PJM Manual 2:

Transmission Service Request

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Effective Date: April 1, 2011

Prepared by

Tariff Integration

Transmission Service Request

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Approval

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Current History

Revision 11 (approved November 18, 2010, effective April 1, 2011):

- Section 1: Updated for changes required by NERC MOD standard changes. Remove duplication of OASIS information already contained in the Regional Practices. Added PJM ATC Methodology Contact.
- 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 PJM and OASIS website due to changes in domain.

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

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 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 User Guide http://www.pjm.com/markets-and-operations/etools/oasis/oasis-user-guide.aspx
- PJM OASIS 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
- 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
- Transmission Reliability Margin Implementation Document (TRMID) 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*").

1.1 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.

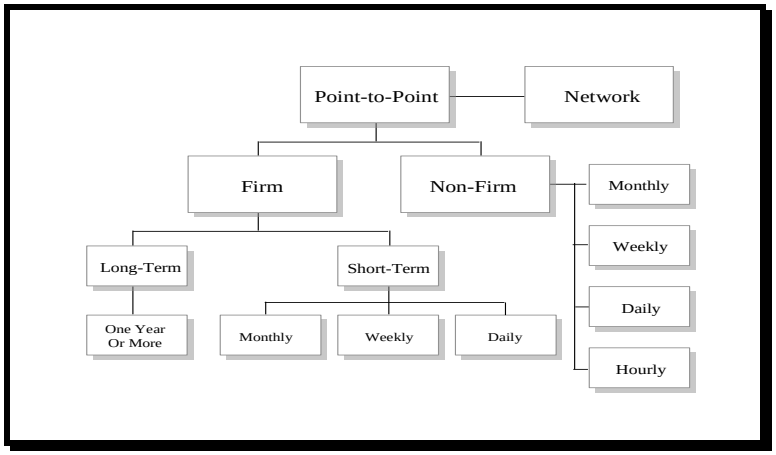

Exhibit 1: PJM Transmission Services

1.1.1 Point-To-Point Transmission Service

Point-to-Point Transmission 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

1.1.2 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.

1.2 Applying for Authorization

To become an eligible transmission service customer, a Transmission Service 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 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.

1.3 Point-to-Point Transmission Service Requests

(Reference NERC standard MOD-001-1)

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/markets-and-operations/etools/oasis/oasis-user-guide.aspx). In addition, a written application must be submitted to PJM for long-term firm requests.

1.3.1 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). The steps for the OASIS transmission service request are depicted on Exhibit 2.

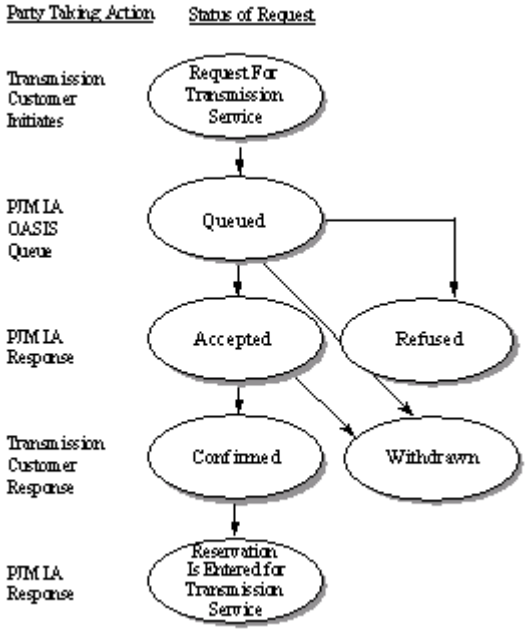

Exhibit 2: Purchasing Transmission Service Using OASIS

1.3.2 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."

1.3.3 Short-Term Firm Transmission Service Requests

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.

1.3.4 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.

1.3.5 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

1.3.6 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.

1.4 Network Service Requests

Refer to PJM Regional Practices section 1.5 PJM NETWORK Transmission Service Requests at http://oasis.pjm.com for information.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.

1.5 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.

1.5.1 PJM Methodology Contact and ATC Complaint Forum

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 Member Services on the 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.

