



*Working to Perfect the Flow of Energy*

PJM Manual 2:  
Transmission Service  
Request

Revision: ~~1011~~

Effective Date: ~~May 15, 2007~~

Prepared by  
Tariff Integration

© PJM 2007



# Transmission Service Request

## Table of Contents

|   |                         |
|---|-------------------------|
| <b>Table of Contents</b> .....  | <b>iv</b>               |
| <b>Table of Exhibits</b> .....  | <b>iii</b>              |
| <b>Approval</b> .....   | <b>1</b>                |
| <b>Current History</b> .....  | <b>1</b>                |
| <b>Introduction</b> .....   | <b>2</b>                |
| <b>ABOUT PJM MANUALS</b> .....  | <b>2</b>                |
| ABOUT THIS MANUAL.....  | 2                       |
| References.....   | 3                       |
| USING THIS MANUAL.....  | 443                     |
| What You Will Find In This Manual.....  | 443                     |
| <b>Section 1: Transmission Service Request Process</b> .....                          | <b>5</b>                |
| <b>TRANSMISSION SERVICES OFFERED</b> .....  | <b>5</b>                |
| Point-To-Point Transmission Service .....   | 5                       |
| Network Transmission Service .....  | 7                       |
| APPLYING FOR AUTHORIZATION.....   | 7                       |
| POINT-TO-POINT TRANSMISSION SERVICE REQUESTS (REFERENCE NERC STANDARD MOD-001-0)..... | 7                       |
| OASIS Requests for Transmission Service.....  | 8                       |
| Written Requests for Long-Term Firm Service .....                                     | 8                       |
| Short-Term Firm Transmission Service Requests (Reference NERC standard MOD-001) ..... | 9                       |
| Short-Term Non-Firm Transmission Service Requests .....                               | 10                      |
| <b>Non-Designated Resource Delivery to Designated Loads</b> .....                     | <b>10</b>               |
| PJM Network Import Transmission Service Requests .....                                | 11                      |
| NETWORK SERVICE REQUESTS .....  | 12                      |
| PJM Response to Request.....  | 12                      |
| EVALUATION OF TRANSMISSION SERVICE REQUESTS .....                                     | 12                      |
| PJM Methodology and ATC Complaint Forum (Reference NERC standard MOD-003-0).....      | 13                      |
| <b>Section 2: Available Transfer Capability Calculations</b> .....                    | <b>14</b>               |
| PJM ATC OVERVIEW (REFERENCE NERC STANDARD MOD-001-0).....                             | 14                      |
| PJM AFC/ATC PRINCIPLES AND PHILOSOPHY (REFERENCE NERC STANDARD MOD-001-0) .....       | 15                      |
| Financial Transmission Rights (FTRs).....   | 16                      |
| ATC PROCESSING.....   | 17                      |
| PJM AFC Process Overview.....   | 17                      |
| ATC Calculation .....   | 19                      |
| Base Case Preparation.....  | 19                      |
| <b>Analysis</b> .....   | <b>19</b>               |
| PJM OASIS .....   | 20                      |
| Posted Paths.....   | 20                      |
| OASIS Service Types- OASIS Decrementing .....   | 20                      |
| Calculation Frequency for all Paths on OASIS.....                                     | 21                      |
| TRANSMISSION MARGINS (REFERENCE NERC STANDARD MOD-001-0).....                         | 21                      |
| Capacity Benefit Margin (Reference NERC standard MOD-006-0) .....                     | 21                      |
| Use of CBM (Reference NERC standard MOD-006-0) .....                                  | 22                      |
| Documentation of CBM (Reference NERC standard MOD-007-0) .....                        | 22                      |
| Transmission Reliability Margin (Reference NERC standard MOD-008-0).....              | <del>23</del> <b>23</b> |
| Incorporating Margins (Reference NERC standard MOD-008-0).....                        | 23                      |



---

|   |           |
|---|-----------|
| <i>Regional Coordination (Reference NERC standard MOD-004-0)</i> .....                    | 23        |
| <b>Section 3: Long Term Firm Transmission Service Request Evaluation Process</b><br>..... | <b>25</b> |
| <i>Long Term/Network Service Request Evaluation</i> .....                                 | 25        |
| <b>Revision History</b> .....   | <b>31</b> |



**Table of Exhibits**

EXHIBIT 1: PJM TRANSMISSION SERVICES..... 5  
EXHIBIT 2: PURCHASING TRANSMISSION SERVICE USING OASIS ..... 8  
EXHIBIT 3: AFC/ATC SYSTEM FLOW ..... 19  
EXHIBIT 4: LONG TERM FIRM TRANSMISSION SERVICE REQUEST PROCESS .....25

## Approval

Approval Date: ~~05/15/2007~~  
Effective Date: ~~05/15/2007~~

Chris Advena, Tariff Integration

## Current History

### **Revision ~~10-11~~ (~~May 15, 2007~~)**

- ~~• Section 1: Updated timing requirements as per OATT 3/1/2007.~~
- ~~• Updated various hyperlinks to OASIS website due to change in domain~~
- ~~• Updated timing requirements as per new Tariff.~~
- ~~• Updated links to new OASIS website.~~
- ~~• 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.~~
- ~~• Listed references to NERC MOD requirements. RFC and SERC regulatory standards reflect the NERC requirements of MOD-000 through MOD-008, therefore references to requirements in this manual will show the NERC standard~~

## Introduction

Welcome to ***PJM Manual for Transmission Service Request***. In this Introduction, you will find the following information:

- What you can expect from PJM Manuals in general (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 PJM for the operation, planning, and accounting requirements of PJM and PJM Energy Market. The manuals are grouped under the following categories:

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

For a complete list of all PJM Manuals, go to [www.pjm.com](http://www.pjm.com) and select “Manuals” under the “Documents” pull-down menu.

### **About This Manual**

The ***PJM Manual for Transmission Service Request*** is one of a series of manuals within the Transmission manuals. This manual focuses on the process of the Transmission Customer’s requests for transmission service. It includes a description of the calculations, assessment, and studies by PJM required to process the requests for transmission service and determine the adequacy of the PJM RTO transmission service facilities to accommodate the request.

The ***PJM Manual for Transmission Service Request*** consists of three sections. The sections are listed in the table of contents beginning on page ii.

The intended audiences for The ***PJM Manual for Transmission Service Request*** are:

- *Transmission Customers* - Both PJM Members and Load Serving Entities (LSE) who purchase transmission service.
- *PJM Member Relations Department staff* - This department is responsible for the transmission service application process.
- *PJM Tariff ~~Integration~~ Integration Department staff* - This department is responsible for processing the transmission service requests, ATC calculations,

and the associated system studies. This department is also responsible for PJM OASIS.

## References

The references to other documents that provide background or additional detail directly related to The ***PJM Manual for Transmission Service Request*** are:

- [PJM Open Access Transmission Tariff \(OATT\)](#)
- PJM Manual [Open Access Transmission Tariff Accounting \(M-27\)](#)
- PJM [OASIS Operations Manual](#)
- [PJM OASIS http://oasis.pjm.com](http://oasis.pjm.com)
- PJM Regional Practices <http://oasis.pjm.com>
- *NERC Available Transfer Capability Definitions and Determination* — A framework for determining available transfer capability of the interconnected transmission network for a commercially viable electricity market, North American Electric Reliability Council - June, 1996.
- *NERC Transmission Transfer Capability* — A Reference Document for Calculating and Reporting the Electric Power Transfer Capability of Interconnected Electric Systems, North American Electric Reliability Council, May 1995.
- *Standards and Communication Protocols for Open Access Same-Time Information System*, September 10, 1996, (appended to Order No. 889, Final Rule, FERC, April 24, 1996).
- PJM Import Capability Study Procedure Manual, September 1, 1996
- CETO Procedures and Methods, May 1996
- PJM Sub-Area Capacity Emergency Transfer Limit (CETL) Methodology, January 24, 1997
- [MISO-PJM Joint Operating Agreement \(JOA\), April 2004.](#)
- [Midwest ISO-PJM Joint Operating Agreement \(JOA\), April 2004.](#)
- [Midwest ISO, PJM, and TVA Joint Operating Agreement \(JOA\), April 2004.](#)
- [NYISO-PJM Joint Operating Agreement \(JOA\), April 2004.](#)
- [PEC-PJM Joint Operating Agreement \(JOA\), January, 2010.](#)
- [Congestion Management Procedure \(CMP\).](#)
- [Financial Transmission Rights Manual M-06](#)  
<http://www.pjm.com/~media/documents/manuals/m06.ashx>
- [Available Transmission Capability Implementation Document \(ATCID\)](#)  
<ftp://ftp.pjm.com/oasis/ATCID.pdf>

- [Capacity Benefit Margin Implementation Document \(CBMID\)](ftp://ftp.pjm.com/oasis/CBMID.pdf)  
<ftp://ftp.pjm.com/oasis/CBMID.pdf>
- [Transmission Reliability Margin Implementation Document \(TRMID\)](ftp://ftp.pjm.com/oasis/TRMID.pdf)  
<ftp://ftp.pjm.com/oasis/TRMID.pdf>

## Using This Manual

We believe that explaining concepts is just as important as presenting the 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.

