7.

The current demand charge border rates are also posted on the PJM website at https://www.pjm.com/markets-and-operations/billing-settlements-and-credit.aspx.

The total daily demand charge in any week shall not exceed the rate for weekly service times the highest amount of Reserved Capacity in any day during the week. A week is defined as Monday through Sunday.

### 6.1.2 Non-Firm Point-to-Point Transmission Service

Each Non-Firm Point-to-Point Transmission Customer is billed each month for its Reserved Capacity. Non-firm Point-to-Point Transmission Service requested with a Point of Delivery at a MISO interface is not charged. The current demand charge border rate is discounted to $0.67/MWh for all Reserved Capacity for Non-Firm Point-to-Point Transmission Service with a point of delivery equal to the PJM Border.

## 6.2 Point-to-Point Transmission Service Charges

The PJM accounting process calculates each Point-to-Point Transmission Customer's Transmission Service demand charge.

### 6.2.1 Firm Point-to-Point Transmission Service Charges

Firm Point-to-Point demand charges are calculated for each Point-to-Point Transmission Customer taking firm service.

**PJM Actions**

- The PJM accounting process prepares a list of the Transmission Customers.
- The PJM accounting process retrieves the following information:
  - List of Transmission Customer's Firm Point-to-Point Transmission Service contracts
  - Charge rates for Firm Point-to-Point transactions
- The PJM accounting process calculates the transmission service charge ($) for each transaction as follows:

$$Transmission\ Service\ Charge = Applicable\ Firm\ Point - to - Point\ Transaction\ Charge\ Rate\ *Service\ Contract\ MW$$

- The PJM accounting process calculates each Transmission Customer's Firm Point-to-Point Transmission service charge for the month by summing the individual Transmission Service charges for each hour.

### 6.2.2 Adjustment to Firm Daily Point-to-Point Transmission Service Charges

A Point-to-Point Transmission Customer's daily Firm Point-to-Point demand charge needs to be adjusted if the total demand charge in the week exceeds the weekly rate times the highest amount of Reserve Capacity in any day during that week. A week is defined as Monday through Sunday.

**PJM Actions**

- The PJM accounting process prepares a list of Transmission Customers.
- The PJM accounting process retrieves the following data:
  - Weekly charge rate for Firm Point-to-Point transactions ($/MW-wk)
  - Each Firm Transmission Customer's maximum daily reserved transmission capacity (MWh)
  - Each Transmission Customer's total demand charges ($) for Daily Firm Point-to-Point reservations during the week.
- The PJM accounting process calculates each Point-to-Point Transmission Customer's total daily demand charges by summing all daily Firm Point-to-Point transmission service charges during the week.
- The PJM accounting process sets the comparable weekly transmission capacity for each Transmission Customer to the maximum value of the customer's Firm daily reservations for any day during the week.

- The PJM accounting process calculates the comparable weekly demand charge for each Point-to-Point Transmission Customer ($) as follows:

$$Comparable\ Weekly\ Demand\ Charge = Weekly\ Demand\ Charge * Comparable\ Weekly\ Transmission\ Capacity$$

- If the Comparable Weekly Demand charge is less than the sum of the actual Daily demand charges for the week then:

$$Weekly\ Adjustment\ to\ Daily\ Charges =$$
$$Weekly\ Sum\ of\ Actual\ Daily\ Demand\ Charges - Comparable\ Weekly\ Demand\ Charge$$

- The Transmission Customer's total Firm Daily Demand charge for the month is reduced by the amount of the weekly adjustment to Daily charges, for any week that ended during that billing month.

### 6.2.3 Non-Firm Transmission Service Charges

Non-Firm Point-to-Point service charges are calculated for each Non-Firm Point-to-Point Transmission Customer taking non-firm service. The charges are based on the discounted hourly demand charge for non-firm point-to-point transactions.

**PJM Actions**

- The PJM accounting process prepares a list of Point-to-Point Transmission Customers.
- The PJM accounting process retrieves the following information:
  - List of Transmission Customer's Non-Firm Point-to-Point Transmission Service contracts
  - Hourly demand charge rate for Non-Firm Point-to-Point transactions ($/MWh)
  - Hourly amount of each reservation curtailed by PJM (MW)
  - Hourly congestion charges associated with each reservation
- The PJM accounting process calculates the non-firm demand charge for each hour for each reservation ($) as follows:

$$Hourly\ Non-Firm\ Transmission\ Service\ Charge =$$
$$[Hourly\ Demand\ Charge\ Rate * (MWs\ Reserved - MWs\ Curtailed)] -$$
$$Hourly\ Congestion\ Charge\ (if\ congestion\ charge\ is > 0)$$

- If the result of this calculation is a negative value, Hourly Non-Firm Transmission Service Charge = $0.00.
- The PJM accounting process calculates each Transmission Customer's Non-Firm Point-to-Point Transmission service charges by summing the individual hourly transmission service charges.

### 6.2.4 Monthly Adjustment to Firm Point to Point Transmission Service Charges

A Transmission Customer taking Firm Point-to-Point Transmission Service at the PJM border with a Point of Delivery at a Merchant Transmission Facility holding Firm Transmission

Withdrawal Rights during a month will receive a discount to the monthly demand charge through a reduction to the applicable charge rate.

**PJM Actions**

- The PJM accounting process prepares a list of applicable Transmission Customers.
- The PJM accounting process retrieves the following data:
    - o Charge rates for firm point-to-point transactions
    - o The monthly transmission enhancement charges specific to the Merchant Transmission Facility where the Transmission Customer is taking Firm Point-to-Point Transmission Service
    - o The annual sum of the Revenue Requirements for Transmission Customers as defined in the PJM Open Access Transmission Tariff, Schedule 7 Section 11 (A)

A monthly rate adjustment for each applicable Transmission Customer is calculated as follows:

$$Monthly\ Rate\ Adjustment = \frac{Border\ Yearly\ Charge\ Rate * Monthly\ Transmission\ Enhancement\ Charges}{Annual\ Sum\ of\ Revenue\ Requirements}$$

PJM converts the monthly rate adjustment to a daily discount rate that is then subtracted from the applicable firm point-to-point transaction charge rate and applied to the calculation of the Firm Point-to-Point Transmission Service charge as described in section 6.2.1.

## 6.3 Point-to-Point Transmission Service Credits

The monthly demand charges for Point-to-Point Transmission Customers are then allocated as credits. This allocation appears as a credit on the PJM Open Access Transmission Tariff portion of the bill.

### 6.3.1 Firm Transmission Service Credits

The monthly sum charges for Firm Point-to-Point Transmission Customers are allocated to PJM transmission owners based on transmission revenue requirement ratio shares, with the ComEd, AEP, and Dominion shares further allocated to their network and firm point-to-point load-serving customers based on demand charge ratios.

