



PJM RTEP – 2014/15 RTEP Long Term Proposal Window Problem Statement & Requirements Document

PJM Interconnection

Original Document: October 30, 2014

Version 2

Email: RTEP@pjm.com with any questions or clarifications and include a reference to 2014/15 RTEP Long Term Proposal Window

2014/15 RTEP Long Term Proposal Window

I. Purpose of Proposal

PJM seeks technical solution alternatives (hereinafter referred to as “Proposals”) to resolve potential reliability criteria violations, market efficiency congestion, and Reliability Pricing Model (RPM) constraints on facilities identified below in accordance with planning (PJM, NERC, SERC, RFC, and Local Transmission Owner criteria) and market efficiency criteria.

II. Criterion applied by PJM for this proposal window:

A) Reliability Criteria

- i) 15 Year Reliability Analysis
- ii) Long Term Transmission Owner Criteria

B) Market Efficiency Criteria

- i) Market Efficiency Congestion
- ii) Limiting Facilities in Reliability Pricing Model (RPM)

III. Terminology

For Reliability proposal windows, PJM will distribute an Excel workbook of potential violations on facilities identified through a series of analyses. The following column headings are generally representative of the data fields that will be used to identify the specific facility and other factors of the output of this analysis. Not all column headings will appear in every sheet within the workbook. Additional information deemed necessary by PJM will be provided on a separate sheet along with the results file.

Typical thermal analysis column headings:

Column Headings	Title	Description
FG #	Flowgate Number	A sequential numbering of the identified potential violations

Fr Bus	From Bus Number	PSSE model Bus number corresponding to one end of line identified as a potential violation
Fr Name	From Bus Name	PSSE model Bus name corresponding to one end of line identified as a potential violation
To Bus	To Bus Number	PSSE model Bus number corresponding to other end of line identified as a potential violation
To Name	To Bus Name	PSSE model Bus name corresponding to other end of line identified as a potential violation
CKT	Circuit	Circuit number of identified potential violation
KVs	Kilovolt level (A/B)	Kilovolt level of both sides of potential violation, if A does not equal B, potential violation is a transformer
Areas	Area Numbers (A/B)	Area numbers of both ends of potential violation (A=From Bus Area Number, B=To Bus Area Number) If A does not equal B, potential violation is a tie line
100% Year	Year of Violation	This is the year in which PJM has determined that the identified facility may reach 100% of its rating.
Contingency	Contingency	Event causing overload, names corresponding to specific contingency within contingency file
Test	Test	Type of analysis causing violation, indication of which files to use for analysis replication

For Market Efficiency proposal windows, PJM will post an Excel workbook of simulated congested facilities for the relevant study years that were identified through the analysis. The following column headings are generally representative of the data fields that will be used to identify the specific facility and other factors of the output of this analysis. Additional information will be provided as necessary by PJM.

Typical Market Efficiency column headings:

Column Headings	Title	Description
Facility Name	Facility Name	Description of Facility
AREA	AREA	Identifies the PJM Transmission Zone for the Facility. M2M signifies a Market to Market facility.
TYPE	TYPE	Identifies the type of facility such as a Transformer, Interface, or a Transmission Line.
Frequency (Hours)	Frequency	Number of hours the facility is constrained for the annual study year of the simulation
Market Congestion (\$millions)	Market Congestion	Total annual congestion dollars for the facility as a result of the simulation
Potential Upgrade	Potential Upgrade	Identifies potential upgrades to relieve congestion for the facility.

IV. Analysis Procedure

PJM Planning follows a documented procedure for all RTEP analysis as set forth in PJM Manual 14B. This problem statement requires participants to perform analysis and identify solutions to potential violations identified using RTEP procedures detailed in Manual 14B, section 2.3, RTEP Reliability Planning, and section 2.6, RTEP Market Efficiency Planning, at:

<http://pjm.com/~media/documents/manuals/m14b.ashx>

Additionally, all proposed solutions must meet the performance requirements outlined in PJM Transmission Owner Criteria:

<http://www.pjm.com/planning/planning-criteria/to-planning-criteria.aspx>

PJM performs a preliminary quality assessment of the analysis in coordination with PJM Transmission Owners, Generation Owners, Neighboring Transmission Owners, and any other affected parties. In this quality assessment PJM reviews potential violations as determined by the analytical tools used throughout RTEP analysis. Through this coordination PJM seeks to identify only the violations for inclusion in the proposal window process. As PJM works through this quality assessment and continues to develop the RTEP analysis, it is possible that identified potential violations will be removed from the potential violation list as determined by PJM Planning. It is also possible that as the analysis continues, other potential violations that were not on the potential violation list originally are added to that list as deemed necessary by PJM Planning.