## 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: Transmission Service Request Process

Welcome to the *Transmission Service Request Process* section of The PJM Manual for **Transmission Service Request**. In this section you will find the following information:

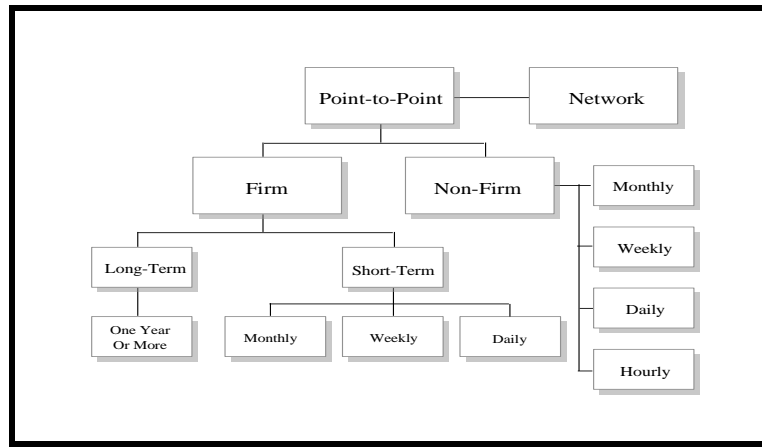
- A description of the services offered (see “*Transmission Services Offered*”).
- A description of the process to become eligible for services (see “*Applying for Authorization*”).
- How to request transmission service (see “*Point-to-Point Transmission Service Requests*” and “*Network Service Requests*”).
- How transmission service requests are evaluated (see “*Evaluation of Transmission Service Requests*”).

### **Transmission Services Offered**

*(Reference NERC standard MOD-001-0)*

The transmission services available to eligible customers are listed in PJM RTO Open Access Transmission Tariff ([PJM OATT](#)). Customers make requests to PJM [on the PJM OASIS](#) for the desired transmission services. PJM evaluates each Transmission Service Request to determine the impact to the system and accepts or refuses the request for the transmission service. Questions or requests for information regarding transmission service must be made to PJM Member Relations Department (610-666-8980) , or the OASIS Hotline (610-666-8972).

Exhibit 1 lists the transmission services available for PJM RTO.



*Exhibit 1: PJM Transmission Services*

### **Point-To-Point Transmission Service**

Point-to-~~point~~ ~~Point transmission~~ ~~Transmission service~~ ~~Service~~ is the use of transmission facilities for the transmission of capacity and energy between a Point of Receipt (POR) and a Point of Delivery (POD). In the PJM RTO Open Access Transmission Tariff, Firm and Non-

Firm Point-to-Point transmission service are offered for terms of various durations. Point-to-Point transmission service can be used for the transmission of capacity and/or energy into, out of, through, or within the PJM RTO.

### Firm Point-To-Point Transmission Service

Firm transmission service is reserved and/or scheduled between specified Points of Receipt and Delivery. The minimum term of Firm Point-To-Point Transmission Service is one day. The maximum term of Firm Point-to-Point transmission service is determined based on available transfer capability for future periods and is specified in the Service Agreement. Firm Point-To-Point Transmission Service has reservation priority over Non-Firm Point-To-Point Transmission Service. Financial Transmission Rights (FTR) may be requested when reserving Firm Point-to-Point Transmission Service. See Manual 6, Financial Transmission Rights for details.

#### There are two categories of Firm Point-to-Point Transmission Service:

- Long-Term Firm Point-To-Point Transmission Service

Long-Term Firm Point-To-Point Transmission Service has a term of one year or more. Long-Term Firm Point-To-Point Transmission Service is available on a first-come, first-served basis (i.e., in the order in which each transmission customer reserves service). Long-Term Firm Point-To-Point Transmission Service has equal reservation priority with Native Load Customers and Network Customers.

- Short-Term Firm Point-To-Point Transmission Service

Short-Term Firm Point-To-Point Transmission Service has a term of less than one year, is available on a first-come-first-served-basis, and is subservient to Long-Term Firm Service. A transmission customer taking FIRM transmission service may elect to change its Points of Receipt and Delivery to obtain service on a Non-Firm basis consistent with the terms of section 22.1 of the PJM tariff. A customer requesting a modification of the Points of Receipt or Delivery of a Firm service request on a non-firm basis must submit a day-Secondary request on the OASIS by noon one business day in advance (note: Secondary service is offered only on a daily basis).

### Non-Firm Point-To-Point Transmission Service

Non-Firm Point-To-Point Transmission Service is available from transmission capability in excess of that needed for reliable service to Native Load Customers, Network Customers, and other Transmission Customers taking Long-Term and Short-Term Firm Point-To-Point Transmission Service.

Non-Firm Transmission Service is reserved and/or scheduled between specified Points of Receipt and Delivery. Non-Firm Point-To-Point Transmission Service is available for the following periods:

- hourly
- daily
- weekly

- monthly

## Network Transmission Service

Network Transmission Service (PJM Network Integration Transmission Service) allows network customers to utilize their network resources to serve their network load located in the PJM RTO. The customer purchasing Network Transmission Service must also obtain or provide Ancillary Services.

Network Transmission Service is used for the transmission of capacity and energy from network resources within or deliverable to PJM RTO and energy from The PJM Energy Market to network loads. Each network customer can integrate its current and planned network resources to serve its network load in a manner comparable to that in which Load Serving Entities who are also transmission owners utilize PJM RTO Transmission Service Facilities to serve their native load customers. Network Transmission Service also may be used by a network customer to deliver economy energy purchases to its network load from non-designated resources.

PJM plans and coordinates with the transmission owners for the enhancement, expansion, operation and maintenance of PJM RTO transmission service facilities in order to provide all network customers with Network Transmission Service.

## Applying for Authorization

To become an eligible transmission service customer, a Transmission Service **Enabling Agreement (TSA)** must be prepared by PJM, signed by the applicant, and approved by the FERC. In addition, a credit worthiness check must be completed. The eligibility process consists of the following steps.

- Step One - The Transmission Service Application Form, consisting of a cover letter, various Forms of Agreement for Transmission Service, a Transmission Service Enabling Agreement, and a credit worthiness form is available from PJM Home page. Questions concerning the application/authorization process should be directed to PJM Member Relations Department (610-666-8980).
- Step Two - Complete the application form and return it to PJM Member Relations Department.
- Step Three - If an application is approved, PJM files the original blanket agreement with FERC, either Attachment A (Firm Point To Point), Attachment B (Non-Firm Point-To-Point), Attachment F (Network Integration Transmission Service), or Attachment F1 (Network Integration Transmission Service under State Requirement Retail Access Programs), depending on the service desired. PJM enables access to PJM's OASIS and notifies the customer.
- Step Four - If the application is not approved by PJM, the applicant is notified.

## Point-to-Point Transmission Service Requests

*(Reference NERC standard MOD-001-01)*

All Point-to-Point Transmission Service requests must be made on the PJM OASIS. Information including path-name, Point of Delivery, Point of Receipt, source, sink, time

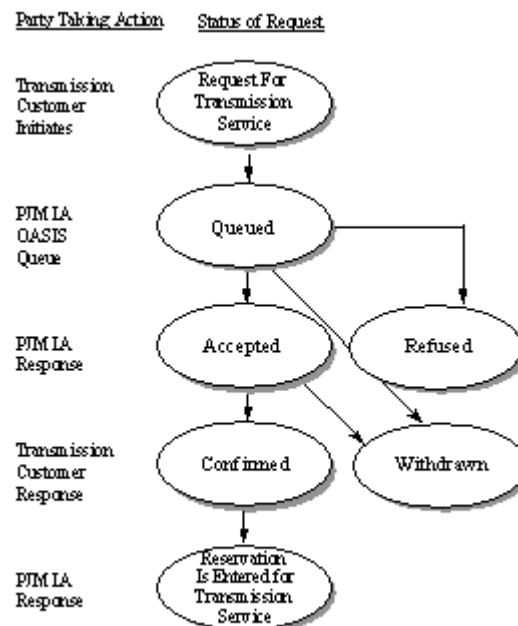
block, capacity, capacity type, begin date/time and end date/time must be identified with each request. More details on procedures for making a transmission service request via The PJM OASIS are contained in the PJM OASIS Users Guide at

(<http://www.pjm.com/etools/oasis/user-guide.html>) (<http://www.pjm.com/markets-and-operations/etools/oasis/oasis-user-guide.aspx>). In addition, a written application must be submitted to PJM for long-term firm requests.

### OASIS Requests for Transmission Service

Eligible transmission customers use the PJM OASIS to request transmission service. Eligible customers must complete the appropriate Transmission Service Agreement (see “Applying for Authorization”) before transmission service requests can be made. The transmission customer must also register on OASIS in order to make requests for transmission service. The OASIS registration process and user instructions for the OASIS are included on the PJM OASIS Internet web page

(<http://oasis.pjm.com> <http://www.pjm.com/etools/oasis.html>). The steps for the OASIS transmission service request are depicted on Exhibit 2.



### Exhibit 2: Purchasing Transmission Service Using OASIS

#### Written Requests for Long-Term Firm Service

In addition to the OASIS requests, written requests are submitted to PJM by eligible customers requesting Long Term Firm Transmission Service.