**PJM Actions**

- The PJM accounting process prepares a list of the Transmission Owners and a list of network customers in the ComEd, AEP, and Dominion zones.
- The PJM accounting process retrieves the following information:
    - o Each TOs Revenue Requirement based on Attachment H ($)
    - o Each ComEd network customer’s network service charges ($)
    - o Each Dominion network customer’s network service charges ($)
    - o Each AEP network customer’s network service charges and firm point-to-point charges for serving load in the AEP zone ($)
    - o Each Transmission Customer’s Firm Point-to-Point transmission service charge ($)

  

- The PJM accounting process calculates the total PJM Transmission Revenue Requirement by summing the TO Transmission Revenue Requirements.
- The PJM accounting process calculates the total Firm Point-to-Point Transmission service charge by summing the Firm Point-to-Point transmission service customers' charges ($).
- The PJM accounting process calculates the allocation of Firm Point-to-Point Transmission Service charges ($) to PJM TOs based on transmission revenue requirement percentage shares.
- The PJM accounting process further allocates the respective Dominion and ComEd zone revenue share to all network customers in the Dominion and ComEd zones based on their network service peak load contributions for the month, and further allocates the AEP zone revenue share to all network and firm point-to-point customers in the AEP zone based on their network service peak load and firm point-to-point peak usage contributions for the month.

### 6.3.2 Non-Firm Transmission Service Credits

Transmission revenues from Non-Firm Point-to-Point Transmission Service (other than revenues for congestion charges) are allocated to PJM Network Customers and PJM Firm Point-to-point Customers based on monthly demand charge ratios in accordance with Section 27A of the PJM Open Access Transmission Tariff.

Transmission revenues from Non-Firm Point-to-Point Transmission Service (other than revenues for congestion charges) are allocated in accordance with Section 27A of the PJM Open Access Transmission Tariff.

**PJM Actions**

- The PJM accounting process prepares a list of the Transmission Owners.
- The PJM accounting process retrieves the following information:
  - Each Transmission Customer's Non-firm Point-to-Point transmission service charge ($)
  - Each Transmission Customer's Firm Point-to-Point transmission service charge ($)
  - Each PJM network customer's demand charge ($)
- The PJM accounting process calculates the total PJM Transmission Revenue Requirement by summing the TO Transmission Revenue Requirements.
- The PJM accounting process calculates the total Non-Firm Point-to-Point Transmission service charge by summing the Non-Firm Point-to-Point transmission service customers' charges ($).
- The PJM accounting process calculates the allocation of Non-Firm Point-to-Point Transmission Service charges ($) to all Firm Point-to-Point and Network transmission customers based on percentage shares of their Firm and Network demand charges.

# Section 7: Black Start Service Accounting

Welcome to the *Black Start Service Accounting* section of the ***PJM Manual for Open Access Transmission Tariff Accounting***. In this section, you will find the following information:

- An overview of the black start service accounting process (see “Black Start Service Accounting Overview”).
- How credits for black start service are calculated (see “Black Start Service Credits”).
- How charges for black start service are calculated for Network and Point-to-Point Transmission Customers (see “Black Start Service Charges”).

## 7.1 Black Start Service Accounting Overview

To ensure the reliable restoration following a shutdown of the PJM Transmission System, Black Start Service is necessary to facilitate the goal of complete system restoration. Black Start Service is the capability of generating units to start without an outside electrical supply or the demonstrated ability of a generating unit with a high operating factor to automatically remain operating at reduced levels when disconnected from the grid. Black Start Service enables the Transmission Provider in collaboration with Transmission Owners to designate specific generators (Black Start Units) whose location and capabilities are required to re-energize the transmission system following a system-wide blackout, as further described in the PJM Manual 12: Balancing Operations, Section 4.

Black Start Service is provided by the Transmission Provider, and all Transmission Customers must purchase this service from the Transmission Provider, pursuant to the PJM Open Access Transmission Tariff Schedule 6A.

The credits for this service are billed on monthly basis. The monthly credit is equal to one-twelfth (1/12) of the annual revenue requirement for ach Black Start Unit.

The charges for this service are based on a formula rate that allocates generation owners’ black start revenue requirements and applicable Day-ahead and Balancing Operating Reserve Credits to Network and Point-to-Point Transmission Customers based on their monthly transmission use on a megawatt basis. Customers serving zonal Network and Point-to-point load are allocated a ratio share of the total revenue requirements and applicable Day-ahead and Balancing Operating Reserve Credits in the applicable zone(s). Customers serving non-zone load (including Point-to-Point Transmission Customers not serving PJM load) are allocated a ratio share of the total revenue requirements and applicable Day-ahead and Balancing Operating Reserve Credits for PJM.

## 7.2 Black Start Service Credits

Black Start Units must meet specific PJM and NERC criteria to be deemed a Black Start Unit. These units also must follow testing protocols to verify the Black Start Capability. Both the criteria and testing are further described in the PJM Manual 12: Balancing Operations, Section 4. Annual revenue requirements are determined as described in Open Access Transmission Tariff, Schedule 6A and PJM Manual 15: Cost Development Guidelines, section 13. Revenue requirements for joint-owned black start units are allocated to the owners based on their ownership shares.

Existing Black Start Unit owner's monthly credits will be one-twelfth (1/12) of their annual revenue requirement.

New Black Start Unit owner's monthly credits will be held by PJM in a non-interest bearing account until PJM's acceptance of the owner's annual revenue requirement pursuant to section 17 of the Open Access Transmission Tariff Schedule 6A. After PJM's acceptance, new Black Start Unit owners will begin to receive monthly credits, including any monthly credits held by PJM, back to its in-service date and any required estimated annual revenue requirement true up in the monthly bill.

Monthly Black Start Service revenues are forfeited when:

- Black Start Units that fail a black start test and do not successfully pass a test within a ten (10) day grace period immediately following a failed test; or
- Black Start Units without a successful black start test on record with PJM within the last thirteen (13) months.

Zonal revenue requirements equal the total revenue requirements of all Black Start Units nominated as critical by the Transmission Provider in that zone regardless of zonal location and the share of annual revenue requirements of Black Start Units designated as critical across multiple zones (cross-zonal coordination).

The current zonal revenue requirements are posted on the PJM website under Markets & Operations/Billing, Settlements & Credit.

## 7.3 Black Start Service Charges

Charges for Black Start Service are calculated for zone load (Network Customers and customers serving load with Point-to-Point Transmission Service) and for non-zone load (Non-Zone Network Customers and Point-to-Point Transmission Customers) separately. The sum of all customers' monthly charges equal one-twelfth (1/12) of the total annual black start revenue requirements that are credited to Generation Owners of Black Start Units plus the applicable Day-ahead and Balancing Operating Reserve Credits that are credited to Generation Owners of Black Start Units for the month.

Each Transmission Customer's charge is calculated by determining the Transmission Customer's monthly zone and non-zone charge.

- Black Start Charge = Black Start Zone Charge + Black Start Non-Zone Charge

### 7.3.1 Black Start Zone Charge

Transmission Customers with monthly zone transmission use are charged a share of the applicable zonal black start revenue requirements (less the total share of revenue requirements recovered from non-zone transmission use) based on their portion of monthly transmission use in that zone(s). This is billed as the Black Start Zone Charge.

PJM calculates the Black Start Zone Charge by multiplying the sum of the zonal total monthly black start requirement plus the Day-ahead Operating Reserve Credits associated with Black Start plus the Balancing Operating Reserve Credits associated with Black Start by the Transmission Customer's ratio share of monthly zone transmission use and then applying an Adjustment Factor. The Adjustment Factor accounts for the share of the revenue requirement that is recovered from non-zone transmission use. This calculation is applied to each zone separately.