This process is intended to develop upgrades to address system reliability criteria violations and market efficiency projects. PJM will regularly retool analysis based on updated system information to ensure that solutions address the identified violations, do not cause any new violations, and are still needed to address reliability criteria and/or market efficiency projects.

V. Scope of Work

Through this Proposal window PJM is seeking solutions to identified Reliability Criteria violations, Market Efficiency congestion, and Reliability Pricing Model (RPM) limiting constraints.

Objectives

Reliability:

1. Develop solutions to identified potential violations;
2. Solutions should not cause any additional violations (Such as: Thermal, Voltage, Short Circuit or Stability). If additional violations are caused by the solutions, this should be addressed within proposal package; and
3. Adhere to all PJM, NERC, SERC, RFC and Local Transmission Owner Criteria

Market Efficiency:

4. Identify enhancements or expansion that could relieve PJM transmission constraints stemming from the 2014 Market Efficiency Analysis for which no reliability based project has already been identified.
5. Perform and compare market simulations with and without proposed enhancements or expansions to evaluate if the Benefit/Cost Ratio is at least 1.25 using the criteria as defined in Schedule 6, Section 1.5.7 of the PJM Operating Agreement and PJM Manual 14B, Attachment E.
6. Perform high level reliability analysis of proposed Market Efficiency enhancements or expansions to ensure the proposed enhancement or expansion does not create any reliability issues.

What PJM Provides:

The following data and related information is required for this analysis and is expected to be available from PJM:

Reliability Modeling Data:

The following data is provided (Please note these files are Critical Energy Infrastructure Information (CEII) and should be handled accordingly):

1. **Base Power Flow Case.**
 - a. This window addresses a variety of reliability criterion that span several corresponding power flow cases. The data in the Excel spreadsheet notes which case(s) correspond to each identified reliability criteria violation.
2. **Contingency List.** All Contingency Types (Single, Bus, Tower, Line w/ stuck breaker).
3. **Subsystem File.** Identifying all subsystem zones to be considered in analysis.
4. **Monitor File** Identifying specific ranges of facilities by area and kV level to be considered in analysis.
5. **Applicable Ratings (if different from what is in case)**
6. **Excel Workbook** containing the detailed power flow results and any additional technical comments.

Market Efficiency Modeling Data:

The following data and related information is provided for this proposal window. This data is provided through the PJM 2014 Market Efficiency web page, the PJM Transmission Expansion Advisory Committee (TEAC) materials, or on the PJM RTEP Development web pages.

The following data is provided:

1. **2014 Market Efficiency Economic Models:** These models contain the base set of PROMOD data for the 2014 Market Efficiency Analysis. Access to these models requires CEII authorization (available on the PJM web site: <http://www.pjm.com/planning/rtep-development/market-efficiency.aspx>) along with an active license with Ventyx for PROMOD and Nodal Simulation Data. PROMOD Case and supporting files are available under the Modeling Information section at the following link: <http://pjm.com/planning/rtep-development/market-efficiency.aspx>
2. **Market Efficiency Base Congestion results:** Proposed enhancements or expansions should provide congestion reduction for recommended facilities identified within the results at the

following link: <http://pjm.com/planning/rtep-development/market-efficiency.aspx>. PJM recommends proposals for facilities that meet the below criteria. Facilities below these thresholds are not anticipated to pass the Benefit/Cost threshold because of the expected cost of an upgrade. Congestion for 2025 study year is considered more speculative and therefore will be monitored in future analysis.

a. Market Efficiency Criteria:

- i. Annual simulated congestion frequency of at least 25 hours in both 2019 and 2022 study years.
- ii. Lower voltage facilities: Minimum of \$1 million congestion in both 2019 and 2022 study years.
- iii. Regional facilities: Minimum of \$10 million congestion in both 2019 and 2022 study years.

b. RPM Criteria: PJM will accept proposals to address the following that has had consistent capacity import limitations and thermal overloads.

- i. Roseland-Cedar Grove-Clifton 230 kV corridor

Other Supporting Market Efficiency Data:

Additional Supporting Market Efficiency Data is available at the following link:

<http://pjm.com/planning/rtep-development/market-efficiency.aspx>

1. **2014 Market Efficiency Analysis Input Assumptions:** This file contains the input assumptions used for each study year of the 2014 Market Efficiency Analysis.
2. **Market Efficiency Modeling Practices Document:** This file provides a description of the modeling methods and procedures used for PJM Market Efficiency Analysis.