There is also a PJM ATC Methodology Contact document at: ftp://ftp.pjm.com/oasis/ATC-Methodology-Contact.pdf

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*").

2.1 PJM ATC Overview

(Reference NERC standard MOD-001-1)

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.
- 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 processes are used to calculate ATC:
  - Model builder (monthly, weekly, daily, and/or hourly base cases
  - AFC Calculator (calculates Available Flowgate Capability)
  - AFC-ATC Converter (translates AFC values to ATC values)
- Frequency of Calculation: *(Reference NERC standard MOD-001-1 R8)*
  - The ATC values for all time frames are automatically recalculated hourly.

- Calculated Paths:
  - Refer to the OASIS Regional Practice section 1.1 for details on 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.

2.2 PJM AFC/ATC Principles and Philosophy

(Reference NERC standard MOD-001-1 and MOD-030-2)

PJM procedures for determining Available Transfer Capabilities (ATC) follow the North American Electric Reliability Council's (NERC) 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 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.

2.2.1 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

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

2.3 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

2.3.1 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 model builder portion of the AFC/ATC Calculation. 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 AFC calculator.

  (Reference NERC standard MOD-001-0)

- The 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
- The PJM AFC calculation utilizes the AFC values for selected 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 coordinating entity calculated values, the PJM AFC calculation uses the PJM generated values to determine AFC values.
- PJM supplies the coordinating entities similar values for PJM Flowgates for inclusion in their AFC calculation process.
- Using transfer response or distribution 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 Converter are continuously updated on the OASIS to reflect the reservations that were accepted between the calculation cycles.

AFC/ATC Process Flow Diagram

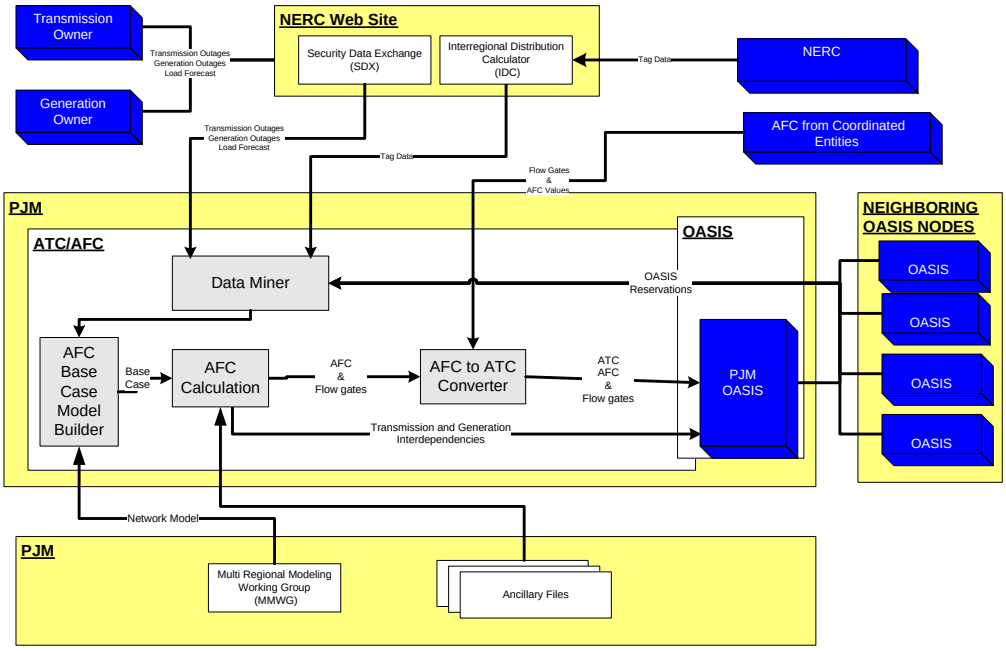

Exhibit 3: AFC/ATC System Flow

(Reference NERC standard MOD-001-1 and MOD-030-2)

2.3.2 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 Converter 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.

2.3.3 Analysis

(Reference NERC standard MOD-001-1)

For information see the Available Transfer Capability Implementation Document (ATCID). The ATCID is included on the PJM OASIS page (http://oasis.pjm.com) under ATC Information.