- Black Start Zone Charge = (PJM Zonal Monthly Black Start Revenue Requirement + PJM Black Start DA Operating Reserve Credit + PJM Black Start BAL Operating Reserve Credit) * (Transmission Customer's Monthly Zone Transmission Use / PJM Total Transmission Use) * Adjustment Factor
  - o PJM Zonal Total Monthly Black Start Revenue Requirement = (existing Black Start Unit monthly revenue requirement + new Black Start Unit monthly estimated revenue requirement) / 12
    - − New Black Start Unit Monthly Estimated Revenue Requirement = Black Start Unit owner's revenue requirement estimate at the time the unit enters Black Start Service until PJM's acceptance.
  - o PJM Black Start DA Operating Reserve Credit = Day-Ahead Operating Reserve credits associated with scheduling and/or testing Black Start Units
  - o PJM Black Start BAL Operating Reserve Credit = Balancing Operating Reserve credits associated with scheduling and/or testing of Black Start Units
  - o Transmission Customer's Monthly Zone Transmission use = sum of daily Network Service Peak Load contributions to a PJM zone + daily average Point-to-Point energy reservations where the point of delivery is within a given PJM zone
  - o PJM Total Zone Transmission Use = sum of all Transmission Customers' monthly zone transmission use
  - o Adjustment Factor = total monthly zone transmission use for all PJM Zones / PJM Total Monthly Transmission Use
    - − Total Monthly Zone Transmission Use for all PJM Zones = sum of all Transmission Customers' monthly zone transmission use in all PJM Zones
    - − PJM Total Monthly Transmission Use = sum of all Transmission Customers' monthly zone transmission use + non-zone transmission use

### 7.3.2 Black Start Non-Zone Charge

Transmission Customers with monthly non-zone transmission use are charged a share of the total PJM monthly black start revenue requirement based on their portion of the total PJM monthly transmission use. This is billed as the Black Start Non-Zone Charge.

PJM calculates the Black Start Non-Zone Charge by multiplying the total monthly black start revenue requirement by the Transmission Customer's ratio share of non-zone transmission usage.

- Black Start Non-Zone Charge = (PJM Zonal Monthly Black Start Revenue Requirement + PJM Black Start DA Operating Reserve Credit + PJM Black Start BAL Operating Reserve Credit) * (Transmission Customer's Monthly Non-Zone Transmission Use / PJM Total Transmission Use)
  - o PJM Zonal Total Monthly Black Start Revenue Requirement = (existing Black Start Unit monthly revenue requirement + new Black Start Unit monthly estimated revenue requirement) / 12

    - New Black Start Unit Monthly Estimated Revenue Requirement = Black Start Unit owner’s revenue requirement estimate at the time the unit enters Black Start Service until PJM’s acceptance.

- PJM Black Start DA Operating Reserve Credit = Day-Ahead Operating Reserve credits associated with scheduling and/or testing Black Start Units
- PJM Black Start BAL Operating Reserve Credit = Balancing Operating Reserve credits associated with scheduling and/or testing of Black Start Units
- Transmission Customer’s Monthly Non-Zone Transmission use = sum of daily Network Service Peak Load contributions in zone(s) that have no black start revenue requirement + (daily average Point-to-Point energy reserve where the point of delivery is within a given PJM zone (adjusted for PJM curtailments) / 24)
- PJM Total Monthly Transmission Use = sum of all Transmission Customers’ monthly zone transmission use + non-zone transmission use

# Section 8: Open Loop Hybrid & Energy Storage Resource Charging Energy

Welcome to the Open-Loop Hybrid & Energy Storage Resource Charging Energy section of the PJM Manual for Manual for Open Access Transmission Tariff Accounting. In this section, you will find the following information:

- A description of the accounting procedures for Open-Loop Hybrid Resource & Energy Storage Resource Charging Energy.

## 8.1 Overview of Charging Energy

An Energy Storage Resource or Open-Loop Hybrid Resoure is a resource capable of receiving electric energy from the grid and storing it for later injection to the grid that participates in the PJM Energy, Capacity and/or Ancillary Services markets as a Market Participant. Examples of Energy Storage Resource technologies include but are not limited to pumped storage hydroelectric plants, batteries, and flywheels. A hybrid resource is composed of one generation component and one storage component behind the same Point of Interconnection operating as a single integrated resource; an Open-Loop Hybrid is a hybrid resource that is physically and contractually capable of charging its storage component from the grid.

Charging energy that is purchased for storing in an Energy Storage Resource or Open-Loop Hybrid Resource for later resale is always billed at the applicable Locational Marginal Price. However, different categories of charging energy accrue different sets of charges according to use. These categories are summarized as follows (formal definitions are in the PJM Tariff):

- “Direct Charging Energy” shall mean the energy that an Energy Storage Resource or Open-Loop Hybrid Resource purchases from the PJM Interchange Energy Market and (i) later resells to the PJM Interchange Energy Market; or (ii) is lost to conversion inefficiencies, provided that such inefficiencies are an unavoidable component of the conversion, storage, and discharge process that is used to resell energy back to the PJM Interchange Energy Market. Note that Direct Charging Energy is purchased by Energy Storage Resource Model Participants or Open-Loop Hybrid Resources and is divided into two subcategories:
    - o “Dispatched Charging Energy” shall mean Direct Charging Energy that an Energy Storage Resource Model Participant or Open-Loop Hybrid Resource receives from the electric grid pursuant to PJM dispatch while providing a service in the PJM markets.
    - o “Non-Dispatched Charging Energy” shall mean all Direct Charging Energy that an Energy Storage Resource Model Participant or Open-Loop Hybrid Resource receives from the electric grid that is not otherwise Dispatched Charging Energy. An example of Non-Dispatched Charging Energy is charging energy at an ESR that is self-scheduled and not dispatchable.
- “Load Serving Charging Energy” shall mean energy that is purchased from the PJM Interchange Energy Market and stored in an Energy Storage Resource or Open-Loop

Hybrid Resources for later resale to end-use load. Note that only Load Serving Entities may purchase Load Serving Charging Energy. Load Serving Charging Energy is comparable to ordinary load.

Non-Dispatched Charging Energy must pay applicable transmission charges as a Network Service User. By contrast, Dispatched Charging Energy does not pay such charges. Charging energy qualifies as Dispatched Charging Energy when the Energy Storage Resource or Open-Loop Hybrid Resource follows PJM dispatch within 10% of the desired output and meets one of the following conditions:

- Provides Energy Imbalance Service under Schedule 4 of the PJM Tariff. Energy Storage Resource Model Participants or Open-Loop Hybrid Resource shall be considered to be providing Energy Imbalance Service when they are dispatchable by PJM in real time. An Energy Storage Resource or Open-Loop Hybrid Resource shall be considered dispatchable when the fixed generation flag is set to “no” and the dispatchable range exceeds 10% of the absolute value of the relevant economic limit.
- Assigned to Regulation, Synchronized Reserves, or Reactive Service;
- Being manually dispatched for reliability

