

# PJM Manual 27:

Open Access Transmission Tariff Accounting

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Prepared by  
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## Current Revision

### **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 (12/05/2019):**

- ~~Placeholder for ESR Updates – Added Section 8~~

## 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
- Miscellaneous

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 group. 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 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 the PJM calculates charges and credits for the monthly and weekly billing statements. (See the [PJM Manual for Billing \(M-29\)](#) for more information.)

The 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 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/AC2/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 manual.

## Section 2: Scheduling, System Control and Dispatch Service (& AC2, PJMSETTLEMENT, MMU, FERC, OPSI, CAPS, NERC & RFC) 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 ancillary 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 “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 and TO scheduling, system control and dispatch service charge reconciliations are calculated for Network Transmission Customers (see “Reconciliation for PJM and TO Scheduling, System Control and Dispatch Service Charges”).

### 2.1 Scheduling, System Control and Dispatch Accounting Overview

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 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. 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 AC<sup>2</sup>
- Costs accrued for PJM Settlement, Inc.
- Costs accrued for MMU
- Payments made to FERC and OPSI

- Payments made to NERC and RFC
- Payments made to CAPS

The charges for PJM scheduling, system control and dispatch service are allocated on an unbundled basis.

Certain control center facilities of the TOs also are required to provide scheduling, system control and dispatch service, which the Transmission Customer must also purchase. 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 charge. The charges 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. 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:

- Schedule 9-1: Control Area Administration Service
- Schedule 9-2: Financial Transmission Rights Administration Service
- Schedule 9-3: Market Support Service
- Schedule 9-3: Market Support Offset
- Schedule 9-4: Regulation and Frequency Response Administration Service
- Schedule 9-5: Capacity Resource and Obligation Management Service
- Schedule 9-6: Costs of Advanced Second Control Center
- 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

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. The fixed rates associated with Schedules 9-1 through 9-5 (with quarterly refund rates to account for the prior years over or under collection) and Schedules 9-FERC, 9-OPSI, and 9-CAPS are determined annually by PJM, based on budgeted costs and forecast usage associated with those categories. Starting in June 2008, PJM began recovering costs associated with

its advanced second control center (AC<sup>2</sup>). Starting in August 2008, PJM began recovering costs associated with the Market Monitoring Unit (MMU). Starting in January 2011, PJM began recovering costs associated with PJM Settlement, Inc. The following paragraphs contain details of the calculations for each Service Category:

- **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 annually by PJM, based on budgeted costs and forecasted transmission use. 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.
- **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. This charge is 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 Rates are updated annually by PJM, based on budgeted costs, forecast FTR MWh and FTR bid/offer hours. Each FTR holder's Financial Transmission Rights Administration Service charge is equal to that member's total FTR MWh for the month multiplied by the applicable Financial Transmission Rights Administration Service Rate, plus the number of hours in all bids to buy FTR Obligations submitted by the market participant for a month, and five times the number of hours in all bids to buy FTR Options submitted by each market participant for a month multiplied by the applicable Financial Transmission Rights Administration Service Rate.
- **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. Usage of this service is comprised of two components. Component one is charged to Transmission Customers and Generation Providers using the PJM transmission system, and to market participants that submit offers to sell or bids to buy energy in the PJM Interchange Energy Market. 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 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 and is computed hourly for each Network Transmission Customer's fixed or price sensitive Demand bid, each Market Seller's Increment offer, and each Market Buyer's Decrement bid, and computed daily for each generation offer (including offers submitted into the generation rebidding period). In addition, bid/offer segments by Market Buyers or Market Sellers to schedule day-ahead Point-to-Point energy transactions into, out of, or through PJM, including "up-to" congestion 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. All rates are updated annually by PJM, and are based on budgeted costs, forecast energy MWh, and forecast number of bid/offers and may include Mitigation Factor adjustments in accordance with the rules set forth in Schedule 9-3 of the PJM Open Access Transmission Tariff. Each PJM market participant's Market Support Service charge is equal to that market participant's total Transmission Customer MWh usage for the month plus that market participant's total Generation Provider MWh usage for the month plus that market participant's total cleared bid/offer MWh for the month multiplied by the applicable Market Support Service Rate plus 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 applicable Market Support Service Rate.

