



PJM RTEP – 2013 Market Efficiency Proposal Window Problem Statement & Requirements Document

PJM Interconnection

Original Document: August 12, 2013

Version 4

Revised: August 30, 2013

Email: RTEP@pjm.com with any questions or clarifications and include a reference to 2013 Market Efficiency Proposal Window

REQUEST FOR PROPOSAL - 2013 Market Efficiency Congestion

I. Purpose of Proposal

PJM seeks technical solution alternatives (hereinafter referred to as “Proposals”) to relieve constraints on PJM internal facilities identified on the list of Top 25 congestion events for the 2013 Market Efficiency Analysis from study years 2017, 2020, or 2023.

II. Terminology

III. Scope of Work

Objectives

1. Identify enhancements or expansion that could relieve internal PJM transmission constraints from the top 25 congestion events stemming from the 2013 Market Efficiency Analysis for study years 2017, 2020, and 2023 for which no reliability based project has already been identified.¹
2. 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.
3. 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 provided for this proposal window. This data is provided through the PJM 2013 Market Efficiency Project web page, the PJM Transmission Expansion Advisory Committee (TEAC) materials, or on the PJM RTEP Development web pages.

Modeling Data:

¹ Enhancements or expansions that may relieve congestion for Market-to-Market (M2M) facilities and other facilities identified in the PJM/MISO JOA Planning Study as a top 25 congestion event will be studied in coordination with the PJM/MISO Interregional groups.

The following data is provided:

1. **2013 Market Efficiency Economic Models:** These models contain the base set of PROMOD data for the 2013 Market Efficiency Analysis. Access to these models requires both 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.
2. **2013 Market Efficiency Event Files:** These files contain the base case monitored list of events studied under the Market Efficiency Analysis. Access to these files requires both CEII authorization along with an active license with Ventyx for PROMOD and Nodal Simulation Data.
3. PJM RTEP Summer 2018 case and corresponding NERC Category B & C contingency files in PSS/E v 30.3 format.

Other Supporting Data:

1. 2013 Market Efficiency Analysis Input Assumptions: This file contains the input assumptions used for each study year of the 2013 Market Efficiency Analysis.
2. 2013 Market Efficiency Analysis Top 25 Congestion Results: These are the base case congestion results provided in this document. Proposed enhancements or expansions should provide congestion reduction for internal facilities identified within these results.
3. Market Efficiency Modeling Practices Document: This file provides a description of the modeling methods and procedures used for PJM Market Efficiency Analysis.
4. The power flow utilized in the 2013 Market Efficiency Analysis can be obtained with requisite CEII clearance at the following link: <http://www.pjm.com/planning/rtep-development/powerflow-cases.aspx>

Response back to PJM (Deliverables)

1. Name and address of the proposing entity
2. Description of the proposed solution including the location of the proposed project (e.g., source and sink, if applicable).
3. Detailed analysis report on proposed solutions, including:
 - a) Facilities as identified in the 2013 Market Efficiency Analysis Congestion Results of which the proposed project should relieve congestion.
 - b) Breaker one-line diagrams to illustrate system topology
 - c) Proposed project details:
 - i. An initial construction schedule, which should include a proposed timeline includes, at a minimum, the following milestones:
 - i. Engineering
 - ii. Rights of way/land acquisition
 - iii. Long-lead time equipment procurement
 - iv. CPCN/Permitting
 - v. Construction activities