## 8.2 Charges for Direct Charging Energy

As described above, Direct Charging Energy purchases by Energy Storage Resource Model Participants or Open-Loop Hybrid Resources fall into two categories: Dispatched Charging Energy and Non-Dispatched Charging Energy. Dispatched Charging Energy does not pay transmission charges; however Non-Dispatched Charging Energy does pay transmission charges, and must arrange for Network Transmission Service. Non-Dispatched Charging Energy uses the transmission system, and an Energy Storage Resource Model Participant or Open-Loop Hybrid Resource purchasing Non-Dispatched Charging Energy is a Network Service User. As a result, certain Transmission Customer charges apply to Non-Dispatched Charging Energy that do not apply to generation output. However, the PJM Tariff states that Direct Charging Energy (which includes Non-Dispatched Charging Energy) is exempt from other Transmission Customer charges. Further, because Direct Charging Energy (including Non-Dispatched Charging Energy) is not end-use load, charges that are applicable to Load Serving Entities and to end-use load are not applicable to Direct Charging Energy. Therefore, Non-Dispatched Charging Energy is eligible for allocation of the following non-LMP charges and credits:

- Schedule 1A Transmission Owner Scheduling, System Control and Dispatch Service
- Schedule 9-3, 9-FERC, 9-OPSI, 9-CAPS, 9-MMU, and 9-PJM Settlement
- Schedule 10-NERC and 10-RFC
- Network Integration Transmission Service
- Network Transmission Service Offset
- MTEP Project Cost Recovery
- Transmission Enhancement

- Other Supporting Facilities
- Non-Firm Point-to-Point Transmission Service
- Black Start Service
- Unscheduled Transmission Service
- Reactive Supply and Voltage Control from Generation and Other Sources Service

An Energy Storage Resource or Open-Loop Hybrid Resource shall be considered charging when the Revenue Data for Settlements for a Real Time Settlement Interval corresponds to a withdrawal. The determination of Non-Dispatched Charging Energy vs. Dispatched Charging Energy shall be made for each Real Time Settlement Interval. Hourly Non-Dispatched Charging Energy is the sum of Revenue Data for Settlements for the Real Time Settlement Intervals which are determined to be Non-Dispatched Charging Energy over the hour divided by 12.

The PJM Tariff exempts Direct Charging Energy (which includes Non-Dispatched Charging Energy) from the following Transmission Customer charges:

- Schedule 9-1 Control Area Administration
- Allocations of Operating Reserve costs to scheduled day-ahead load and to real-time load pursuant to Tariff Attachment K Appendix Section 3.2.3 – Operating Reserves;
- Allocations of Reactive Service costs pursuant to Tariff Attachment K Appendix Section 3.2.3B – Reactive Services;
- Allocations of Synchronous Condensing costs pursuant to Tariff Attachment K Appendix Section 3.2.3C – Synchronous Condensing for Post-Contingency Operation;
- 500 kV Meter Errors
- Meter Correction Between Control Areas
- Inadvertent Interchange
- Allocation of Balancing Congestion Charges
- Distribution of Total Transmission Loss Charges
- Allocation of Auction Revenue Rights

The following non-LMP charges that apply to Load Serving Entities are not applicable to Direct Charging Energy (which includes Non-Dispatched Charging Energy):

- Synchronized, Non-Synchronized, and Secondary8.3 Reserves
- Regulation
- Capacity Market charges
- Economic Demand Response charges in Day-ahead and Real-Time; and
- Emergency Demand Response charges

FERC directed that Dispatched Charging Energy shall be exempt from paying transmission charges, and therefore charges that are applicable to Transmission Customer use of the transmission system are not applicable to Dispatched Charging Energy. Dispatched Charging Energy therefore pays the same non-LMP charges as generation output, namely:

- Schedule 9-3, 9-MMU, 9-PJM Settlements

## 8.3 Charges for Load Serving Charging Energy

Load Serving Charging Energy is PJM load that is purchased from PJM by a Load Serving Entity and stored in an Energy Storage Resource or Open-Loop Hybrid Resource for later end-use consumption. Load Serving Charging Energy is purchased at the aggregate nodal LMP that is applicable to the corresponding Load Serving Entity load. Load Serving Charging Energy is eligible for the same charges as ordinary load, including all Load Serving Entity charges, end-use load charges, and Transmission Customer charges.

## 8.4 Calculating Charges for Non-Dispatched Charging Energy

PJM will report to Electric Distribution Companies all hourly Energy Storage Resource Model Participant or Open-Loop Hybrid Resource purchases of Non-Dispatched Charging Energy in order to facilitate calculation of Network Service Peak Loads corresponding to those purchases. Non-Dispatched Charging Energy is not end-use load, and therefore the Electric Distribution Company shall not allocate any Peak Load Contribution value to any purchases of Non-Dispatched Charging Energy.

# Section 9: Billing

Welcome to the *Billing* section of the ***PJM Manual for Open Access Transmission Tariff Accounting***. In this section, you will find the following information:

- A summary of the billing process for the PJM Open Access Transmission Tariff (see "Billing Process Overview").

## 9.1 Billing Process Overview

A single billing statement is issued monthly by the PJM to each PJM customer account. The bill details all charges and credits under the PJM Operating Agreement and the PJM Open Access Transmission Tariff for the month, as they apply to that customer account. The billing statement presents a net amount due from or due to the customer. Weekly billing statements are also issued for certain line items. The **PJM Manual for Billing (M-29)** describes the billing process in detail.

The PJM Open Access Transmission Tariff related billing statement line items that are described in this manual are as follows:

- PJM Scheduling, System Control and Dispatch Service (charges, and load reconciliation charges)
- TO Scheduling, System Control and Dispatch Service (charges/credits, and load reconciliation charges)
- Reactive Supply and Voltage Control from Generation and Other Sources Service (charges/credits)
- Energy Imbalance Service (charges/credits)
- Network Integration Transmission Service (charges/credits)
- Network Integration Transmission Service Offset (charges/credits)
- Direct Assignment Facilities (charges/credits)
- Other Supporting Facilities (charges/credits)
- Firm Point-to-Point Transmission Service (charges/credits)
- Non-Firm Point-to-Point Transmission Service (charges/credits)
- Black Start Service (charges/credits)
- Generation Deactivation (charges/credits)
- PJM Settlement, Inc. (charges)
- MMU (charges, and load reconciliation charges)
- FERC (charges, and load reconciliation charges)
- OPSI (charges, and load reconciliation charges)
- CAPS (charges, and load reconciliation charges)
- NERC (charges, and load reconciliation charges)

- RFC (charges, and load reconciliation charges)
- RPM Auction (charges/credits)
- Locational Reliability (charges)
- Interruptible Load for Reliability (charges)
- Capacity Transfer Rights (credits)
- Incremental Capacity Transfer Rights (credits)
- Non-Unit Specific Capacity Transaction (charges/credits)
- Generation Resource Rating Test Failure (charges/credits)
- Capacity Resource Deficiency (charges/credits)
- Demand Resource and ILR Compliance Penalty (charges/credits)
- Qualifying Transmission Upgrade Compliance Penalty (charges/credits)
- Load Management Test Failure (charges/credits)

# Section 10: Transmission Enhancement Accounting

Welcome to the Transmission Enhancement Accounting section of the PJM Manual for Open Access Transmission Tariff Accounting. In this section, you will find the following information:

- An overview of Transmission Enhancement Accounting (see "Transmission Enhancement Accounting Overview").
- Describe how Transmission Enhancement credits are calculated (see "Transmission Enhancement Credits").
- Describe how Transmission Enhancement charges are calculated (see "Transmission Enhancement Charges").