- Schedule 9-3: Market Support Offset – This service category reimburses participants for the costs accrued for Schedule 9-PJM Settlement, Inc. such that overall Schedule 9 rates are not impacted by the implementation of PJM Settlement, Inc. and the recovery of its accrued costs through Schedule 9-PJMSettlement. Offsets are calculated through a monthly negative charge equal to the negative 9-3: Market Support Offset Rate times the total quantity in MWh of PJM transmission usage by Transmission Customers and Generation Providers and to market participants that submit offers to sell or bids to buy energy in the PJM Interchange Energy Market. 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.

- Schedule 9-4: Regulation and Frequency Response Administration Service - This service category comprises all of the activities of PJM associated with administering the provision of Regulation and Frequency Response Service. Usage of this service is defined as the sum the PJM Member’s Regulation Obligation (in MWh) plus the PJM Member’s Regulation scheduled (pool-scheduled and self-scheduled) from all generating units qualified to supply regulation in the PJM regulation market (in MWh) for each hour of the month. The Regulation and Frequency Response Administration Service Rate is updated annually by PJM, based on budgeted costs and forecast Regulation usage. Each PJM member’s Regulation and Frequency Response Administration Service charge is equal to that member’s total Regulation usage for the month multiplied by that month’s Regulation and Frequency Response Administration Service Rate.
- Schedule 9-5: 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 OATT Att. DD, (b) processing Network Integration Transmission Service, (c) administering the PJM capacity markets, and (d) administering and providing technical support for the RAAs. 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 MWh. The Capacity Resource and Obligation Management Service Rates are updated annually by PJM, based on budgeted costs and forecast usage. Each PJM member’s Capacity Resource and Obligation Management Service charge is equal to that member’s total usage for the month multiplied by that month’s Capacity Resource and Obligation Management Service Rate.
- Schedule 9-6: Cost of Advanced Second Control Center (AC<sup>2</sup>) - This service category recovers the actual monthly costs of owning, leasing, and operating AC<sup>2</sup> (as defined in the tariff) commencing when the first asset is declared to be in service. Total accrued costs each month are allocated across users of each of the Schedules 9-1 through 9-5. Each PJM member’s Schedule 9-6 charge is equal to that member’s usage share of total PJM usage for the month multiplied by the following cost shares allocated to each of the schedules: Schedule 9-1 (62.2%), Schedule 9-2a (1.4%) and 9-2b (0.9%), Schedule 9-3a (32.9%) and 9-3b (0.4%), Schedule 9-4 (1.5%), and Schedule 9-5 (0.7%).
- Schedule 9-PJMSettlement – This service category recovers the expenses of PJM Settlement, Inc. commencing with the establishment of PJM Settlement, Inc. Total expenses are recovered through a monthly charge equal to the 9-PJMSettlement rate times the total quantity in MWh of PJM transmission usage by Transmission Customers and Generation Providers and to market participants that submit offers to sell or bids to buy energy in the PJM Interchange Energy Market. 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.

- Schedule 9-MMU: Market Monitoring Unit (MMU) Funding - This service category recovers the expenses of the MMU (as defined in the tariff) commencing when the MMU separates from the PJM LLC. Total expenses are recovered through a monthly charge equal to the MMU Services Rate times the total quantity in MWh of PJM transmission usage by Transmission Customers and Generation Providers and to market participants that submit offers to sell or bids to buy energy in the PJM Interchange Energy Market. 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.
- Schedule 9-FERC: FERC Annual Charge Recovery – 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. FERC assesses its annual charge to PJM and other public utilities based on their total megawatt-hours of transmission of electric energy in interstate commerce. PJM will charge each user of this service each month a charge equal to the FERC Charge Recovery Rate times the total quantity in MWh of energy delivered during the month by the user as a transmission customer under the tariff for Point-to-Point (scheduled energy transactions) and Network Integration Transmission Service (load plus losses).
- Schedule 9-OPSI: Organization of PJM States, Inc. (OPSI) Funding – PJM recovers its payments to OPSI through a monthly charge equal to the OPSI Funding Rate times the total quantity in MWh of energy delivered during the month by the user as a transmission customer under the tariff for Point-to-Point (scheduled energy transactions) and Network Integration Transmission Service (load plus losses).
- Schedule 9-CAPS: The Consumer Advocates of PJM States, Inc. (CAPS) Funding – PJM recovers its payments to CAPS through a monthly charge to each customer using Network Integration and Point-to-Point Transmission Service under the Tariff equal to

the CAPS Funding Rate times the total quantity in MWhs of energy delivered to load (including losses) in the PJM Region during the month.