- vi. Major outage windows
 - ii. Proposed project cost with detailed down into the following minimum categories
 - i. Engineering
 - ii. Rights of way/land acquisition
 - iii. Long-lead time equipment procurement
 - iv. CPCN/Permitting
 - v. Construction activities
 - vi. Work to be performed by incumbent Transmission Owners
 - vii. Risk and contingency costs
 - iii. Details of any construction cost caps or commitment the proposing entity wishes PJM to consider in its analysis, including the conditions and exceptions to such construction cost caps or commitments (Note: As per the Tariff, submittal of such proffered cost caps are at the discretion of the proposing entity but will be considered by PJM in its analysis of the costs of various proposals)
 - iv. Availability of right of ways, including the details of rights of way already owned and available for use, an analysis of the entity's plan to obtain necessary permitting, as well as procurement of any additional rights of way including the nature of the rights of way being procured (easements, fee simple purchases, etc.)
4. Equipment parameters and assumptions
 - a) All parameters (Ratings, impedances, mileage, etc.)
 - b) For reactive devices, settings and outputs
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 2017 RTEP power flow should be provided to facilitate modeling the proposal.
6. Modeling for Power Flow Simulation - PSS/E IDEV files compatible with the PJM RTEP Summer 2018 case to model all proposed system changes. If this is difficult for non PSS/E users please contact PJM at RTEP@pjm.com with any questions. 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.
7. Documentation of a high level powerflow contingency analysis (using the powerflow case and contingency files provided by PJM) identifying violations of any thermal ratings. Proposing entities should note any overloads of applicable thermal limits. In the powerflow case, the "Rate A" rating is considered to be the "Normal or Continuous" rating and should be used pre-contingency and the "Rate B" rating is considered to be the "Long Term Emergency" Rating and should be used post-contingency. Note that PJM will perform detailed powerflow, short circuit and stability analysis.
8. If the proposing entity seeks to be designated to construct, own, operate, maintain and finance the proposed project, the proposing entity must provide a statement within the

project proposal package stating the intent to be considered the Designated Entity for the proposed project.

9. Entities that have been pre-qualified for Designated Entity status by the Office of the Interconnection prior to the opening of the Market Efficiency project proposal window are required to submit a statement affirming that the company pre-qualification information on record with PJM and as posted on PJM's website reflects the company's current qualifications to be eligible for Designated Entity status as defined in the PJM Amended and Restated Operating Agreement ("PJM OA") in Section 1.5.8(a) (FERC acceptance pending)
10. In addition, the proposing entity must also include the following information:
 - a) Description of proposing entity's (or its affiliate, partner or parent company) technical and engineering qualifications relevant to construction, operation and maintenance of the proposed project;
 - b) Detailed description of proposing entity's (or its affiliate, partner or parent company) experience in developing, constructing, operating and maintaining the types of transmission facilities included in the project proposal;
 - c) Description of the emergency response capability of the entity that will be operating and maintaining the proposed project;
 - d) Proposed financing for the project including discussion of any cost advantages available to the proposing entity as a result of their financing plan and structure. Such submittal may include a letter of intent from a financial institution approved by the Office of the Interconnection or such other evidence of financial resources available to finance the construction, operation and maintenance of the proposed project.
 - e) Description of proposing entity's (or its affiliate, partner or parent company) managerial ability to contain costs and adhere to construction schedules for the proposed project, including a description of verifiable past achievements;
 - f) List of assumptions used in developing the project proposal package such as work to be executed by incumbent Transmission Owner(s).
11. Any other supporting documentation or information required for PJM to validate the proposal's performance or that the proposing entity wishes to submit to assist the Office of the Interconnection to consider in evaluating the proposed project.
12. For those entities seeking Designate Entity status, any other supporting documentation or information required for PJM to evaluate the proposing entity as a Designated Entity candidate per the evaluation criteria listed below and found in the PJM Amended and Restated Operating Agreement ("PJM OA") in Section 1.5.8(f) (FERC acceptance pending):
 - a) whether in its proposal, the entity indicated its intent to be the Designated Entity;
 - b) whether the entity is pre-qualified to be a Designated Entity pursuant to Section 1.5.8(a);
 - c) information provided either in the proposing entity's submission pursuant to Section 1.5.8(a) or 1.5.8(c)(2) relative to the specific proposed project that demonstrates:
 - i. the technical and engineering experience of the entity or its affiliate, partner, or parent company, including its previous record regarding

- construction, maintenance, and operation of transmission facilities relative to the project proposed;
- ii. ability of the entity or its affiliate, partner, or parent company to construct, maintain, and operate transmission facilities, as proposed,
 - iii. capability of the entity to adhere to standardized construction, maintenance, and operating practices, including the capability for emergency response and restoration of damaged equipment;
 - iv. experience of the entity in acquiring rights of way;
 - v. evidence of the ability of the entity, its affiliate, partner, or parent company to secure a financial commitment from an approved financial institution(s) agreeing to finance the construction, operation, and maintenance of the project, if it is accepted into the recommended plan; and
- d) any other factors that may be relevant to the proposed project.