## 10.1 Transmission Enhancement Accounting Overview

PJM provides accounting services for Required Transmission Enhancements. Required Transmission Enhancements, often referred to as "Transmission Enhancements" or "Schedule 12", are transmission projects approved through a Regional Transmission Expansion Plan (RTEP) or jointly coordinated with another region as further described in the Tariff. The designated Transmission Owner(s) construct the project and may seek to recover such costs of the project. If the project is approved through RTEP, then the Transmission Owner may recover the project costs either through the Transmission Owner's Network Integration Transmission Service rate or through a separate transmission enhancement project revenue requirement.

The charges associated with Required Transmission Enhancements are referred to as Transmission Enhancement Charges (TEC). The cost allocation for each project is further described in the PJM Manual 14B: PJM Region Transmission Planning Process, Attachment A.

## 10.2 Transmission Enhancement Credits

Transmission Enhancements credits are how the Transmission Owners may recover their costs associated with Required Transmission Enhancement projects either through their Network Integration Transmission Service rate or through a separate transmission enhancement project revenue requirement.

### 10.2.1 Transmission Enhancement Credits through Network Integration Transmission Service Rates

If the Transmission Owner recovers their costs through its Network Integration Transmission Service (NITS) rate, then the Transmission Owner will not receive a Transmission Enhancement Credit on its monthly billing statement. Rather, these costs will be included in the Transmission Owner's Network Integration Transmission Service credit billing line item. In addition, Network Customers in the Transmission Owner's Zone will receive a Transmission Enhancement Credit on their monthly billing statement for the total costs allocated for the Required Transmission Enhancement projects. This Transmission Enhancement credit is allocated to the Network Customers in the applicable zone based on each customer's respective Network Service Peak Load ratio share.

#### 10.2.2 Transmission Enhancement Credits through Project Revenue Requirements

If the Transmission Owner does not recover their costs through its NITS rate, they may recover their costs through transmission enhancement project revenue requirements. The Transmission Owner will receive a Transmission Enhancement Credit on its monthly billing statement for the total costs of the Required Transmission Enhancement Projects

## 10.3 Transmission Enhancement Charges

Transmission Enhancement charges are associated with the Required Transmission Enhancement projects cost allocation by responsible zone or Merchant Transmission Owner as described in Schedule 12 of the PJM Tariff. All Network Customers serving load in a responsible zone pay for that zone’s applicable share of all Required Transmission Enhancement projects’ revenue requirements in proportion to their Network Service Peak Load share in that Zone. Merchant Transmission Owners also pay their share of the applicable Required Transmission Enhancement projects’ revenue requirements.

# Revision History

**Revision 97 (02/01/2023):**

- Section 2.2.1.5: conforming changes associated with FERC Order ER22-26 settlement approval. Updates describe Schedule 9-PJM Settlement calculation methodology effective February 1, 2023.
- Section 2.5: conforming changes associated with FERC Order ER22-26 settlement approval. Updates to recognize the two sub-parts of component two for 9-PJMSettlement and where reconciliation is applied effective February 1, 2023.

**Administrative Change (Approved by Susan Kenney 02/2/2023):**

- Added "Cover to Cover Periodic Review" language to Revision 96

**Revision 96 (12/21/2022):**

- Cover to Cover Periodic Review
- Updated/correct terminology
- Section 2: re-organized and added more detailed calculations in section 2.3 and 2.4
- Section 3: added considerations for filing to assist in smoother billing process in section 3.2; added sub-section 3.3.1 and 3.3.2 to distinguish Zone and Non-Zone charge calculations
- Section 5: added sub-section 5.2.1 and 5.2.2 to distinguish between the calculation of the annual Network Service Peak Load (NSPL) and Network Integration Transmission Service (NITS) charge; re-organized section 5.3, clarification added in section 5.4, 5.5, 5.6 and 5.7
- Section 7: added sub-section 7.3.1 and 7.3.2 to distinguish Zone and Non-Zone charge calculations
- Section 10: added new section for Transmission Enhancement (TEC) (Schedule 12) Accounting
- Manual ownership changed from Rebecca Stadelmeyer to Susan Kenney

**Revision 95 (10/01/2022)**

- Conforming changes associated with ER19-1486 (Reserve Price Formation)
- Section 8.1: removed the reference of Tier II

**Revision 94 (2/24/2022)**

- 2.1: Reorganization of wording to distinguish between PJM Administrative Rates and PJM Pass-Through Rates
- 2.2: Added conforming language from FERC Order ER22-26 to describe the PJM Administrative Rates as formulas instead of as stated rates. Created subsections for the administrative rates and pass-through rates.

- 2.5: Renamed and reworded section to only be reconciliation for the PJM Scheduling System Control and Dispatch charges
- 2.6: New section to only be reconciliation for the TO Scheduling System Control and Dispatch charges

**Administrative Change: (02/04/2021, Approved by Rebecca Stadelmeyer):**

- Updated manual ownership from Ray Fernandez to Rebecca Stadelmeyer

**Administrative Change (11/06/2020) Approved by Ray Fernandez):**

- The periodic review was completed and no changes were found to be necessary

**Revision 93 (08/31/2020):**

- Section 5.2
    - o Added deadline for members to provide updates to PJM for the Network Service Peak Load (NSPL) values
    - o Noted that NSPLs will be published as final on November 15

**Revision 92 (01/01/2020):**

- Updated Section 6.1.1 to reflect an annual calculation of the demand charge border rates for Firm Point-to-Point Transmission Service
- Added Section 6.2.4 to describe an adjustment to the monthly demand border charge rate for a transmission customer taking firm point-to-point transmission service at the border with a point of delivery at a Merchant Transmission Facility

**Revision 91 (12/03/2019):**

- Updates for compliance with FERC Order 841, Electric Storage Participation in Markets Operated by RTOs and ISOs, Docket No. RM 16-23-000
    - o Added new Section 8: Energy Storage Resource Charging Energy
        - − Section 8.1: Describe different categories of Energy Storage Resource charging energy
        - − Section 8.2: List billing items that apply to Non-Dispatched Charging Energy
        - − Section 8.3: Description of billing treatment for Load Serving Charging Energy
        - − Section 8.4: Treatment of Network Service Peak Load and Obligation Peak Load/ Peak Load Contribution for Direct Charging Energy

**Revision 90 (12/06/2018):**

- Biennial Cover to Cover Review
    - o Section 2.2
        - − Replace “eRPM” with “Capacity Exchange”

- Section 5.2
  - Remove specific TOs as being network customers
  - Remove ComEd from RTO Startup Recovery Charges
- Section 5.3
  - Remove specific TOs as being network customers
- Section 6.3
  - Provided clarification on AEP and Dominion point-to-point transmission service credits
- Section 8
  - Marked Expansion Cost Recovery Accounting Overview as deleted since these charges and credits are no longer applicable.

**Revision 89 (04/01/2018):**

- Updated Section 4 for Five Minute Settlements (FERC Order 825) to replace references to “hourly” with “five minute”.

**Revision 88 (11/16/2017):**

- In Section 7, Black Start Service Accounting, added a description of how charges and credits are handled for a new Black Start unit.

**Revision 87 (2/1/2017):**

- Section 5.3 Network Integration Transmission Service Credits:
  - Removed MetEd and Penelec from TO list and added MAIT to reflect new consolidated MAIT TO entity as approved by 1/26/2017 FERC Order (ER17-214-001).