The written request process consists of the following:

The written request for long-term transmission service must be submitted to the Member Relations Department. (Attachment A from PJM OATT with specification pages completed.)

- Step One. The Transmission Department is notified of the Transmission Service Request and reviews the customer's transmission service request, as defined in Section 2 of the PJM OATT.
- Step Two. Member Relations will notify the customer of the results of the Transmission Department review.
- Step Three. If the request is approved, the transmission service is accepted.
- Step Four. If the request is not approved, the customer can request a standard "System Impact Study" or a "Detailed System Impact Study."

### Short-Term Firm Transmission Service Requests

(Reference NERC standard MOD-001)

All short-term firm transmission service requests are made on PJM OASIS. Refer to PJM Regional Practices section 1.3 Short-Term Firm Point-to-Point Transmission Service Requests at <http://oasis.pjm.com> for information. ~~The following information must be submitted with each request:~~

~~location of Point(s) of Receipt/Delivery and identities of delivering/receiving PJM Members~~

~~location of generating facilities~~

~~description of the supply characteristics~~

~~estimate of expected capacity and energy deliveries~~

~~Service Commencement Date and the term of the requested transmission service~~

~~Transmission capability~~

~~Short-term firm transmission service requests are granted based on the available transmission capability and the duration of the request on a first-come, first-served basis as outlined in section 13.2 of PJM tariff.~~

**NOTE:** Requests for annual or long-term transmission service may pre-empt shorter-term Firm service on a last-in/first-out basis if necessary (see section 1.7 of the Regional Transmission and Energy Scheduling Practices, <http://oasis.pjm.com/rpdoc.html>).

~~Monthly short-term firm transmission service requests are made on a calendar month basis and must be submitted by a transmission customer via the PJM OASIS, no earlier than 00:00, the first business day, 17 calendar months prior to the commencement of service and no later than 00:00, 14 days prior to the commencement of service (see Note above). PJM responds, via the PJM OASIS, within the agreed time frame, as per the tariff, with a status of "ACCEPT", "REFUSE", or "COUNTER OFFER". The transmission customer must then "CONFIRM" or "WITHDRAW" the request, by the earlier of (1) noon on the day before service begins or (2) by the close of business, the 15th day after receiving PJM's response, whichever is applicable. Otherwise, the request is deemed withdrawn.~~

~~Weekly short-term firm transmission service requests must be submitted via the PJM OASIS no earlier than 00:00 hours of the first PJM business day, two weeks (14 days) prior to the commencement of service, and no later than 00:00 seven days prior to the commencement of service. Weeks are considered Monday 00:00 – Monday 00:00. PJM responds, via the PJM OASIS, within two PJM business days of receiving the request with a status of~~

~~“ACCEPT”, “REFUSE”, or “COUNTER OFFER”. The transmission customer must then “CONFIRM” or “WITHDRAW” the request by noon one day prior to service, otherwise the request is deemed withdrawn.~~

~~Daily short-term firm transmission service requests must be submitted via the PJM OASIS no earlier than 00:00 seven PJM business days prior to the commencement of service, and no later than 1400, one PJM business day prior to the commencement of service. PJM responds, via the PJM OASIS, within four PJM business hours of receiving the request with a status of “ACCEPT”, “REFUSE”, or “COUNTER OFFER”. The transmission customer must then “CONFIRM” or “WITHDRAW” the request by noon one day prior to service, otherwise the request is deemed withdrawn.~~

~~All energy schedules associated with short-term firm transmission service requests must be submitted one business day in advance of actual energy loading. Schedules submitted after 10:00 are processed when practicable.~~

### **Short-Term Non-Firm Transmission Service Requests**

All Short-Term Non-Firm Transmission Service Requests are made on the PJM OASIS. Refer to PJM Regional Practices section 1.4 Short-Term Non-Firm Point-to-Point Transmission Service Requests at <http://oasis.pjm.com> for information. The following information must be submitted with each request:

- ~~• location of Point(s) of Receipt and Delivery~~
- ~~• maximum amount of capacity requested~~
- ~~• proposed dates and hours for initiating and terminating service~~
- ~~• LMP of the initial source of power (source)~~
- ~~• LMP of the ultimate load (sink)~~

~~Monthly Non-Firm Transmission Service Requests must be submitted via the PJM OASIS no earlier than 00:00 hours of the first PJM business day, two calendar months prior to the commencement of service, and no later than 00:00, two days prior to the commencement of service. Requests are made on a calendar month basis. PJM responds, via the PJM OASIS, within twelve hours of receiving the request with a status of “ACCEPT”, “REFUSE”, or “COUNTER OFFER”. The transmission customer must then confirm or withdraw the request within four hours of receiving PJM’s response, otherwise the request is deemed withdrawn.~~

~~Weekly Non-Firm Transmission service requests must be submitted via the PJM OASIS no earlier than 00:00 hours of the first PJM business day, two weeks prior to the commencement of service, and no later than 00:00, thirty hours prior to the commencement of service. Weeks are considered Monday-Sunday. PJM responds, via the PJM OASIS, within four hours of receiving the request with a status of “ACCEPT”, “REFUSE”, or “COUNTER OFFER”. The transmission customer must then confirm or withdraw the request within two hours of receiving PJM’s response, otherwise the request is deemed withdrawn.~~

~~Daily Non-Firm Transmission service requests must be submitted via the PJM OASIS no earlier than 00:00, three PJM business days prior to the commencement of service, and no later than 1400 hours, one day prior to the commencement of service. PJM responds, via the PJM OASIS, within 30 minutes of receiving the request with a status of “ACCEPT”,~~

~~“REFUSE”, or “COUNTER OFFER”. The transmission customer must then confirm or withdraw the request within 30 minutes of receiving PJM’s response, otherwise the request is deemed withdrawn (retracted).~~

~~Hourly Non-Firm Transmission Service Requests must be submitted via the PJM OASIS no earlier than 1400 one PJM business day in advance, and no later than 1 hour prior to the commencement of service. Same day hourly requests must be submitted as pre-confirmed requests on the OASIS. PJM responds to requests, via the PJM OASIS, within 15 minutes of receiving the request with a status of “ACCEPT”, “REFUSE”, or “COUNTER OFFER”. Upon acceptance of a same day request, the request status automatically becomes “CONFIRMED”. For next day requests, the transmission customer must confirm or withdraw the request within 15 minutes of receiving PJM’s response, otherwise the request is deemed withdrawn by PJM.~~

## Non-Designated Resource Delivery to Designated Loads

Non-Designated Resource Delivery to Designated Loads is defined as Network Transmission use by PJM Load Serving Entities to serve customer load from Non-Designated Resources located outside the PJM RTO. Refer to PJM Regional Practices section 1.5 PJM NETWORK Transmission Service Requests at <http://oasis.pjm.com> for information. ~~These requests have a higher reservation priority than Non-Firm Transmission Service Requests, but are curtailed before Firm Transmission Service. Below are definitions for Transmission Network Use and Designated Load.~~

~~—— Transmission Network Use~~

~~—— Network Customer’s (Section 1.20 of the OATT) use of transmission service pursuant to the terms of the Transmission Provider’s Network Integration Transmission Service under Part III of the tariff.~~

~~—— An RTO’s use of the Transmission System to serve its Native Load Customers in a manner comparable to that in which Network Integration Transmission Service allows the Network customer to integrate, economically dispatch, and regulate its current and planned Network Resources to serve its Network Load.~~

~~—— Designated Load~~

~~—— Network Load (Section 1.22 of the OATT)~~

~~—— Native load for which an RTO utilizes the Transmission System in a manner comparable to that in which Network Integration Transmission Service allow the Network Customer to integrate, dispatch, and regulate its current and planned network resources to serve its network load~~

## PJM Network Import Transmission Service Requests

Each Transmission Network use delivering Non-Designated Resources to serve PJM Designated Load must be requested on The PJM OASIS. Refer to PJM Regional Practices section 1.5 PJM NETWORK Transmission Service Requests at <http://oasis.pjm.com> for information. ~~Additionally, use of the transmission system for delivery of Non-Designated~~

~~Resources to a company's Designated Load in excess of that company's load ratio share of PJM network import ATC must be requested separately as Spot Import (network service delivered to RTO load) or Non-firm, Point-to-Point Transmission Service on the OASIS and will compete with other such requests for priority and availability. Non-firm, Point-to-Point Transmission Service requests must be submitted via the PJM OASIS following the guidelines outlined above for Short-Term Non-Firm Transmission Service Requests.~~

## Network Service Requests

~~Refer to PJM Regional Practices section 1.5 PJM NETWORK Transmission Service Requests at <http://oasis.pjm.com> for information. Notice must be posted on the OASIS of all requests for Network Transmission Service. Applications requesting Network Transmission Service must be submitted to PJM in writing. The application must be submitted to PJM in sufficient time for PJM to conduct Impact Studies that may be needed prior to the commencement of service and therefore, prior to the granting of capacity credit for any resources associated with the requested service. Completed applications for Network Transmission Service for a given planning period that are received during the annual solicitation period associated with that planning period are assigned the same priority. Planning periods run from June 1 of a given year through May 31 of the following year. The annual solicitation period associated with a given planning period is March 1 through March 31 of the year two calendar years prior to the start of the given planning period.~~

## PJM Response to Request

~~Refer to PJM Regional Practices section 1.6 Table Summary: Transmission Service Submittals at <http://oasis.pjm.com> for information on how PJM acknowledges the request for Network Transmission Service, within 10 days of receipt. The acknowledgment includes a date by which a response, including a Service Agreement, is sent to the eligible customer.~~

~~If an application fails to meet the requirements, PJM notifies the eligible customer requesting service within 15 days of receipt and specifies the reasons for such failure. Wherever possible, PJM attempts to remedy deficiencies in the application through informal communications with the eligible customer. If such efforts are unsuccessful, PJM returns the application to the eligible customer and requests the customer to file a new or revised application that fully complies with the requirements of this section. The eligible customer is assigned a new priority consistent with the date of the new or revised application. PJM treats this information consistent with the standards of conduct contained in Part 37 of the FERC's regulations.~~

## Evaluation of Transmission Service Requests

Once a Transmission Service Request is received ("study on OASIS") the evaluation process begins. Each request for transmission service is evaluated by PJM to determine if there is sufficient capability to accept the request and ensure reliable service to all transmission customers.