2.4 PJM OASIS

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

2.4.1 Posted Paths

PJM posts ATC and TTC information on the PJM OASIS. Refer to the Regional Practices section 1.1 Transmission Service Request Paths

2.4.2 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.

2.4.3 Calculation Frequency for all Paths on OASIS

AFC and ATC values are recalculated hourly by the AFC-ATC Converter for;

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

For information see the Available Transfer Capability Implementation Document (ATCID). The ATCID is included on the PJM OASIS page (http://oasis.pjm.com) under ATC Information. The most recent TTC/ATC values determined by the AFC-ATC Converter for each path are posted on the PJM OASIS.

2.5 Transmission Margins

(Reference NERC standard MOD-004-1 and MOD-008-1)

For more information on the Transmission Margins see the CBMID, TRMID, and ATCID included on the PJM OASIS page (http://oasis.pjm.com) under ATC Information.

2.5.1 Capacity Benefit Margin

(Reference NERC standard MOD-004-1)

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 (http://oasis.pjm.com) under ATC Information.

2.5.2 Use of CBM

(Reference NERC standard MOD-004-1)

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 (http://oasis.pjm.com) under ATC Information.

2.5.3 Documentation of CBM

(Reference NERC standard MOD-004-1)

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 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 of non-firm import service curtailed to provide for emergency energy imports (which are firm and increase reliable operations under emergency conditions)

2.5.4 Transmission Reliability Margin

(Reference NERC standard MOD-008-1)

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 (http://oasis.pjm.com) under ATC Information.

2.5.5 Incorporating Margins

(Reference NERC standard MOD-008-1)

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

CBM, TRM and TTC are determined as follows:

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

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

$TTC_{AB} = ATC_{AB} + Resv_{Only\ A\ to\ B}$ *(not net of reservations, includes all reservations used to calculate the path ATC)* $+CBM_{AB} + TRM_{AB}$ *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.

2.5.6 Regional Coordination

(Reference NERC standard MOD-004-1)

PJM recognizes the importance of Regional Coordination and its impact on transfer capability. Tools 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, 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 Evaluation Process section of the ***PJM Manual for*** **Transmission Service Request**.

NERC, RFC, and SERC reliability standards require that installation of generation and transmission be coordinated to achieve regional reliability requirements. PJM evaluates requests for Long Term Firm 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.

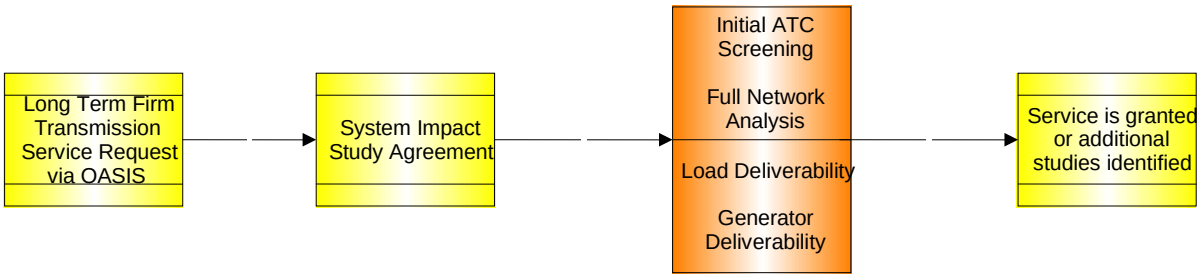

Exhibit 4: Long Term Firm Transmission Service Request Process

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

(1) 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.

3.1 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 ATC screening (if within ATC calculation horizon) indicates if sufficient transmission capability exists for the requested service. The following are used in the ATC screening:
Power flow models

- A fixed set of flowgates
- Existing reservations and previous queues under STUDY status
- NERC SDX data
- CBM and TRM on a flowgate basis

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 AFC 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.

3.2 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 software 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.

3.3 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.

3.4 Load Deliverability

The Load 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 .

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.

3.5 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

Failure results in any of the screenings will resulted 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 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.***