**Revision 86 (01/26/2017):**

- Cover to Cover Periodic Review
- Added language in Section 5.2 to allow for Network Service Peak Load values submitted by Electric Distribution Companies to be scaled if the values do not sum to the Annual Network Service Peak Load for the zone.
- Updated Sections 2 and 9 to include language on funding and charges for Consumer Advocates of PJM (CAPS)
- Updated the web link in Section 7 for the Black Start Revenue Requirements posting on pjm.com.
- Removed references to Manual 35 as this manual was retired on November 17, 2016.

**Revision 85 (07/15/2015):**

- In Section 5.2, remove a reference to a specific number of days in a year in the equation to calculate a customer's daily demand charge for network transmission service.

**Revision 84 (01/01/2015):**

- Remove references to ATSI Low Voltage Network Integration Service Charges. Effective 1/1/2015, ATSI no longer requires dual voltage billing.

**Revision 83 (01/01/2015):**

- Revise submission timing for peak load contributions in Section 5.2 per Docket ER15-134.

**Revision 82 (12/01/2014):**

- Revise applicable Black Start revenue requirements in Section 7 per Docket ER14-2883.

**Revision 81 (09/09/2013):**

- Conforming changes in Section 7, Black Start Service Accounting, for cost allocations to support the provision of cross-zonal black start support per Docket ER13-1911.

**Revision 80 (06/01/2013):**

- Conforming changes in Sections 3, 8, 9, and 11 to incorporate rules for Residual Zone Pricing as approved by FERC in Docket(s) ER13-347. Residual metered load pricing is effective 6/1/2015.
- Changes to incorporate EKPC integration effective 06/01/2013. Section 2.2: Update to Schedule 10 charges, Section 5.3: Added EKPC to list of zones who do not pay themselves for use of their own transmission facilities, Section 8.1 and 8.1.1: Added EKPC to zones exempt from Expansion Cost Recovery Charges

**Revision 79 (12/01/2012):**

- Black Start Service Charges Changes to Section 7 outlining the allocation of Operating Reserve Credits for the scheduling of units for Black Start service and testing of Black Start units.
- References to the eSchedules application were updated to InSchedule to reflect the recent upgrade and renaming of this PJM application

**Revision 78 (05/22/2012)**

- Section 7.2 Black Start Service Credits, updated section to comply with current version of Schedule 6A of the Tariff. The effective date for the language was November 1, 2011. The change was endorsed May 22, 2012.

**Revision 77 (01/01/2012)**

- Updates to reflect the integration of the DEOK zone

**Revision 76 (09/15/2011)**

- Section 4.1 Energy Imbalance Service Accounting Overview: Updated section to comply with current version of Schedule 4 of the Tariff.

**Revision 75 (06/01/2011)**

- Updates to reflect the integration of the ATSI zone and creation of PJM Settlement, Inc.

**Revision 74 (03/17/2010)**

- Replaced the Expansion Cost Recovery rates with a link to the PJM Guide to Billing on the pjm.com website and added the new RPM billing line items called Load Management Test Failure Charge/Credit.

**Revision 73 (06/01/2009)**

- Removed the Network Transmission Service rate/revenue requirement table and the Black Start revenue requirement table to avoid periodic manual updates and instead reference the applicable PJM.com website addresses.

**Revision 72 (3/1/2009)**

- Revised transmission revenue requirement and rate for the AEP zone (Exhibit 1).

**Revision 71 (1/01/2009)**

- Revised transmission revenue requirements and rates for PSEG and Dominion zones (Exhibit 1).
- Revised black start revenue requirements table (Exhibit 3).
- Clarified how Schedule 9 refunds apply to all quarters of the year (Section 2).
- Added descriptions of several new load reconciliation items recently implemented.

**Revision 70 (11/01/2008)**

- Revised transmission revenue requirements and rates for PSEG and PPL (Exhibit 1).
- Revised black start revenue requirements table (Exhibit 3).

**Revision 69 (08/01/2008)**

- Revised black start revenue requirements table (Exhibit 3).
- Added description for the collection of Schedule 9-MMU monthly costs to Section 2 that start in August 2008.

**Revision 68 (06/01/2008)**

- Revised Dominion network transmission revenue requirements and rates in Exhibit 1 to reflect their formula rate approved by FERC retroactively to 1/1/2008, and added the TrAILCo revenue requirement.

- Revised Network Transmission Service Credits and Firm Point-to-Point Transmission Service Credits sections to reflect the fact that the Dominion zonal share of these credits are further allocated to Dominion's network customers effective 1/1/2008.
- Revised black start revenue requirements table (Exhibit 3).
- Added description for the collection of Schedule 9-6 $AC^2$ monthly costs to Section 2 that start in June 2008.

**Revision 67 (06/01/2008)**

- Revised network transmission revenue requirements and rates table (Exhibit 1) to reflect revised formula rates.

**Revision 66 (5/1/2008)**

- Revised black start revenue requirements table (Exhibit 3).

**Revision 65 (4/1/2008)**

- Revised transmission revenue requirements for ComEd (Exhibit 1).
- Revised black start revenue requirements table (Exhibit 3).

**Revision 64 (2/1/2008)**

- Removed reactive revenue requirements table (Exhibit 1) per FERC order ER08-339.
- Revised black start revenue requirements table (Exhibit 3).

**Revision 63 (1/01/2008)**

- Revised black start revenue requirements table (Exhibit 1).
- Added ODEC as a Delmarva zonal transmission owner in Exhibit 2.
- Revised Expansion Cost Recovery Charge rates for 2008.

**Revision 62 (1/01/2008)**

- Revised reactive revenue requirements table (Exhibit 1).
- Revised black start revenue requirements table (Exhibit 4).

**Revision 61 (9/01/2007)**

- Revised reactive revenue requirements table (Exhibit 1).
- Revised black start revenue requirements table (Exhibit 4).

**Revision 60 (07/01/2007)**

- Revisions were made to reflect the implementation of Marginal Losses and for general clean-up.
- Revised reactive revenue requirements table (Exhibit 1).

- Revised black start revenue requirements table (Exhibit 4).
- Revised Section 2 to reflect Schedule 9 refunds.

**Revision 59 (06/01/2007)**

- Revisions moved to revision 60

**Revision 58 (01/01/2007)**

- Revised black start revenue requirements table (Exhibit 4).
- Revised rates in Expansion Cost Recovery Charges (Section 8).
- Revised Duquesne's network service rate and revenue requirement (Exhibit 2).
- Revised Section 2 to include new Schedules 10-NERC and 10 RFC
- Introduction trimmed to eliminate redundant information.
- List of PJM Manuals exhibit removed, with directions given to PJM Web site where all the manuals can be found.
- Revision History permanently moved to the end of the manual

**Revision 57 (10/01/2006)**

- Revised reactive revenue requirements table (Exhibit 2).
- Revised network transmission revenue requirements table (Exhibit 3).
- Revised black start revenue requirements table (Exhibit 5).

**Revision 56 (09/01/2006)**

- Revised reactive revenue requirements table (Exhibit 2).
- Revised black start revenue requirements table (Exhibit 5).

**Revision 55 (8/1/06)**

- Revise reactive revenue requirements table (Exhibit 2), revise network transmission revenue requirements table (Exhibit 3), and revise black start revenue requirements table (Exhibit 5).