Response back to PJM (Deliverables)

The following must be provided no later than the close of the window. Please use the PJM provided templates to describe the high level details of your proposal. If the proposer wishes to include more detail, additional narrative may be added to address specifics of your proposal including, but not limited to:

1. Description of the proposed solution and corresponding violation(s) it resolves.
 - a) Describe to PJM if the project should be considered only as a whole or if portions of the project should be considered as well.
2. Detailed analysis report on proposed solutions, including:
 - a) Breaker one-line diagrams to illustrate system topology
 - b) Spreadsheets (e.g. Output of analysis showing solution to identified issue)
 - c) High level estimate of:
 - i. Time to construct the proposed solutions
 - ii. Cost estimates with a description of assumptions (e.g. base cost, risk and contingency (R&C) costs, and total cost)
 - iii. Availability of right of ways
3. Equipment parameters and assumptions
 - a) All parameters (Ratings, impedances, mileage, etc.)
 - b) For reactive devices, settings and outputs
 - c) For synchronous machines, MW and MVAR output assumptions

4. Complete set of power flow and dynamic cases containing proposed solutions (all cases should be solvable, not containing any non-convergence issues, in line with industry standards). If possible, provide a PSS/E IDEV file so that the modeling of the proposal may be easily applied to other models (please only use unused bus numbers for the creation of new busses). Please contact PJM with any questions. Provide any other necessary data including critical contingency files to reproduce the proposed solutions. All cases and data files for dynamic simulations must be in PSS/E ver. 32 format.
5. Modeling for Economic Simulation - Complete set of PROMOD model change files in XML format and power flow cases containing proposed solutions. If it is not possible to provide PROMOD model change files and power flow cases then at a minimum a PSS/E IDEV file compatible with the PJM 2018 RTEP power flow should be provided to facilitate modeling the proposal. Also, provide updated contingency definitions for all contingencies that require modification. Provide any other necessary data including any new monitored elements and contingencies to enable PJM to reproduce the proposed solution's results.
6. Any other supporting documentation required by PJM that is required to perform verification review, that isn't explicitly stated in this document.
7. Submission of Deliverables
 - a) Preferred - VIA electronic mail to RTEP@pjm.com
 - b) Alternate (e.g.: DVD or flash/thumb drive) - VIA FedEx to Nancy Muhl, PJM Interconnection, 2750 Monroe Boulevard, Audubon, PA 19403

PJM requires all proposal solutions, both upgrades to existing facilities and Greenfield projects, to complete the 2014 RTEP Proposal Window Template:

<http://pjm.com/~media/planning/rtep-dev/expand-plan-process/ferc-order-1000/rtep-proposal-windows/2014-rtep-proposal-window-template.ashx>

If the proposal is a Greenfield solution then, the 'Greenfield Project Proposal Template' must also be included in the project proposal package to provide company evaluation and constructability information:

<http://www.pjm.com/~media/planning/rtep-dev/expand-plan-process/ferc-order-1000/order-1000-greenfield-project-proposal-template.ashx>

Proposing entities are required to provide a public and non-public version of the project proposal. Proposing entities should expect that PJM will post the public version of the proposals after the close of the window. The public version must include redactions for any CEII information and information which the proposing entity deems is business proprietary and confidential (Note: PJM reserves the right to review the proposing entity's proposed redactions to ensure the appropriate level of transparency while protecting confidential and proprietary information and CEII)

Proposal Fees

Proposing entities must submit a non-refundable fee of \$30,000 with each greenfield proposal. Within 30 days after the close of this window, PJM will notify the project sponsor if submitted fees are found to be insufficient. If a proposal is submitted without the applicable fee or insufficient funds, the proposal may be excluded from consideration.

The proposal fee requirement conditioned upon issuance of a FERC order accepting PJM’s filing with FERC proposing to add a proposal fee requirement to its open window process developed and endorsed at by the Regional Planning Process Task Force, the Markets and Reliability Committee and Members Committee. In its filing, PJM will request that the proposal fee requirement be effective for this window. Please submit payment to PJM in the form of a check including identification of the associated project proposal.

Timeline

Thursday, 10/30/2014, Opening of 2014/15 RTEP Long Term Proposal Window
 Friday, 2/27/2015, Close of 2014/15 RTEP Long Term Proposal Window

- All proposals and pre-qualification documentation due by 2/27/2015

Action	Target Date
Recipients submit pre-qualification packages and updates to PJM*	On or before 2/27/2015
PJM distributes Problem Statement to RTEP proposal window participants	10/30/2014
Recipients submit questions to PJM	10/30/2014– 2/27/2015
PJM distributes answers to questions to all recipients*	10/30/2014– 2/27/2015
Recipients submit proposals to PJM**	On or before 2/27/2015

*PJM will maintain confidentiality of individual proposals for the duration of the window.

**Any proposals received after close of the proposal will not be accepted.

Document Revision History

V1: October 30, 2014

Original File Posted

V2: October 31, 2014

Long Term Transmission Owner Criteria added to “Criterion applied by PJM for this proposal window” section