Available Transfer Capability is the capability remaining in the network above that which is already committed. ATC is computed by the Transmission Department. The ATC calculations are described in Section 2 of this manual.

All Transmission Service Requests are evaluated by PJM based on posted ATC and other reliability analysis. If there is available transmission capability and there are no known reliability problems, the transmission service request is approved. Once PJM has accepted the request, the ATC posting is adjusted to reflect the new transmission service reservation. All requests for Network Transmission Service, monthly firm point-to-point transmission service and long-term firm point-to-point are subject to the System Impact Studies detailed in Section 3 of this manual.

### **PJM Methodology and ATC Complaint Forum**

*(Reference NERC standard MOD-003-0)*

PJM transmission customers, providers, and those wishing to offer comments, submit questions or complaints regarding the methodology or resulting ATC values posted, can do so by calling, or e-mailing PJM Member Relations Department. PJM Member Relations Department can be reached at (610-666-8980) or <http://www.pjm.com/about-pjm/member-services.aspx> and select CONTACT INFORMATION and US-Member Services on the top-bottom right of the display. A PJM representative will respond to phone contacts within one business day and web submittals within one week. Responses will be made by letter, phone, or email. All communications received will be addressed and a formal response sent. If the response is deemed unsatisfactory, commenters can use the Dispute Resolution Process in Schedule 5 of the PJM Operating Agreement.

## Section 2: Available Transfer Capability Calculations

Welcome to the *Available Transfer Capability Calculations* section of **PJM Manual for Transmission Service Request**. In this section, you will find the following information:

- An overview section that highlights ATC principles and philosophies summarizes the ATC calculation, application of margins and posting processes (see “*PJM ATC Overview*”).
- A summary of the rules and principles that are the basis for PJM ATC calculations, and the PJM philosophy used to develop the ATC base cases (see “*AFC/ATC Principles and Philosophy*”).
- A list of the ATC information that PJM posts on OASIS and how ATC decrementing occurs. (see “*PJM OASIS*”).
- A discussion of how PJM performs the basic ATC calculations (see “*ATC Processing*”).
- A discussion of margins applied to determine ATC (see “*Transmission Margins*”).

### PJM ATC Overview

(Reference NERC standard MOD-001-01)

The following is a general overview of the key points of the ATC evaluation process. For additional details please refer to the sections that follow [and the ATCID](#).

- PJM procedures for determining ATC comply with the principles outlined by NERC and conform to existing FERC requirements.
- PJM recognizes the importance of regional coordination and its impact on transfer capability. Tools are in place to maintain reliability of the bulk interconnected transmission system and to ensure the proper exchange of operating data.
- TTC and ATC serve as an indicator of the adequacy of the transmission system to reliably transfer energy over transmission facilities.
- ~~As specified in PJM OASIS Manual 4,~~ PJM determines and posts TTC, Firm, and Non-Firm ATC paths.
  - Hourly (hours ‘1’ to ‘168’)
  - Daily (days ‘1’ to ‘35’)
  - Weekly (week ‘1’ to ‘5’)
  - Monthly (months ‘1’ to ‘18’)
- Three ~~programs-processes~~ are used to calculate ATC:
  - ~~PSS/e-m~~Model builder (monthly, weekly, daily, and/or hourly base cases)
  - ~~PTI-MUST~~-AFC Calculator (calculates Available Flowgate Capability)
  - AFC-ATC Converter (translates AFC values to ATC values)
- Frequency of Calculation: (Reference NERC standard MOD-001-01 ~~R84.5~~)

- The ATC values for all time frames are automatically recalculated hourly.
- Calculated Paths:
  - Refer to the OASIS [Manual \(04\) and OASIS User Guide Regional Practice section 1.1](#) for details on ~~the currently available~~ calculated paths. [A current list of paths is available on the PJM OASIS by selecting PJM Info, then PJM Transmission Paths link.](#)
- ATC is highly dependent on system conditions (generation/topology). The uncertainty of future forecasted system conditions results in a greater degree of uncertainty in future forecasted transfer capability, with an expected lower ATC value for longer-term postings.
- Margins are applied to protect against the over allocation of the transmission system.
- Margins are time, direction, and transmission service type dependent.
- Applied margins may decrease as analysis time approaches real-time.
- OASIS postings are decremented upon transmission service acceptance.
- OASIS decrementing recognizes the simultaneous effects of transmission reservations on parallel paths.

## PJM AFC/ATC Principles and Philosophy

(Reference NERC standard MOD-001-01 and Mod-030-02)

PJM procedures for determining Available Transfer Capabilities (ATC) follow the [principles outlined by](#) the North American Electric Reliability Council's (NERC) [Transmission Transfer Capability Task Force MOD standards](#). They conform to the Federal Energy Regulatory Commission's (FERC) final rules pertaining to promotion of wholesale electric competition through open access non-discriminatory transmission service and development of an open access same-time information system (orders 888 and 889, respectively). [Refer to the ATCID for more information.](#)

~~PJM ATC and TTC calculations are based on the NERC recommended measures. The NERC report, Available Transfer Capability Definitions and Determinations, June 1996, provides the following definition:~~

~~“Transfer capability is the measure of the ability of interconnected electric systems to reliably move or transfer electric power from one area to another area by way of all transmission lines (or paths) between those areas under specified systems conditions. The units of transfer capability are in terms of electric power, generally expressed in megawatts (MW). In this context, area refers to the configuration of generating stations, switching stations, substations, and connecting transmission lines that may define an individual electric system, power pool, control area, sub-region, or region, or portion thereof.”~~

PJM limits energy transfers between PJM RTO and other control areas so that they do not exceed the first contingency total transfer capability between the two areas. ~~The recommended NERC transfer capability measures are “First Contingency Incremental Transfer Capability (FCITC)” and “First Contingency Total Transfer Capability (FGTTC)”.~~

~~“FCITC is the amount of electric power, incremental above normal base power transfers, that can be transferred over the interconnected transmission systems in a reliable manner based on the following conditions:~~

- ~~• Step One: For the existing or planned system configuration, and with normal (pre-contingency) operating procedures in effect, all facility loadings are within normal ratings and all voltages are within normal limits.~~
- ~~• Step Two: The electric systems are capable of absorbing the dynamic power swings, and remaining stable, following a disturbance that results in the loss of any single electric system element, such as a transmission line, transformer, or generating unit, and~~
- ~~• Step Three: After the dynamic power swings subside following a disturbance that results in the loss of any single electric system element as described in (2) above, and after the operation of any automatic operating systems, but before any post-contingency operator-initiated system adjustments are implemented, all transmission facility loadings are within emergency ratings and all voltages are within emergency limits.~~

~~With reference to condition (1) above, in the case where pre-contingency facility loadings reach normal thermal ratings at a transfer level below that at which any first contingency transfer limits are reached, the transfer capability is defined as that transfer level at which such normal ratings are reached. Such a transfer capability is referred to as a Normal Incremental Transfer Capability (NITC).~~

~~FCTTC is the total amount of electric power (net of normal base power transfers plus first contingency incremental transfers) that can be transferred between two areas of the interconnected transmission systems in a reliable manner based on conditions (1), (2) and (3) in the FCITC definition above.~~

~~The preceding NERC principles refer to operating the transmission system against the loss of a single element. PJM operates the electric supply system to protect against the consequences of one bulk power facility malfunction or failure at a time. PJM bases the ATC calculations on a single contingency, which may consist of a number of transmission facilities, depending on system topology.~~

~~PJM quantifies the Available Transfer Capability (ATC) and Total Transfer Capability (TTC) and posts the results on PJM OASIS. Transmission customers use these transmission transfer capability measures to determine the feasibility of transmission service requests.~~

### **Financial Transmission Rights (FTRs)/Auction Revenue Rights (ARRs)**

~~For information on Financial Transmission Rights (FTRs)/Auction Revenue Rights (ARRs) refer to PJM Regional Practices section 1.17 Financial Transmission Rights (FTRs)/Auction Revenue Rights (ARRs) at <http://oasis.pjm.com>~~

~~Whenever PJM receives a request for firm service, all existing uses are modeled based on the assumptions that:~~

- ~~• (1) Existing firm point-to-point users are scheduling energy consistent with their reservations.~~
- ~~• (2) Existing network users are scheduling energy from those network resources, which have been assigned FTRs.~~

~~-(Also See Manual 06, titled Financial Transmission Rights & Auction Revenue Rights.)~~

## ATC Processing

- PJM Tariff Integration Department is responsible for the calculation of ATC/AFC. The calculation of transfer capabilities are based on computer simulations of the operation and response of the interconnected transmission network for a specific set of forecasted operating conditions under four specific time frames:
  - *Hourly* – Hour 1 to Hour 168
  - *Daily* – 1 to 35 days in the future
  - *Weekly* – 1 to 5 weeks in the future
  - *Monthly* – 1 to 18 months in the future

## PJM AFC Process Overview

The process for the PJM AFC/ATC calculation is illustrated in Exhibit 3. The following text describes the inputs, outputs and processes performed within each of the sub-processes contained in Exhibit 3.