- Schedule 10-NERC: North American Electric Reliability Corporation (NERC) Charge – A monthly charge to recover a share of NERC’s operating costs equals the NERC rate times the total quantity of MWh of energy delivered to load (including losses) excluding the Dominion, ATSI, and EKPC Zones during the month by the user under Network Integration Transmission Service. The exclusion applicable to the ATSI Zone shall expire on January 1, 2012. Any over or under collection of NERC’s actual costs for a given calendar year will be trued up via a billing adjustment each December of that year.
- Schedule 10-RFC: Reliability First Corporation (RFC) Charge – A monthly charge to recover RFC’s operating costs equals the RFC rate times the total quantity of MWh of energy delivered to load (including losses) excluding the Dominion, ATSI, and EKPC Zones during the month by the user under Network Integration Transmission Service. The exclusion applicable to the ATSI Zone shall expire on January 1, 2012. 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

This section describes the process of calculating the TO scheduling, system control, and dispatch service charge. 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. Zone transmission use is a Transmission Customer’s Network or Point-to-Point load (including losses) within a PJM transmission zone. Non-zone transmission use is a Transmission Customer’s non-zone Network load and its point-to-point energy transactions not directly serving load in PJM. The monthly values of all Transmission Customers are summed both by transmission zone and for the total PJM Region.

Transmission Customers with zone transmission use are charged by multiplying their transmission use for each zone by the applicable zonal rate in Schedule 1A of the Tariff. Transmission Customers with non-zone transmission use are charged by multiplying their non-zone transmission use by the pool-wide rate in Schedule 1A of the Tariff.

#### PJM Actions

- The PJM accounting process prepares a list of Transmission Customers.
- The PJM accounting staff collects each TO’s zonal rate (\$/MWh).
- The PJM accounting staff collects the non-zonal rate (\$/MWh).
- The PJM accounting process retrieves the hourly list of point-to-point energy transactions for each Transmission Customer (MWh).
- The PJM accounting process calculates each Network Transmission Customer’s monthly zone transmission use (MWh) by summing the Transmission Customer’s entire hourly Network load (including losses) for each zone.

- The PJM accounting process calculates each Transmission Customer's monthly non-zone transmission use (MWh) by summing all of the Transmission Customer's hourly point-to-point energy transactions and non-zone Network load.
- The PJM accounting process calculates each Transmission Customer's TO monthly charge for use in each zone as follows:

*TO Monthly Charge for Zone Use = Transmission Customer's Zone Transmission Use \* Zonal Rate*

- The PJM accounting process calculates each Transmission Customer's TO monthly charge for non-zone use as follows:

*TO Monthly Charge for Non-Zone Use = Non-Zone Rate \* Total Non-Zone Transmission Use*

- The PJM accounting process calculates each Transmission Customer's total monthly TO scheduling, system control and dispatch service charge by summing its monthly charges for all zone and non-zone use.

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

Each TO receives a monthly TO scheduling, system control, and dispatch service credit equal to charges collected from Transmission Customers serving load in that TO's zone plus the TO's share of the charges collected from Transmission Customers serving non-zone load (e.g., non-zone network and point-to-point transmission customers). The TO's share of the charges collected from Transmission Customers serving non-zone load is determined according to the share percentage filed in Schedule 1A of the PJM Open Access Transmission Tariff.

## 2.5 Reconciliation for PJM and TO Scheduling, System Control and Dispatch Service (and AC2, MMU, FERC, OPSI, CAPS, NERC, and RFC) Charges

PJM will calculate reconciled Schedules 9, 1A, and 10 charges 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 Scheduling, System Control and Dispatch Service charge reconciliations by multiplying the kWh data (not de-rated for transmission losses) by the applicable Schedule 9, 1A, and 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. 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. Schedule 9 refunds are also reconciled in the same manner as described above.

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 for TO Scheduling, System Control and Dispatch Service charges for a month may be either a positive or a negative value.

The monthly Schedule 9-6, 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.