**Revision 54 (6/1/06)**

- Revise reactive revenue requirements table (Exhibit 2), revise network transmission revenue requirements table (Exhibit 3), revise black start revenue requirements table (Exhibit 5), revise PJM Scheduling, System Control and Dispatch Service Accounting section to reflect PJM's stated rate implementation, and revise Expansion Cost Recovery Accounting section to reflect retroactive FERC order.

**Revision 53 (4/1/06)**

- Revise network transmission revenue requirements table (Exhibit 3), revise black start revenue requirements table (Exhibit 5), remove SECA references since the original SECA period has terminated (Section 8: Seams Elimination Cost Assignment Accounting), and remove MAAC charge references since this charge has terminated (Section 7: Mid-Atlantic Area Council Charge Accounting). Since Sections 7 and 8 were deleted, Sections 9 through 11 were renumbered accordingly.

- Revisions were made on the following pages: 29, 35, 36 and 40-45.

**Revision 52 (3/1/06)**

- Revise reactive revenue requirements table.
- Revisions were made on the following page: 23.

**Revision 51 (2/1/06)**

- Add new subsection to Network Service Accounting for business rules regarding the changing of settlement area definitions.
- Revisions were made on the following pages: 33 and 34.

**Revision 50 (1/1/06)**

- Revise reactive and black start revenue requirements tables.
- Revisions were made on the following pages: 23 and 44.

**Revision 49 (1/1/06)**

- Revise reactive and black start revenue requirements tables, add Schedule 9-OPSI billing description, and add new subsection to Network Service Accounting for nodal pricing business rules.
- Revisions were made on the following pages: 16, 19, 23, 30, 32, 33 and 44.

**Revision 48 (11/1/05)**

- Revise reactive and black start revenue requirements tables; AEP Network Service rate, revenue requirement, and pass-through credit allocations; and, Schedule 13 (Expansion Cost Recovery) billing description.

**Revision 47 (7/1/05)**

- Revise reactive and black start revenue requirements table, revise AECO, BGE, DPL, and PEPCO Network Service rates and revenue requirements, and add Schedule 13 (Expansion Cost Recovery) billing description.

**Revision 46 (5/1/05)**

- Revise reactive and black start revenue requirements table, clarify SECA settlements, and make changes to include Dominion.

**Revision 45 (2/16/05)**

- Revise reactive revenue requirements table.

**Revision 44 (1/1/05)**

- Revise reactive and black start revenue requirements tables.

**Revision 43 (1/1/05)**

- Revise reactive and black start revenue requirements tables and the AEP network integration transmission service rate. Add Duquesne's network integration transmission service revenue requirement and rate. Remove AP revenue neutrality and transitional market expansion charge sections.

**Revision 42 (12/22/04)**

- Revise to reflect FERC Regional Through and Out Rate (RTOR) elimination between PJM and MISO and the new SECA billing.

**Revision 41 (11/01/04)**

- Revise reactive and black start revenue requirements tables.

**Revision 40 (10/01/04)**

- Revise to reflect the AEP/Dayton market integration.
- Updated Exhibit 1: List of PJM Manuals to reflect new manuals

**Revision 39 (07/31/04)**

- Revised reactive revenue requirements listed in Exhibit 2 of Section 3: Reactive Supply & Voltage Control from Generation Sources Service Accounting.

**Revision 38 (06/30/04)**

- Revised reactive revenue requirements listed in Exhibit 2 of Section 3: Reactive Supply & Voltage Control from Generation Sources Service Accounting.

**Revision 37 (06/01/04)**

- Revised annual black start revenue requirements listed in Exhibit 5 of Section 11: Black Start Service Accounting.

**Revision 36 (05/01/04)**

- Globally changed all references from "*PJM Control Area*" to "*PJM Region*"
- Revised Section 2: Scheduling, System Control & Dispatch Service Accounting to incorporate the changes to PJM Service Category; Capacity Resource and Obligation Management Service (Schedule 9-5).
- Revised annual reactive revenue requirements listed in Exhibit 2 of Section 3: Reactive Supply & Voltage Control from Generation Sources Service Accounting.
- Revised annual transmission owner revenue requirements listed in Exhibit 3 of Section 5: Network Integration Transmission Service Accounting.

- Revised firm point-to-point transmission service rates listed in Exhibit 4 of Section 6: Point-to-Point Transmission Service Accounting.
- Revised Section 6: Point-to-Point Transmission Service Accounting to incorporate the changes to the Point-to-Point Transmission Service credit allocations.
- Revised Section 9: Transitional Market Expansion Accounting to incorporate the change that these charges do not apply to energy either delivered to load or input into the Transmission System in the PJM zone comprised of Commonwealth Edison.
- Added Section 10: Expansion Integration Accounting and re-numbered other sections accordingly.
- Updated PJM List of Manuals to reflect new manuals

**Revision 35 (05/01/04)**

- Revised Section 2: Scheduling, System Control & Dispatch Service Accounting to incorporate the changes to PJM Service Categories; FTR Administration (Schedule 9-2) and Market Support Services (Schedule 9-3).

**Revision 34 (04/01/04)**

- Revised annual reactive revenue requirements listed in Exhibit 2 of Section 3: Reactive Supply & Voltage Control from Generation Sources Service Accounting.

**Revision 33 (01/01/04)**

- Revised annual reactive revenue requirements listed in Exhibit 2 of Section 3: Reactive Supply & Voltage Control from Generation Sources Service Accounting.
- Revised Exhibit 1: List of PJM Manuals to reflect two new eFuel manuals

**Revision 32 (10/01/03)**

- Revised annual reactive revenue requirements listed in Exhibit 2 of Section 3: Reactive Supply & Voltage Control from Generation Sources Service Accounting.

**Revision 31 (09/01/03)**

- Revised annual reactive revenue requirements listed in Exhibit 2 of Section 3: Reactive Supply & Voltage Control from Generation Sources Service Accounting.
- Revised annual black start revenue requirements listed in Exhibit 5 of Section 10: Black Start Service Accounting.

**Revision 30 (07/01/03)**

- Revised annual reactive revenue requirements listed in Exhibit 2 of Section 3: Reactive Supply & Voltage Control from Generation Sources Service Accounting.
- Revised annual black start revenue requirements listed in Exhibit 5 of Section 10: Black Start Service Accounting.

**Revision 29 (06/01/03)**

- Revised Section 5: Network Integration Transmission Service Accounting to reflect the revised procedures to calculate the Network Customer's daily peak load contribution in accordance with FERC's order requiring the use of Network Service Peak Load (NSPL) contributions based on metered peaks instead of unrestricted peaks (Docket EL02-121).
- Changed references to “Fixed Transmission Rights” to “Financial Transmission Rights.”
- Schedule 9-5. Revised the sentence ”Usage of this service is defined as the sum of the Load-Serving Entity’s daily Accounted-For Obligations and Available Capacity Obligations during the month without any reduction for ALM Credit, plus the Capacity Resource Owner’s Unforced Capacity and Available Capacity, both measured in MWd” to “Usage of this service is defined as the sum of the Load-Serving Entity’s daily Accounted-For Obligations during the month without any reduction for ALM Credit, plus the Capacity Resource Owner’s Unforced Capacity, measured in MWd.”
- Removed the sentence. “In addition, PJM will charge a one-time sign-on fee of $5,000 for each new PJM eCapacity account.”
- Changed all references from “*PJM Interconnection, L.L.C.*” to “*PJM*.”
- Renamed Exhibits I.1 through 10.1 to Exhibit 1 through Exhibit 5.
- Reformatted to new PJM formatting standard.
- Renumbered pages to consecutive numbering.