The PJM ATC Determination process is a multi-step integrated process consisting of several major components. For more information see the ATCID. An overview of the major facets of this process is described below:

- Seasonal base cases, NERC SDX files, generation dispatch files, generic load profiles, and forecasted load levels are inputs into the ~~PSS/e-m~~ Model builder portion of the ATC Engine. The model builder develops monthly, weekly, daily, and/or hourly base cases, as specified by the operator, from which, in-turn, are inputs into the ~~PTI~~ **MUST based** AFC calculator.

*(Reference NERC standard MOD-001-0)*

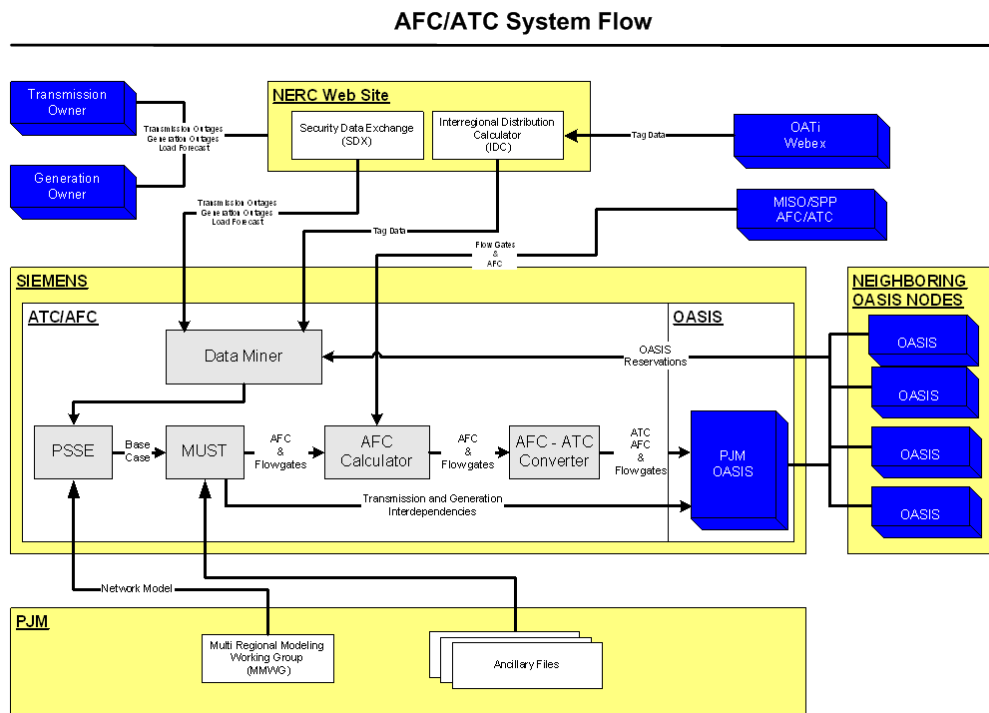
- The ~~PTI~~ **MUST based** AFC Calculator, applies the impacts of transmission reservations (or schedules as appropriate) and calculates the Available Flowgate Capability by determining the capacity remaining on individual flowgates for further transmission service activity. The formula used to determine AFC is contained in the AFC algorithm at : <ftp://ftp.pjm.com/oasis/afc-atc-algorithms.pdf>

~~AFC = Flowgate rating – (base case flow) – (impacts of existing reservations or schedules as appropriate) – TRM – CBM.~~

- The PJM AFC process utilizes the AFC values for selected ~~MISO and~~ **MAPP coordinating entity** flowgates that are calculated by the transmission provider. AFC values for these flowgates calculated overwrite values that the PJM process

determines for these flowgates. In the absence of MISO calculated values, the PJM process uses the PJM generated values to determine AFC values.

- PJM supplies the coordinating entities ~~MISO and MAPP~~ similar values for PJM Flowgates for inclusion in the ~~ir~~ MISO-AFC process.
- Using transfer response factors for specific POR/POD pairs, the AFC – ATC Converter translates the flowgate AFC values into ATC values for posting to the OASIS.
- Values provided to the OASIS from the PJM AFC/ATC process are continuously updated on the OASIS to reflect the reservations that were accepted between the calculation cycle.



Document ID # 193843  
Document Name: AFC/ATC System Flow

Exhibit 3: AFC/ATC System Flow

(Reference NERC standard MOD-001-01 and MOD-030-02)

## ATC Calculation

### Base Case Preparation

PJM develops and maintains seasonal models for the next 18 months. These seasonal models are developed from the NERC MMWG case library.

PJM AFC/ATC calculations are based on these seasonal models. The model builder portion of the PJM AFC/ATC engine modifies these seasonal base cases to reflect anticipated conditions such as load levels, outages, and base transfers for the AFC/ATC time horizon. Base case models are used to develop the following: for monthly (18 monthly models); weekly (5 weekly models); daily (35 days); and hourly (next 168 hours) time frames. Systems outside PJM are retained with seasonal case level of detail at a minimum.

### Analysis

(Reference NERC standard MOD-001-01)

~~Flow based analysis is used to determine and update flowgate loadings for reservations not modeled in the base case and to determine response factors on each flowgate. Flowgate loadings and response factors are used to determine the individual path ATC values. For more information on the Analysis see the ATCID.~~

~~PJM will recognize physical network limitations (i.e. flowgates) on PJM and non-PJM systems in the determination of the path TTC/ATC values. Contract path limits between PJM systems and neighboring systems are recognized.~~

~~Response factors on flowgates are determined by the PJM AFC calculation engine, an enhanced version of the PTI MUST (Managing and Utilizing System Transmission) software as the basic calculation tool to determine AFC values and distribution factors.~~

~~Transmission reservations are netted for purposes of TTC and ATC determination.~~

~~Counterflow rules are utilized for netting purposes as follows:~~

- ~~— Impact of Firm Reservations on Firm ATC in Same (positive) Direction~~
- ~~— Impact of Firm Reservations on Firm ATC in Opposite (counterflow) Direction~~
- ~~— Impact of Firm Reservations on Non Firm ATC in Same (positive) Direction~~
- ~~— Impact of Firm Reservations on Non Firm ATC in Opposite (counterflow) Direction~~
- ~~— Impact of Non Firm Reservations on Non Firm ATC in Same (positive) Direction~~
- ~~— Impact of Non Firm Reservations on Non Firm ATC in Opposite (counterflow) Direction~~

~~The specific percentage of counterflow used may vary between flowgates.~~

## PJM OASIS

The current transmission paths can be viewed on the OASIS (<http://www.pjm.com/etools/oasis.html>), or in the Regional Practices document.

### Posted Paths

~~PJM posts ATC and TTC information on the PJM OASIS. Refer to the [Regional Practices section 1.1 Transmission Service Request Paths OASIS User Manual](#) for details. The ATC and TTC of a posted path represent the values for the next scheduled transaction along that path independent of any other simultaneous transfer.~~

~~When Network Import Service is requested, the POD is PJM and the POR is designated by the customer based on the contracted point of receipt. Network service decrements the appropriate point to point path postings.~~

~~Information is posted for any valid PJM contract path “for which transmission service was denied, curtailed, or subject to interruption during any hour for a total of 24 hours in the last 12 months”.~~

### OASIS Service Types- OASIS Decrementing

The following types of service are offered on the PJM OASIS: Firm, Non-Firm, Non-Firm On-Peak, Non-Firm Off-Peak, Network, Network On-Peak, and Network Off-Peak.

Decrementing occurs between related capacity types and transmission paths. The following serve as a summary of decrementing when transmission service requests are accepted:

- Firm service decrements itself, Network, and all Non-Firm service types.
- Non-Firm decrements itself.
- Network service decrements all Network, Firm, and all appropriate Point-to-Point Non-Firm service types.
- Network (non-designated, which includes Spot Imports) On-Peak decrements itself, Non-Firm, and Non-Firm On-Peak.
- Network (non-designated, which includes Spot Imports) Off-Peak decrements itself and Non-Firm Off-Peak.

### Calculation Frequency for all Paths on OASIS

AFC and ATC values are recalculated hourly by the AFC/ATC engine for;

- The next 168 hours
- The next 35 days.
- The next 5 weeks.
- The next 18 months

For more information on the Analysis see the ATCID. The most recent TTC/ATC values determined by the AFC-ATC converter for each path are posted on the OASIS.