## 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. (See the ***PJM Manual for Transmission Operations (M-3)*** for more details.)

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 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

Each generation owner receives a monthly Reactive Supply and Voltage Control from Generation Sources Service credit equal to one-twelfth (1/12) of its annual reactive revenue requirement. The initial zonal revenue requirements based on existing settlement rates were approved by FERC on September 25, 2000 to be effective October 1, 2000 (Docket No. ER00-3327-000).

A zonal revenue requirement may be allocated or assigned to generation owners within that zone as agreed among those generation owners by informing the PJM Market Settlement Operations Department of any such agreement. Also, generation owners are free at any time to file for FERC approval of new reactive revenue requirements. The current zonal revenue

requirements are posted on the PJM website at <http://www.pjm.com/markets-and-operations/billing-settlements-and-credit.aspx>.

### 3.3 Reactive Supply and Voltage Control Charges

This section describes the process of calculating the Reactive Supply and Voltage Control from Generation Sources Service charges. Charges for reactive supply and voltage control service are calculated for zone (typically Network Customers) and for non-zone (typically Point-to-Point Transmission Customers and Network Transmission Customers in a zone with no reactive revenue requirement) load separately. The sum of all 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 transmission use on a megawatt basis.

- Monthly zone transmission use is the sum of a Transmission Customer's Network daily peak load contributions to a PJM zone and daily average Point-to-Point energy reservations where the point of delivery is within a PJM zone.
- Monthly non-zone transmission use is the sum of a Transmission Customer's non-zone Network daily peak load contributions and daily average Point-to-Point energy reservations where the point of delivery is the border of PJM.

Transmission Customers with monthly non-zone transmission use are charged a share of the total PJM pool-wide reactive revenue requirement based on their portion of the total PJM monthly transmission use. 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).

#### PJM Actions

- The PJM accounting process collects each generation owner's annual reactive revenue requirement for each zone. Monthly reactive revenue requirements equal 1/12 of the annual revenue requirements.
- The PJM accounting process retrieves the point-to-point energy reservations for each Transmission Customer.
- The PJM accounting process calculates each Transmission Customer's monthly non-zone transmission use (MW) by summing for all hours in the month all of their point-to-point energy reservations (adjusted for PJM curtailments) and dividing that value by 24, plus their daily network peak load contributions for zones that have no reactive revenue requirement.
- The PJM accounting process calculates each Transmission Customer's monthly zone transmission use (MW) by summing for all days in the month all of their daily network integration transmission service peak load contributions for each zone (see **Network Integration Transmission Service Accounting** section of the **PJM Manual for Open Access Transmission Tariff Accounting**).



- The PJM accounting process calculates charge allocations for each Transmission Customer with monthly non-zone transmission use as follows:

$$\text{Monthly Non-Zone Charge} = \left( \frac{\text{Transmission Customer's Monthly Non-Zone Transmission Use}}{\text{PJM Total Transmission Use}} \right) \times \text{PJM Total Generation Owners' Monthly Reactive Revenue Requirements}$$

- The PJM accounting process calculates an Adjustment Factor to be applied to all monthly zone charges as follows:

$$\text{Adjustment Factor} = \frac{\text{Total Monthly Zone Transmission Use for all PJM Zones}}{\text{PJM Total Monthly Transmission Use}}$$

- The PJM accounting process calculates charge allocations for each Transmission Customer with monthly zone transmission use as follows:

$$\text{Monthly Zone Charge} = \left( \frac{\text{Transmission Customer's Monthly Zone Transmission Use}}{\text{Total Monthly Zone Transmission Use in Zone}} \right) \times \text{Total Generation Owners' Monthly Reactive Revenue Requirements in Zone} \times \text{Adjustment Factor}$$

- The PJM accounting process calculates each Transmission Customer's total monthly reactive support and voltage control service charge by summing its monthly charge allocations for all zone and 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 for Operating Agreement Accounting \(M-28\)](#)*.



## 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 TOs (see “*Network Integration Transmission Service Credits*”).

### 5.1 Network Integration Transmission Service Accounting Overview

The PJM provides accounting services for Network Integration Transmission Service. Network Integration 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 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 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.