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 non-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)

Submission of Deliverables

- a) Preferred - VIA electronic mail to RTEP@pjm.com
- b) Alternate - VIA FedEx to Nancy Muhl, PJM Interconnection, 955 Jefferson Avenue, Norristown, PA 19403

Timeline

Monday, 8/12/2013, Opening of 2013 Market Efficiency RTEP Proposal window

Thursday, 9/26/2013, Close of 2013 Market Efficiency RTEP Proposal window

- All proposals and pre-qualification documentation due by 9/26 23:59 EDT

Action	Target Date
PJM distributes RFP to 2013 Market Efficiency RTEP proposal window participants	8/12/2013
RFP recipients submit questions to PJM	8/12/2013 – 9/26/2013
PJM distributes answers to questions to all recipients*	8/12/2013 – 9/26/2013
Recipients submit proposals to PJM**	On or before 9/26/2013 23:59 EDT
Recipients submit pre-qualification packages to PJM**	On or before 9/26/2013 23:59 EDT

*PJM will maintain confidentiality of individual proposals for the duration of the window, but will distribute general information to the 2013 Market Efficiency RTEP proposal window participants

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

2013 Market Efficiency Congestion

The following is a list of the top 25 congestion events from the 2013 Market Efficiency Cycle for study years 2017, 2020, and 2023.

Top 25 Market Efficiency Congestion Events for Study Years 2017, 2020, and 2023

Constraint Name	Area	Type	2017		2020		2023	
			Frequency (Hours)	Market Congestion (\$ millions)	Frequency (Hours)	Market Congestion (\$ millions)	Frequency (Hours)	Market Congestion (\$ millions)
Breed 345kV to Wheatland Power Facility 345kV	M2M	LINE	3029	\$57.5	2933	\$61.9	2843	\$70.6
AP SOUTH L/O BED-BLA	PJM	INTERFACE	918	\$42.7	946	\$55.5	796	\$60.7
Pawnee 345kV to Pawnee 138kV	M2M	Transformer	4795	\$33.7	5517	\$46.3	5383	\$62.5
Hunterstown 230kV to Hunterstown 115kV	METED	Transformer	134	\$8.0	243	\$20.0	446	\$51.7
CLEVELAND INTERFACE	PJM	INTERFACE	115	\$15.6	67	\$7.9	253	\$38.7
Rising 345kV to Rising 138kV	M2M	Transformer	879	\$14.7	635	\$9.3	974	\$21.1
AES Ironwood 230kV to South Lebanon Tap 230kV	METED	LINE	0	\$0.0	44	\$0.2	1547	\$34.5
Crete Energy Park 345kV to St John 345kV	M2M	LINE	798	\$10.8	648	\$11.8	538	\$10.3
Pierce 138kV to Walter C Beckjord 138kV	DEO&K	LINE	19	\$3.1	64	\$10.5	94	\$16.3
Monticello 138kV to East Winamac 138kV	M2M	LINE	98	\$2.4	245	\$7.1	376	\$14.1
Dune Acres 138kV to Michigan City 138kV	M2M	LINE	781	\$4.8	1268	\$10.1	1027	\$6.8
AEP-DOM	PJM	INTERFACE	217	\$6.3	217	\$6.8	155	\$4.2
CTYSTLTP 69kV to Darley 69kV	DP&L	LINE	157	\$2.3	133	\$3.0	219	\$9.0
08STALYN 138kV to Lafayette 138kV	M2M	LINE	0	\$0.0	7	\$0.0	142	\$12.0
Zion 345kV to Zion 345kV	M2M	LINE	83	\$0.6	106	\$4.1	135	\$4.9
Three Mile Island 230kV to Jackson 230kV	METED	LINE	710	\$2.5	733	\$3.4	514	\$2.6
Pruntytown 500kV to Mt Storm 500kV	AP to DVP	500 kV	79	\$1.6	114	\$4.5	64	\$0.9
Wye Mills 69kV to Longwoods 69kV	DP&L	LINE	82	\$1.6	116	\$2.0	163	\$3.2
Haumesser Road 138kV to West Dekalb Tap 138kV	CE	LINE	5	\$0.1	4	\$0.1	165	\$5.2
Streator Cayuga Ridge Wind Farm 345kV to Wilton CTR 345 345kV	CE	LINE	0	\$0.0	6	\$0.1	102	\$5.1
Dean H Mitchell 138kV to US Steel 138kV	M2M	LINE	744	\$1.5	605	\$1.8	531	\$1.9
Roseland 230kV to Montville 230kV	PSEG to JCPL	LINE	1057	\$0.9	1410	\$1.6	1692	\$2.3
Milford 230kV to Cool Springs 230kV	DP&L	LINE	9	\$1.3	14	\$1.8	9	\$1.1
Palmyra 345kV to Palmyra 161kV	M2M	Transformer	141	\$1.4	140	\$1.1	89	\$1.6
Top 25 Congestion Sub-Total:				\$215.0		\$272.8		\$441.9
Total Congestion:				\$227.7		\$294.2		\$464.8
Top 25% of Total Congestion				94.4%		92.7%		95.1%