### Transmission Margins

*(Reference NERC standard MOD-004008-02)*

- ~~To ensure the integrity of the transmission system, Capacity Benefit Margin (CBM) and Transmission Reliability Margins (TRM) are applied to determine available ATC. As described earlier, the uncertainty of ATC projections increase for longer term projections due to the greater difficulty in being able to predict the various system assumptions and parameters over these time periods. Similarly, future transactions are inherently uncertain and can have significant impacts on transmission loading. Therefore, the amount of TRM required is time dependent with generally a larger amount necessary for longer-term projections than for near-term conditions. Margins are applied differently depending on the time frame and interface/path direction of the analysis. Additionally, some margins are applied only to determine Firm ATC, since Non-Firm transactions can be curtailed. All margin values that are preserved for Firm use are made available on a Non-Firm basis. For more information on the Transmission Margin see the TRMID. The TRMID and ATCID are included on the PJM OASIS page under ATC Information. (Reference NERC standard MOD-008-0)~~

### Capacity Benefit Margin

*(Reference NERC standard MOD-006004-02)*

~~For information on CBM see the Capacity Benefit Margin (CBMID) and Available Transfer Capability Implementation Document (ATCID). The CBMID and ATCID are included on the PJM OASIS page under ATC Information. Through the sharing of installed generating capacity via transmission interconnections, systems have relied on transmission import capability to reduce their required installed generating capacity necessary to provide reliable service to native load customers. In order to ensure that PJM has the ability to import external generation for the purpose of serving native load, a portion of the transfer capability will be set aside. This capability, known as the Capacity Benefit Margin, is a reflection of the mutual benefit of interconnected operations and reservation of this margin allows a system to reduce its installed generating capacity below that which may have otherwise been required if transmission interconnections did not exist.~~

~~CBM is only applied to Firm ATC interface/path calculations where PJM is the sink. CBM is not applied to Non-Firm ATC interface/path calculations and is made available as Non-Firm transmission service.~~

### **Use of CBM**

*(Reference NERC standard MOD-006-0)*

~~For information on CBM see the Capacity Benefit Margin (CBMID) and Available Transfer Capability Implementation Document (ATCID). The CBMID and ATCID are included on the PJM OASIS page under ATC Information. PJM's procedure on the use of Capacity Benefit Margin (CBM) or scheduling of energy against a CBM preservation is explained in the following three components:~~

- ~~— CBM shall be used only after the following steps have been taken (as time permits): all non-firm sales have been terminated, Direct-Control Load Management has been implemented, and customer interruptible demands have been interrupted. CBM may be used to reestablish Operating Reserves.~~
- ~~— CBM shall only be used if PJM (on behalf of the Load-Serving Entity) PJM is experiencing a generation deficiency (Maximum Generation Emergency Event) and PJM (the Transmission Service Provider) is also experiencing Transmission Constraints relative to imports of energy on its transmission system. PJM shall use CBM to exercise Emergency Energy Agreements and to implement approved emergency energy bids. PJM does not displace Non-Firm imports until the system is constrained. If constrained, CBM (which is firm services) displaces Non-Firm imports to provide more reliable service to load in Emergency Operations.~~
- ~~— CBM is always made available as Non-Firm Transmission Service in PJM's AFC/ATC calculations.~~

### **Documentation of CBM**

*(Reference NERC standard MOD-007-0)*

The uses of CBM shall be reported (to the Regional Reliability Organization, NERC and the transmission users) by PJM on its system by posted notice on the PJM OASIS, except for CBM sales as Non-Firm Transmission Service. (This use of CBM shall be consistent with the PJM's procedure for use of CBM described above in the CBMID.)

PJM (the Transmission Service Provider) shall post the following three items within 15 calendar days after the use of CBM for an Energy Emergency. This posting shall be on a web site accessible by the Regional Reliability Organizations, NERC, and transmission users.

- Circumstances.
- Duration.
- Amount of CBM used, which determined as the amount amount of non-firm import service curtailed to provide for emergency energy imports (which are firm and increase reliable operations under emergency conditions).

### Transmission Reliability Margin

(Reference NERC standard MOD-008-01)

The inherent uncertainties in the projected system conditions used to calculate Total Transfer Capability and Available Transfer Capability can result in unreliable transmission system operations. In order to ensure the secure operation of the interconnected transmission network under a broad range of potential system conditions, a portion of Transmission Transfer Capability will be set aside. This capability, known as the Transmission Reliability Margin (TRM), will provide the needed operating flexibility to ensure reliable system operations and minimize the need to curtail transmission service for system reliability control. Additional information on TRM is available in the Transmission Reliability Margin (TRMID) and Available Transfer Capability Implementation Document (ATCID). The TRMID and ATCID are included on the PJM OASIS page under ATC Information.

### Incorporating Margins

(Reference NERC standard MOD-008-0)

Calculating the Total Transfer Capability (TTC) for a given path is described below.

CBM, TRM and TTC are determined as follows:

$$CBM_{AB} = FG_{CBM}/DF_{AB} \text{ or Cap Path } CBM_{AB} \text{ value}$$

$$TRM_{AB} = FG_{TRM}/DF_{AB}$$

$$TTC_{AB} = ATC_{AB} + ResV_{Only A to B} \text{ (not net of reservations, includes all reservations used to calculate the path ATC)} + CBM_{AB} + TRM_{AB} \text{ or Cap Path } TTC_{AB}$$

TTC will be based on the Non-Firm calculation and then be used for the Firm and Non-Firm TTC posting.

### Regional Coordination

(Reference NERC standard MOD-004-0)

PJM recognizes the importance of Regional Coordination and its impact on transfer capability. Tools such as NPCC Inter-Control Area Communications, Inter-Utility Data Exchange Consortium (IDEC) Communications, the NERC System Data Exchange (SDX), and the Security Coordinator Information System (SCIS) are used to exchange data between control areas. Procedures, such as the Operating Representatives of Northeast

~~Systems (ORNS) Communication Network Operating Procedure, the Lake Erie Circulation Process, and the NERC Transmission Loading Relief Procedures described in Manual 37 Reliability Coordination~~ are in place to assure the reliability of the bulk interconnected power transmission system and the proper exchange of operating data. All actual and planned transmission and generation outages are described through the SDX, ~~IDEC~~, ~~SCLS~~, and PJM OASIS at <http://oasis.pjm.com/doc/linesout.txt>. PJM OASIS also provides all transmission service request information and PJM path postings. The **Interregional Transmission System Reliability Assessment** studies provide a longer-range forum for system capability, limiting facilities and contingencies.

The detailed regional coordination and exchange of operations data allows each neighboring system to accurately calculate their ATC, reflecting the impact of external conditions on their ATC analysis.

Since PJM cannot perform ATC analyses on systems external to PJM, the transmission customers must review each transmission providers OASIS to determine what can feasibly be transferred from generation to load across the transmission system. The transmission customer must contract with all applicable control areas along the desired contract path to determine the availability of ATC and to request transmission service that involves control areas in addition to PJM.

## Section 3: Initial Study For Long Term Firm Transmission Service Request Evaluation Process

Welcome to the Initial Study For Long Term Firm Transmission Service Request (~~LTFTSR~~) Evaluation Process section of the *PJM Manual for Transmission Service Request*.

### ~~Long Term/Network Service Request Evaluation~~

~~ECAR, MAAGNERC, RFC-, SERC~~ and ~~SERC MAIN~~ reliability standards require that installation of generation and transmission be coordinated to achieve regional reliability requirements. PJM evaluates requests for Long Term Firm ~~point to point~~ Transmission Service using deliverability tests commensurate with those employed for evaluating generation interconnection requests. The FERC comparability standard is applied in evaluating the impact of all requests. PJM studies Long Term Firm Transmission Service Requests for unlimited rollover rights beyond the requested end date unless otherwise instructed by the customer.

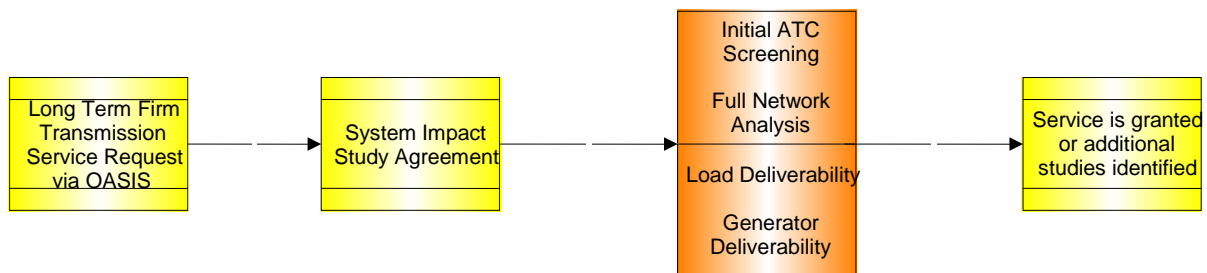


Exhibit 4: Long Term Firm Transmission Service Request Process

The PJM ~~Long Term Firm Initial Study process evaluation process~~ is composed of four major parts:

1. ~~The Initial~~ ATC Screening
2. ASTFC Screening
3. Full Network Analysis
4. Load Deliverability
5. Generator Deliverability

These parts determine a centralized calculation for the entire PJM footprint. The five steps encompass the multitude of assumptions and projections of expected internal and external conditions, such as system topology, generation dispatch, projected customer

demands, as well as existing and future transactions. Transfer capability can vary significantly with changing system conditions. Modeled conditions are much more susceptible to change as the operating and planning horizons increase. For this reason, and to guard against unreliable system operations resulting from over-allocating the transmission system, different assumptions are incorporated in the various component tests used for the evaluation of long term firm transmission service. Failure of any portion of the process results in a rejection of the request. The process progresses according to an increasing level of both granularity and the breadth of system conditions in order to model future capability issues using both a deterministic and probabilistic approach.