### 5.2 Network Integration Transmission Service Charges

A daily demand charge for network transmission service is calculated by the PJM for each Network Customer, including TOs, for the Zone(s) in which the Network Load of the Network Customer is located. It is based on the Network Customer’s daily network service peak load contribution (including losses), coincident with the zonal peak for the 12 months ending October

31 of the preceding year for each zone in which load is served. For non-zone network service, the customer pays the non-zone rate based on their load at the hour of the PJM regional peak for the 12 months ending October 31 of the preceding year. The preceding year's zonal peak load contributions are effective each January 1.

For Network Customers taking Network Integration Transmission Service under state required retail access programs, peak load contributions may change daily, and are expressed in tenths of a MW. These daily peak load contributions are submitted to PJM 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.

$$\text{Daily Network Service Peak Load Scaling Factor} = \frac{\text{Annual Zone Area Network Service Peak Load Allocation}}{\sum \text{Zone Area Network Service Peak Load Uploads}}$$

Network customers who are TOs do not actually pay themselves for use of their own transmission facilities. Network demand 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**

- The PJM accounting process prepares a list of Network Customers.
- The PJM accounting process retrieves the following information:
  - o Network Customer's daily peak load contribution (including losses) by zone
  - o Zonal network integration transmission service rates (\$/MW-year)
- The PJM accounting process calculates the daily demand charge for each Network Customer (\$) for each zone in which load is served as follows:

$$\text{Sum of } \left( \frac{\text{Zonal Daily Peak Load Contribution} * \text{Annual Zonal Network Integration Transmission Service Rate}}{\text{Number of days per year}} \right)$$

- The PJM accounting process calculates the demand charge for each Network Customer (\$) by summing the daily charges.
- PJM calculates the negative charge offsets for the network customers in the Allegheny Power zone based on their peak load contribution and the applicable tariff rebate rate.

- PJM calculates the AEP RTO Startup Cost Recovery charges for the network and firm point-to-point transmission customers serving load in the AEP zone.

### 5.3 Network Integration Transmission Service Credits

The monthly transmission service demand charges for Network Customers are then allocated to the appropriate TO. This allocation appears as a credit on the PJM Open Access Tariff portion of the bill.

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

#### PJM Actions

- The PJM accounting process prepares a list of Network Customers and TOs for each zone.
- The PJM accounting process retrieves the following information for each zone:
  - o Annual Transmission Revenue Requirement for each TO (\$)
  - o Demand charge for each Network and Firm Point-to-point load-serving Customer (\$)
- The PJM accounting process calculates the total Zone charges (\$) for each Zone by summing the demand charges for each Network Customer within the Zone.
- The PJM accounting process calculates the Zone revenue requirement for each Zone by summing Transmission Revenue Requirements for all TOs within that Zone.
- The PJM accounting process calculates the TOs share of the Transmission Network Service charges (\$) as follows:

$$\text{TO's Network Integration Service Credit} = \frac{\text{TO's Annual Transmission Revenue Requirement} * \text{Total Zone Charges}}{\text{Zone Revenue Requirement}}$$

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, the 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 compensate the TO(s) for any necessary transmission facility additions, consistent with FERC policy.

The TO determines the costs and provides them to PJM. The PJM then bills the appropriate Transmission Customer. 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 via their Network Integration Transmission Service agreement. 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 Schedule F-1 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 busses).

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

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

- 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 Schedule F-1 of the PJM OATT.
- B. Changes due to addition, replacement or retirement of transmission system components or metering facilities.

### Note:

Rules in the PJM OATT 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<sup>th</sup> 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.

Exhibit 1 presents the current demand charge border rates for Firm Point-to-Point Transmission Service.

Yearly Charge (\$/kW)	Monthly Charge (\$/kW)	Weekly Charge (\$/kW)	Weekday Charge (\$/kW)	Weekend/NERG Holiday (\$/kW)
18.888	1.574	0.3632	0.0726	0.0519

Exhibit 1: Firm Point-to-Point Transmission Service Rates

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 specified in Exhibit 1 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)



- o 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:
  - o List of Transmission Customer's Non-Firm Point-to-Point Transmission Service contracts
  - o Hourly demand charge rate for Non-Firm Point-to-Point transactions (\$/MWh)
  - o Hourly amount of each reservation curtailed by PJM (MW)
  - o 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 or Non-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:

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

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:
  - o Each Transmission Customer's Non-firm Point-to-Point transmission service charge (\$)
  - o Each Transmission Customer's Firm Point-to-Point transmission service charge (\$)
  - o 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 (see the ***PJM Manual for Balancing Operations (M-12)*** for more details and eligibility).