**Revision 28 (04/01/03)**

- Revised annual reactive revenue requirements listed in Exhibit 2 of Section 3: Reactive Supply & Voltage Control from Generation Sources Service Accounting.

**Revision 27 (04/01/03)**

- Revised annual reactive revenue requirements listed in Exhibit 2 of Section 3: Reactive Supply & Voltage Control from Generation Sources Service Accounting.

**Revision 26 (02/01/03)**

- Revised annual reactive revenue requirements listed in Exhibit 2 of Section 3: Reactive Supply & Voltage Control from Generation Sources Service Accounting.

**Revision 25 (02/01/03)**

- Revised annual reactive revenue requirements listed in Exhibit 2 of Section 3: Reactive Supply & Voltage Control from Generation Sources Service Accounting.

**Revision 24 (01/01/03)**

- Revised annual reactive revenue requirements listed in Exhibit 2 of Section 3: Reactive Supply & Voltage Control from Generation Sources Service Accounting.

**Revision 23 (01/01/03)**

- Revised Annual Black Start Revenue Requirements in Exhibit 5 of Section 10: Black Start Service Accounting.

**Revision 22 (01/01/03)**

- Revised annual reactive revenue requirements listed in Exhibit 2 of Section 3: Reactive Supply & Voltage Control from Generation Sources Service Accounting. The addition of Commonwealth Chesapeake, L.L.C. was effective 11/01/02.
- Revised Section 2: Scheduling, System Control & Dispatch Service Accounting.

**Revision 21 (12/01/02)**

- Added new Section 10: Black Start Service Accounting. Re-numbered existing Section 10: Billing as new Section 11.

**Revision 20 (09/01/02)**

- Revised annual reactive revenue requirements listed in Exhibit 2 of Section 3: Reactive Supply & Voltage Control from Generation Sources Service Accounting.

**Revision 19 (07/01/02)**

- Revised annual reactive revenue requirements listed in Exhibit 2 of Section 3: Reactive Supply & Voltage Control from Generation Sources Service Accounting.

**Revision 18 (04/01/02)**

- Revised to reflect the changes to incorporate the PJM West Region and Rockland Electric Company.

**Revision 17 (01/01/02)**

- Revised annual reactive revenue requirements listed in Exhibit 2 of Section 3: Reactive Supply & Voltage Control from Generation Sources Service Accounting.

**Revision 16 (10/01/01)**

- Revised annual reactive revenue requirements listed in Exhibit 2 of Section 3: Reactive Supply & Voltage Control from Generation Sources Service Accounting.

**Revision 15 (09/01/01)**

- Revised annual reactive revenue requirements listed in Exhibit 2 of Section 3: Reactive Supply & Voltage Control from Generation Sources Service Accounting.

**Revision 14 (08/01/01)**

- Revised annual reactive revenue requirements listed in Exhibit 2 of Section 3: Reactive Supply & Voltage Control from Generation Sources Service Accounting.

**Revision 13 (07/23/01)**

- Revised annual reactive revenue requirements listed in Exhibit 2 of Section 3: Reactive Supply & Voltage Control from Generation Sources Service Accounting.

**Revision 12 (06/01/01)**

- Revised to reflect new Transmission Service and Reactive Rates.

**Revision 11 (01/01/01)**

- Revised to reflect the new unbundled PJM Scheduling, System Control and Dispatch Service accounting method (Tariff Schedule 9) and the new Mid-Atlantic Area Council Charge billing (Tariff Schedule 10) to be effective 01/01/2001.
- Removed Attachment A: Definitions and Abbreviations. Attachment A is being developed into a 'new' **PJM Manual 35: *Definitions and Abbreviations***.

**Revision 10 (10/01/00)**

- Revised to reflect the new Reactive Supply and Voltage Control from Generation Sources Service (Tariff Schedule 2) accounting method as approved by FERC (Docket No. ER00-3327) to be effective 10/01/2000.

**Revision 09 (06/01/00)**

- Sections 5, 6 & 7: Revised to reflect new point-to-point transmission service rates as approved by FERC.

**Revision 08 (09/23/99)**

- Section 2: Scheduling, System Control, & Dispatch Service Accounting
- Revised to reflect the new RTO Scheduling, System Control, & Dispatch Service (Schedule 1A) Accounting methodology which was approved by the FERC.

**Revision 07 (06/01/99)**

- Section 5: Network Integration Transmission Service Accounting
- Revised 'Exhibit 3: Annual Transmission Revenue Requirements' for AE Zone.
- Section 6: Point-to-Point Transmission Service Accounting Overview
- Revised 'Exhibit 4: Firm Point-to-Point Transmission Service Rates' for AE Zone.
- Revised 'Exhibit 5: Non-Firm Point-to-Point Transmission Service Delivery Rates' for AE Zone.

**Revision 06 (04/01/99)**

- Section 2: Scheduling, System Control, & Dispatch Service Accounting
- Added reconciliation billing for PJM and RTO Scheduling, System Control & Dispatch Services charges.

**Revision 05 (01/01/99)**

- Section 2: Scheduling, System Control, & Dispatch Service Accounting
- Added calculation of RTO scheduling, system control, and dispatch service credits and charges.

- Section 3: Reactive Supply & Voltage Control Service Accounting
- Modified calculation of Reactive Charges and Rates (Exhibit 2)
- Section 5: Network Integration Transmission Service Accounting
- Updated the RTO's Annual Transmission Revenue Requirements (Exhibit 3)
- Revised the Network Integration Transmission Service Charge calculations from monthly to daily.
- Section 6: Point-to-Point Transmission Service Accounting
- Updated Firm and Non-Firm Point-to-Point Transmission Service Rates (Exhibit 4 and 6.2)
- In addition, changes were made throughout the manual for implementation of Pennsylvania Customer Choice.

**Revision 04 (07/31/98)**

- Section 5: Network Integration Transmission Service Accounting
- Modified discussion of RTO payment for use of their own transmission facilities in "Network Integration Transmission Service Charges" and "Network Integration Transmission Service Credits"

**Revision 03 (07/01/98)**

- Section 6: Point-to-Point Transmission Service Accounting
- Corrected column headings in Exhibit 6.2.
- Corrected Non-Firm Point-to-Point Transmission Service Credit formula in "Non-Firm Transmission Service Credits" of "Point-to-Point Transmission Service Credits."

**Revision 02 (05/21/98)**

- Section 5: Network Integration Transmission Service Accounting
- Revised "Network Integration Transmission Service Charges" to correct "Monthly Service Charge" calculations.
- Section 6: Point-to-Point Transmission Service Accounting
- Revised formulas in "Non-Firm Point-to Point Transmission Service Charge Correction for Congestion" and" Non-Firm Point-to Point Transmission Service Charge Correction for Curtailments" under "Point-to-Point Transmission Service Charges."

**Revision 01 (04/17/98)**

- Revised all Sections to reference "Locational Marginal Price" rather than "Market Clearing Price."
- Deleted Attachments B, C, and D.

**Revision 00 (09/02/97)**

- This is the revised draft of the PJM Manual for Open Access Transmission Tariff Accounting.