### Initial ATC Screening

Once a long-term transmission request has been made and the Initial Study Agreement (ISA) has been executed, evaluation of that request begins with an ATC screening. The initial ATC screening test (if within ATC calculation horizon) indicates if sufficient transmission capability exists for the requested service. ~~using a fixed set of flowgates.~~ The following are used in the ATC screening:

- Power flow models
- ~~The A fixed set of flowgates are selected to reflect all known constraints (or choke points). Since only the flowgates are being considered, studies can be completed faster than performing a full network analysis at this stage.~~
- ~~The test passes if the magnitude of the transmission service request is less than or equal to the current firm ATC for the corresponding transmission service period(s) and specific Point(s) of Delivery (POD) and Point(s) of Receipt (POR) specified in the transmission service request.~~
- ~~The ATC screening process takes into account firm transmission service granted on coordinated Oasis', however, only takes into account Long term firm service on the PJM Oasis. Existing reservations and previous queues under STUDY status~~
- ~~The test also models grandfathered service as well.~~
- ~~The process takes into account predicted load, transmission and generation outages for the time period studied, as provided through NERC SDX data.~~
- ~~In addition, the study includes Capacity Benefit Margin (CBM) and Transmission Reliability Margin (TRM) on flowgate basis (usually about 5%) for each flowgate to maintain the reliability of the system.~~
- ~~The screening begins by building a model for each month of the term of service, modeling all system conditions as per the SDX and other data inputs.~~
- ~~The AFC calculator uses the flowgate rating as a starting point, and decrements the flowgates according to base case flow and all reservations that are modeled in the study which determines the new available flowgate capability.~~
- ~~TRM and CBM are then decremented from the flowgate capability.~~
- ~~Response factors are calculated and used to convert the AFC values to ATC values. These values are then compared to the direction and amount of the request.~~

The ATC screening begins by building a power flow model for each month of the term of service, modeling all system conditions as per the SDX data, reservations and other inputs.

The AFC calculator uses the power flow model as a starting point, calculates the distribution factors for each flowgate with respect to the transmission paths then decrements the flowgate capacity according to base case flow in the model. The ATC calculator then determines the new AFC values by taking into account CBM, TRM and reservation impact of each flowgate. The calculated AFC values are then converted to ATC values and compared against the requested amount.

~~Failure of any time period of the request results in failure of the request. Once the ATC screening has been passed a full network analysis must be completed.~~

### Full Network Analysis

If the request passes the initial screening, then a Full Network Analysis begins. The full network analysis is a flow-based analysis that monitors all transmission facilities for all valid contingencies. This analysis allows a more thorough view of the system conditions and points out problems which may not appear on a flowgate based analysis.

The full network analysis uses the case created for each month of the ATC screening test as a starting point.

This includes all system conditions and reservations modeled in the previous step.

The analysis uses PTI MUST to determine the limits on ATC using a full monitored element list and full contingent element list.

A limit on the ATC value is only valid if it has a 5% or greater impact on the direction being studied.

Once valid limits have been established for the directions in question the amount of the request is compared to the amount of ATC remaining and if the ATC value is greater than or equal to the request then it is passed for that month.

~~If all months pass the request, then it moves to the load deliverability section.~~

### ASTFC Screening

The ASTFC screening, if within the calculation horizon, will identify potential flowgates allocation violations to comply with the PJM-Midwest ISO-TVA Baseline Congestion Management Process Agreement. The agreement can be found at <http://www.pjm.com/documents/agreements/~/media/documents/agreements/joint-reliability-coordination-agreement-miso-pjm-tva.ashx>.

### Load Deliverability

PJM determines the Control Area Capacity requirement to achieve reliability objectives assuming sufficient network transfer capability will exist. The energy from generating facilities or the energy delivered using Long Term Firm Point-to-Point Transmission Service that is ultimately committed to meet resource requirements must be deliverable to wherever it is needed in an emergency. Therefore, there must be sufficient transmission network transfer capability within the control area. PJM will determine the sufficiency of network transfer capability through a series of deliverability tests. All generator interconnections, Long Term Firm Point-to-Point and Network Transmission Service in PJM will be subjected to the same deliverability tests.

Once the request has passed the ATC screening and full network analysis, the load deliverability section of the process begins. Long-Term Firm Point-to-Point Transmission Service must be deliverable to serve load in all sub-regions of PJM during any system conditions, including system emergencies and capacity deficiencies as if it were a generator within the PJM system. Using stated assumptions from the reliability assessments such as the stated Capacity Emergency Transfer Objective (CETO) for PJM, the load deliverability test determines whether the addition of the request would hinder reliable operation with full usage of the CETO, which is also known as PJM's Capacity Benefit Margin (CBM) for its tie lines. CETO is equivalent to the amount of energy delivered from the ties, required to ensure a one day in ten year loss of load event standard.

This would represent the ability of the PJM system to ensure reliable operation even during system emergencies. In order to accurately model every sub-region and all possible contingencies PJM employs a full-network solution with a complete monitored element and contingent element list. PJM models the usage of the full CETO as a set of interchange transactions from its neighbor systems, which represents the actual use of the system ties as a source of generation during an emergency. These transactions are added on to all transactions modeled in the previous two steps. The deliverability test assumes a 90/10 probability load estimate (as opposed to a 50% load probability estimate used in previous ATC screening steps) and to model this, scales the PJM load to 105% of that in the previous tests. PJM applies the same solution and passing criteria for the full network solution in step two and models each month of the service request. If each month passes, the request moves on to the Generator Deliverability test, if any month fails, the request is denied.

### Generator Deliverability

Point-to-Point service is coincident with the Generator Interconnection process, where PJM requires the demonstration of deliverability, to ensure that the new generation resource can be certified as an installed capacity resource with respect to the PJM installed capacity obligations.

[The Generator Deliverability analysis process is described in the PJM Manual 14B PJM Region Transmission Planning Process Attachment C: PJM Deliverability Testing Methods available on the PJM website included with PJM Manuals.](http://www.pjm.com/documents/manuals.aspx)

<http://www.pjm.com/documents/manuals.aspx>

~~To maintain reliability in a competitive capacity market, resources must contribute to the deliverability of the Control Area in two ways:~~

- ~~— Energy must be deliverable, from the aggregate of resources available to the Control Area, to load in portions of the Control Area experiencing a localized capacity emergency, or deficiency. PJM utilizes the CETO/ CETL procedure to study this deliverability of load.~~
- ~~— Capacity resources within a given electrical area must, in aggregate, be able to be exported to the remainder of the Control Area, which is experiencing a capacity emergency. PJM utilizes a Generator Deliverability procedure to study the~~

~~deliverability of individual generation resources. This document provides the procedure for Generator Deliverability.~~

~~The goal of the PJM Generator Deliverability study is to determine if the aggregate of generators in a given Region can be reliably transferred to the remainder of PJM. Any generators requesting interconnection to PJM must be deliverable in order to be a PJM installed capacity resource.~~

~~The purpose of subjecting the requested Long Term Firm Transmission Service to this test is to verify that the service can co-exist with generators whose interconnection request predates the transmission service request.~~

~~If the transmission service can not co-exist with a planned generator whose interconnection request predates the transmission service request, and the original transmission service request does not conflict with the generator in service date, the request will be approved. However, the transmission customer will be notified that they have no automatic roll over rights. If the customer requests to renew the transmission service, another system impact study will be conducted.~~

~~The generator delivery deliverability test consists of four parts as described below.~~

~~**Step 1:** Each generator in PJM with certified capacity rights is initially modeled at 90% of installed capacity. All new generation applicants are set at 0 MW but available to be turned on **before** the unit under study. Then the first few units in queue are turned on at 90% capacity until the net PJM interchange equals the firm interchange target. Generation applicants **after** the queue position under study are not modeled in the analysis.~~

~~For example, to study unit B75, you would turn all existing PJM certified capacity and the first few units in queue A to 90%, until you meet the net firm interchange target. The rest of queue A and units B1–B74 would be set to 0 MW but available to be turned on for study. Generation applicants after queue position B75 are not modeled.~~

~~**Step 2:** The PJM transmission system is essentially analyzed facility by facility to determine if normal or contingency overloads can occur. For each analyzed facility, an electrical circle is drawn which includes all units that have 5% or greater distribution factor on the facility being analyzed. (A 10% distribution factor is used for 765kv and 500kv facilities.) Then a load flow simulation is performed using a DC simulation which studies various combinations of generator outputs within the 5% DFAX circle. Each unit in the 5% circle is modeled operating between 90% and 100% of its installed capacity (0% to 100% for generation applicants), and proportionately displacing all other generation, both inside and outside the 5% circle, to maintain a constant net PJM interchange with the rest of the world. Any, several, or all the units within the 5% circle can be set at 100% output.~~

~~**Step 3:** For any identified overloads, the distribution factor of ALL generators on the facility is determined (includes units with certified capacity rights and also units which have requested capacity in the PJM Generation Interconnection Request Queues). Generators are sorted in a list from highest ‘positive’ distribution factor to least, through zero, and then continuing through the units with a ‘negative’ distribution factor (units which counter flow the~~

overload), so that the last unit in the list has the greatest counter flow or negative DFAX on the overloaded facility. Steps 1-3 are performed twice: once with the unit under study turned on at its full requested capacity value, and again with the unit turned off. If the unit had a beneficial effect or had no effect on an overload, then the unit is relieved of culpability for that particular overload. If the unit under study increased the severity of an overload, then the unit's impact on the overloaded facility is 'tagged' for further study.