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 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. Effective December 1, 2012, the applicable Day-ahead and Balancing Operating Reserve Credits are those credits associated with the scheduling of units for Black Start service or testing of Black Start units.

### 7.2 Black Start Service Credits

Each generation owner of Black Start Units that meet the PJM and NERC criteria, receives a monthly Black Start Service credit equal to one-twelfth (1/12) of its annual black start revenue requirement. Revenue requirements for Black Start Service may include the following, where applicable: NERC CIP Capital Costs, fixed black start unit costs, variable black start costs, training expenses, fuel storage costs for liquefied natural gas, propane or oil and an incentive factor. Revenue requirements for units with the ability to disconnect from the grid automatically and remain operating at reduced levels (ALR) may only recover training costs, NERC compliance costs, and an incentive factor. For more information on Black start unit

revenue requirements, please see **Schedule 6A, PJM's Open Access Transmission Tariff (OATT)**.

A 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. 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 after PJM's acceptance of the new Black Start Unit owner's annual revenue requirement.

Monthly black start service revenues are forfeited for: units that fail a black start test and do not successfully pass a test within a ten day grace period immediately following a failed test; and, for units without a successful black start test on record with PJM within the last thirteen months.

Revenue requirements for joint-owned black start units are allocated to the owners based on their ownership shares. 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

This section describes the process of calculating the Black Start Service charges. Charges for black start service are calculated for zone (Network Customers and customers serving load with Point-to-Point Transmission Service) and for non-zone (Non-Zone Network Customers and Point-to-Point Transmission Customers) load 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 as well as a share of the applicable Day-ahead and Balancing Operating Reserve Credits that are credited to generation owners of black start units for the month. Effective December 1, 2012, the applicable Day-ahead and Balancing Operating Reserve Credits are those credits associated with the scheduling of units for Black Start service or testing of Black Start units.

Total annual black start revenue requirements will include estimated annual revenue requirements for new Black Start Units from the date the units enter Black Start Service to the last day of the month preceding PJM's acceptance of the unit's annual revenue requirement. The estimated annual revenue requirement will be based on the Black Start Unit owner's best estimate at the time the unit enters Black Start Service. Any estimated annual revenue requirement true up will be included in the monthly bill after PJM accepts the new Black Start unit's annual revenue requirement.

Each Transmission Customer's charge is calculated by determining the Transmission Customer's monthly zone and non-zone transmission use on a megawatt basis.

- Monthly zone transmission use is the sum of a Transmission Customer's Network daily peak load contributions to a PJM zone and daily average Point-to-Point energy reservations where the point of delivery is within a PJM zone.

- Monthly non-zone transmission use is the sum of a Transmission Customer's non-zone Network daily peak load contributions and daily average Point-to-Point energy reservations where the point of delivery is the border of PJM.

Transmission Customers with monthly non-zone transmission use are charged a share of the total PJM pool-wide black start revenue requirement and applicable Day-ahead and Balancing Operating Reserve Credits based on their portion of the total PJM monthly transmission use. Transmission Customers with monthly zone transmission use are charged a share of the applicable zonal black start revenue requirements and applicable Day-ahead and Balancing Operating Reserve Credits (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).

### PJM Actions

- The PJM accounting process collects each generation owner's annual black start revenue requirement for each zone. Monthly black start revenue requirements equal 1/12 of the annual revenue requirements. Annual revenue requirements for black start units that are shared and designated to serve multiple zones will be allocated by Transmission Owner designated critical load percentage to determine the amount applicable for each zone.
- The PJM accounting process collects each generation owner's day-ahead operating reserve credits and balancing operating reserve credits that are associated with the scheduling of units for black start service or black start testing for each zone. Additional details on testing of units for Black Start service can be found in PJM's Manual 12, Balancing Operations. The PJM accounting process retrieves the point-to-point energy reservations for each Transmission Customer.
- The PJM accounting process calculates each Transmission Customer's monthly non-zone transmission use (MW) by summing for all hours in the month all of their point-to-point energy reservations (adjusted for PJM curtailments) and dividing that value by 24.
- The PJM accounting process calculates each Transmission Customer's monthly zone transmission use (MW) by summing for all days in the month all of their daily network integration transmission service peak load contributions for each zone (see **Network Integration Transmission Service Accounting** section of the **PJM Manual for Open Access Transmission Tariff Accounting**).
- The PJM accounting process calculates charge allocations for each Transmission Customer with monthly non-zone transmission use as follows:

$$\text{Monthly Non-Zone Charge} = \left( \frac{\text{Transmission Customer's Monthly Non-Zone Transmission Use}}{\text{PJM Total Transmission Use}} \right)$$

× (PJM Total Generation Owners' Monthly Black Start Revenue Requirements

+ PJM Total Monthly Day-ahead and Balancing Operating Reserves Credits associated with Black Start)

- The PJM accounting process calculates an Adjustment Factor to be applied to all monthly zone charges as follows:



$$\text{Adjustment Factor} = \frac{\text{Total Monthly Zone Transmission Use for all PJM Zones}}{\text{PJM Total Monthly Transmission Use}}$$

- The PJM accounting process calculates charge allocations for each Transmission Customer with monthly zone transmission use as follows:

$$\text{Monthly Zone Charge} = \left( \frac{\text{Transmission Customer's Monthly Zone Transmission Use}}{\text{Total Monthly Zone Transmission Use in Zone}} \right)$$

× (Total Generation Owners' Monthly Black Start Revenue Requirements in Zone

+ Total Generation Owners' Monthly Day-ahead and Balancing Operating Reserves Credits associated with Black Start in Zone) × Adjustment Factor

- The PJM accounting process calculates each Transmission Customer's total monthly black start service charge by summing its monthly charge allocations for all zone and non-zone transmission use.



## Section 8: Energy Storage Resource Charging Energy

Welcome to the 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 Energy Storage Resource Charging Energy.

### 8.1 Overview of Energy Storage Resource Charging Energy

An Energy Storage Resource 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. Charging energy that is purchased for storing in an Energy Storage 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 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 and is divided into two subcategories:
  - o “Dispatched Charging Energy” shall mean Direct Charging Energy that an Energy Storage Resource Model Participant 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 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 mode).
- “Load Serving Charging Energy” shall mean energy that is purchased from the PJM Interchange Energy Market and stored in an Energy Storage Resource for later resale to end-use load. Note that only Load Serving Entities may purchase Load Serving Charging Energy. Load Serving Charging Energy 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 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 shall be considered to be providing Energy Imbalance

Service when they are dispatchable by PJM in real time. An Energy Storage 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, Tier II Synchronous 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 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 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-FINCON, 9-MMU, and 9-PJM Settlement
- Schedule 10-NERC and 10-RFC
- Network Integration Transmission Service
- Network Transmission Service Offset
- Network Integration Transmission Service (ATSI Low Voltage)
- MTEP Project Cost Recovery
- Transmission Enhancement
- Other Supporting Facilities
- Non-Firm Point-to-Point Transmission Service
- RTO Start-up Cost Recovery
- Black Start Service
- Unscheduled Transmission Service
- Reactive Supply and Voltage Control from Generation and Other Sources Service

An Energy Storage 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 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 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 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)
- Expansion Cost Recovery (charges/credits)
- RTO Start-up Cost Recovery (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)
- Peak Season Maintenance Compliance Penalty (charges/credits)
- Peak-Hour Period Availability (charges/credits)
- Demand Resource and ILR Compliance Penalty (charges/credits)
- Qualifying Transmission Upgrade Compliance Penalty (charges/credits)
- Load Management Test Failure (charges/credits)

## Revision History

### **Revision 91 (12/05/2019):**

- **Placeholder for ESR Updates – Added Section 8**

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

- Biennial Cover to Cover Review
  - o Section 2.2
    - Replace “eRPM” with “Capacity Exchange”
  - o Section 5.2
    - Remove specific TOs as being network customers
    - Remove ComEd from RTO Startup Recovery Charges
  - o Section 5.3
    - Remove specific TOs as being network customers
  - o Section 6.3
    - Provided clarification on AEP and Dominion point-to-point transmission service credits
  - o 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:
  - o 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](http://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<sup>2</sup> 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.