PJM will not be accepting Market Efficiency proposals for relief of congestion of the "AES Ironwood 230kV to South Lebanon Tap 230kV" facility. The entire congestion for future simulation years on this facility is not valid due to scaling of generation necessary to meet reserve requirements. In particular, if an actual generation interconnection project increased the generation at the Ironwood station than local transmission upgrades would be required which would eliminate the excess loading on the "AES Ironwood 230kV to South Lebanon Tap 230kV" facility. Scaling is part of the existing Market Efficiency requirements and is utilized to meet reserve requirements for simulation years in which there is not enough generation on the system. Any project submitted that is impacted by scaling will be subject to a sensitivity test to ensure the project is robust in the absence of scaling.

Indicates Congestion costs of at least \$20 million in study year 2017, 2020, or 2023.

Document Revision History

Version 1: August 12, 2013

- Original File Posted

Version 2: August 14, 2013

- Updated formatting of document to match PJM standard (Aesthetic changes only)
- Congestion results updated to reflect the removal of the congestion of the Steel City 500 kV to Steel City 230 kV transformer. This congestion was not valid because of the generation modeling at this station. The generation modeling has been updated and did not impact congestion on any other facilities.

Version 3: August 22, 2013

- Congestion Results updated to reflect the following changes.
 - Removed RGGI CO2 emission price from New Jersey thermal units because New Jersey is not part of the RGGI program.
 - Updated ratings for Plymouth Meeting 138 kV to Bryn Mawr 138 kV Line to reflect latest operational ratings.
 - Updated ratings for Corson 138kV to Corson 69kV Transformer to reflect latest operational ratings.
 - Updated ratings for various facilities of which none were included in the top 25 congestion events associated with this proposal window.

Version 4: August 30, 2013

- Congestion Results updated to reflect the following change.
 - Updated ratings for Safe Harbor 230kV to Graceton 230kV Line to reflect updated RTEP ratings.
- Added a note to indicate that PJM will not be accepting Market Efficiency proposals for relief of congestion of the “AES Ironwood 230kV to South Lebanon Tap 230kV” facility. The entire congestion for future simulation years on this facility is not valid due to scaling of generation necessary to meet reserve requirements