**Step 4:** For each facility that the unit under study overloaded or contributed to an overload, the DFAX list is analyzed, and essentially split into two lists. The first list includes all generators (certified units and generation applicants) with greater than 5% DFAX on the overloaded facility, sorted in order of descending DFAX. (10% minimum DFAX if the overload is on a 765kv and 500 kV facility) The units with the highest DFAX are sequentially turned on at full capacity until the expected availability of the selected units is as close to but not less than 20%. This is the same as the method used in queue A. Units with certified capacity rights and also units with queue positions ahead of the unit under study are turned on in the 80/20 list. All remaining certified capacity in PJM is proportionately displaced to maintain the firm net interchange. Generation applicants that don't make the 80/20 list remain off.

The second DFAX list includes all remaining queued generators which did not get turned on at 100% in the first DFAX list and that have either greater than a 5% DFAX on the facility or a maximum output which when multiplied by the unit's DFAX is greater than 5% of the line's rating. The cumulative effect of these units can sometimes have a significant impact on the results of a deliverability study. However, turning these units on will typically create too much localized generation, and a localized capacity emergency condition elsewhere when the rest of PJM is proportionally displaced to maintain the net firm interchange. Therefore, to account for the effect of these units on the facility in question, the facility loading is adjusted by an adder,

**Facility Loading Adder =  $-\sum(\text{Requested Capacity} * \text{DFAX} * 0.85)$**

This Facility Loading Adder will account for the effect of other generator applicants *without actually turning them on*. If the sum net effect of the generation applicants before the queue position under study has a beneficial effect on the overloaded facility, then the loading of the overloaded facility will be decreased to account for this beneficial effect. Similarly, the facility loading will be increased if generators before the queue position under study will further add to the overload. In short, the 80/20 DFAX list will define the study area *for this particular overloaded facility* by determining which units to turn up to 100% of capacity. All remaining units with PJM certified capacity rights are proportionally displaced to some level below 90% output, to maintain the firm PJM interchange. All generator applicants before the queue position under study are turned off, but are accounted for by increasing or decreasing the loading of the overloaded facility, depending on whether the net effect of those units on the overload is beneficial or detrimental.

Failure results in any of the screenings will result in a need to complete a System Impact Study (SIS) before service can be accommodated. The PJM SIS process can be found at <http://www.pjm.com/~media/documents/manuals/m14a.ashx>.

## Revision History

### ***Revision 11 (November 15, 2010)***

- Section 1: Updated for changes required by NERC MOD standard changes. Remove duplication of OASIS information already contained in the Regional Practices.
- Section 2: Updated for changes required by NERC MOD standard changes.
- Section 3: Updated for changes in Long term Firm Evaluation Process and Deliverability process is described in detail in Manual 14B.
- Updated various hyperlinks to OASIS website due to change in domain

### ***Revision 10 (May 15, 2007)***

- Section 1: Updated timing requirements as per OATT 3/1/2007.
- Updated various hyperlinks to OASIS website due to change in domain
- Updated timing requirements as per new Tariff.
- Updated links to new OASIS website.
- 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.
- Listed references to NERC MOD requirements. RFC and SERC regulatory standards reflect the NERC requirements of MOD-000 through MOD-008, therefore references to requirements in this manual will show the NERC standard

### ***Revision 09 (05/12/06)***

Section 1: Transmission Service Request Process

Updated “PJM Network Import Transmission Service Requests” to include Spot Import service.

Section 2: Available Transfer Capability Calculations

Updated “OASIS Service Types- OASIS Decrementing” to include Spot Import service.

Updated Exhibit 1: List of PJM Manuals.

Revisions were made to the following pages: 5, 16 and 24.

### ***Revision 08 (04/14/05)***

Updated Exhibit 1 to include new PJM Manuals.

Section 1: Transmission Service Request Process

Revised the Application Information

Changed references of System Planning to Transmission Department

Section 2: Available Transfer Capability Calculations

Combined the AFC/ATC Principles and AFC/ATC Philosophy Sections

Replaced Model Preparation Section with ATC Calculation Section

Section 3: Long Term Firm Transmission Service Request Evaluation Process

Renamed Section 3 (from System Impact Study)

All of Section 3 was extensively rewritten

**Revision 07 (12/01/03)**

Section 1: Transmission Service Request Process

Changed "Member Services Department" to "Member Relations Department"

Revised the Applying for Authorization steps

Revised the Written Requests for Long-Term Firm Point-to-Point Service steps

Revised the Short-Term Firm Transmission Service Requests description

Section 2: Available Transfer Capability Calculations

Revised ATC Processing to reflect new calculation algorithms.

Revised Transmission Margin to reflect changes to Capacity Benefit Margin and Transmission Reserve Margin

Section 3: System Impact Study

Added detail for Monthly and Yearly requests

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

Section 02: Available Transfer Capability Calculations

Additional detail and clarification to Regional Coordination section of PJM ATC Philosophy.

Clarification that PJM does not net transactions of opposite direction on a path in the ATC Processing section.

Addition of detail in the Mid-Term ATC and Long-Term ATC sections. Interruptible loads are considered in service for ATC calculations, and that only Long-term Capacity Backed transactions are modeled explicitly in the base cases.

Expanded detail for CBM development in the Capacity Benefit Margin section.

Identified that TRM values are reviewed annually in the Transmission Reliability Margin section.

Added a section identified as PJM Methodology and ATC Complaint Forum.

Removed Attachment A: Definitions & Abbreviations. Attachment A is being developed into PJM Manual for ***Definitions & Abbreviations (M-35)***.

***Revision 05 (06/02/99)***

Section 01: Transmission Service Request Process

Added section to discuss Transmission Loading Relief (TLR) and day-Secondary products.

Revised "Earliest Request," "Latest Request," "Provider Response" and "Customer Confirmation" times for Short-Term Firm and Non-Firm Transmission Service Requests.  
Updated short-term service section to reflect recent policy changes.

***Revision 04 (10/09/98)***

Section 02: Available Transfer Capability Calculations

Revised Calculated Paths in "PJM ATC Overview" to reflect wide area "PJM to West" calculation.

Revised list of Into PJM paths for which ATC and TTC information is posted on OASIS in "Posted Paths" under "OASIS."

Revised Network Import names under "Posted Paths" under "OASIS."

Added additional text to "Regional Coordination" under "PJM ATC Philosophy."

Revised discussion of "PJM Western Interface" calculations under "PJM ATC Philosophy" to further define PJM Western Interface calculations.

***Revision 03 (06/17/98)***

Section 01: Transmission Service Request Process

Revised "Earliest Request," "Latest Request," "Provider Response" and "Customer Conformation" times for Short-Term Firm and Non-Firm Transmission Service Requests.

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

Section 2: Available Transfer Capability Calculations

Section 2 was extensively rewritten. Changes were too extensive to enumerate in this Revision History. The previous Section 2 is available upon request from PJM Customer Relations & Training Department.

***Revision 01 (06/30/97)***

Section 1: Transmission Service Request Process

Removed "willingness to pay congestion rent" under "Short-Term non-Firm Transmission Service Requests."

Revised Exhibit 1.2 changing reference to "Approved" to "Accepted" and "Denied" to "Refused."

Section 2: Available Transfer Capability Calculations

Added "... each posted path have been determined. As a final check of system reliability, an operations reliability review is conducted to assess the impact of the calculated Long Term Firm ATC values on PJM RTO security. Exhibit 2.1 illustrates ..." under "ATC Processing."

Revised Exhibit 2.1 to include process block "Assess Impact of Long Term ATC values on PJM Control Area Security."

Added section (h) "Long Term Firm ATC values are reviewed and subjected to an operations reliability review. This review assesses the impact of the calculated Long Term Firm ATC values on PJM Control Area security." under "Long-Term ATC."

**Revision 00 (04/30/97)**

Changed references to PJM Interconnection Association to PJM Interconnection, L.L.C.

Changed references to PJM to PJM OI where appropriate.

Changed references to PJM to PJM Control Area where appropriate.

Changed references to PJM IA to PJM OI.

Changed references to IA to PJM OI.

Changed references to Mid-Atlantic Market to PJM Interchange Energy Market.

Changed references to Mid-Atlantic Market Operations Agreement to Operating Agreement of PJM Interconnection, L.L.C.

Changed references to pool to control area.

Changed references to parties to PJM Members.

**Revision 00 (03/24/97)**

This revision is a draft of PJM Manual for **Transmission Service Request**.