PJM RTEP – 2019 RTEP Proposal Window #1

PROBLEM STATEMENT & REQUIREMENTS

DOCUMENT SCOPE: 2024 SUMMER RELIABLITY ANALYSIS; 2024 WINTER RELIABILITY ANALYSIS; 2024 LIGHT LOAD RELIABILITY ANALYSIS

PJM Interconnection

Original Document: July 3, 2019

Version 12

2019 RTEP Proposal Window #1

PURPOSE OF PROPOSAL WINDOW

PJM seeks technical solutions, also called proposals, to resolve potential reliability criteria violations on facilities identified below in accordance with all applicable planning criteria (PJM, NERC, SERC, RFC, and Local Transmission Owner criteria).

CRITERION APPLIED BY PJM FOR THIS PROPOSAL WINDOW:

2024 Summer Baseline Thermal and Voltage N-1 Contingency Analysis
2024 Summer Generator Deliverability and Common Mode Reliability Analysis
2024 Summer Load Deliverability Thermal and Voltage Analysis
2024 Summer N-1-1 Thermal and Voltage Analysis and Voltage Collapse
2024 Winter Baseline Thermal and Voltage N-1 Contingency Analysis
2024 Winter Generator Deliverability and Common Mode Reliability Analysis
2024 Winter Load Deliverability Thermal and Voltage Analysis
2024 Winter N-1-1 Thermal and Voltage Analysis and Voltage Collapse
2024 Light Load Baseline Thermal and Voltage N-1 Contingency Analysis
2024 Light Load Generator Deliverability and Common Mode Reliability Analysis

TERMINOLOGY FOR PROPOSAL WINDOWS

Through the analyses listed above, PJM has compiled a list of criteria violations. The violations and the impacted facilities are identified by a table of flowgates. Descriptions of the column headings are provided below. Different analyses often use different column headings. Provide additional information as needed.

TYPICAL THERMAL ANALYSIS COLUMN HEADINGS:

Column Heading	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
Monitored Facility	Monitored Facility	The circuit on which a potential violation is occurring
Base Rate (MVA)	Base Rate (MVA)	Normal Facility Rating (Rate A)
% Overload	Percentage Overload	Percentage above corresponding Facility Rating
CKT	Circuit ID	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
Rating	Facility Rating	Applicable thermal rating (MVA) of facility
DC Ld(%)	Direct Current Loading percentage	Percentage above Facility Rating determined from DC testing
AC Ld(%)	Alternating Current Loading percentage	Percentage above Facility Rating determined from AC testing
Cont Type	Contingency Type	Contingency categorization (e.g., Single, Bus, Line_FB, Tower)
Cont Name	Contingency Name	Contingency name as identified in associated contingency file or embedded in the spreadsheet
Contingency	Contingency	Contingency description
Violation Date	Violation Date	Date on which violation is expected to occur
Analysis Case	Analysis Case	Case title to use in replicating analysis

TYPICAL VOLTAGE ANALYSIS COLUMN HEADINGS:

Column Heading	**Title**	**Description**
FG #	Flowgate Number	A sequential numbering of the identified potential violations
Bus #	Bus Number	PSSE model bus number corresponding to bus identified as a potential violation
KVs	Kilovolt level	Kilovolt level of bus identified as potential violation
Area	Area Number	Area number of bus identified as potential violation
ContVolt	Contingency Voltage (P.U.)	Per Unit Voltage at identified bus after contingency is applied
BaseVolt	Basecase Voltage (P.U.)	Per Unit Voltage at identified bus before contingency is applied
Low Limit	Low Voltage Limit(P.U.)	Threshold of Per Unit Low voltage, if ContVolt is under this limit, a potential violation is identified
Upper Limit	High Voltage Limit(P.U.)	Threshold of Per Unit High voltage, if ContVolt is over this limit, a potential violation is identified
Cont Type	Contingency Type	Contingency categorization (e.g., Single, Bus, Line_FB, Tower)
Vdrop (%)	Voltage drop	The percentage that the voltage has dropped as a result of the contingency
Contingency	Contingency	Contingency name as identified in associated contingency file
Contingency 1	First Contingency	N-1 (first) contingency identified
Contingency 2	Second Contingency	N-1-1 (second) contingency identified in N-1-1 analysis

PROPOSAL WINDOW EXCLUSION DEFINITIONS

The following definitions explain the basis for excluding flowgates from the competitive planning process and designating projects to the incumbent Transmission Owner.

Flowgates excluded from competition will include the underlined language in the comment field.

- Immediate Need Exclusion: For immediate reliability needs that must be addressed within three years or less and for which PJM determines a proposal window may not be feasible , these reliability violations are excluded from the competitive proposal window process. As a result, the local Transmission Owner will be the Designated Entity. Refer to Operating Agreement, Schedule 6 § 1.5.8(m)
- Below 200kV Exclusion: Due to the lower voltage level of the identified violations, these reliability violations are excluded from the competitive proposal window process. As a result, the local Transmission Owner will be the Designated Entity. Refer to Operating Agreement, Schedule 6 § 1.5.8(n)
- FERC 715 (TO Criteria) Exclusion: For transmission needs driven solely by FERC Form 715 Planning Criteria, these reliability violations are excluded from the competitive proposal window process. As a result, the local Transmission Owner will be the Designated Entity. Refer to Operating Agreement, Schedule 6 § 1.5.8(o)
- Substation Equipment Exclusion: For violations on existing transmission substation equipment, these reliability violations are excluded from the competitive proposal window process. As a result, the local Transmission Owner will be the Designated Entity. Refer Operating Agreement, Schedule 6 § 1.5.8(p)

ANALYSIS PROCEDURE

Participants are expected to develop solutions to the identified criteria violations and perform analysis to validate that the solutions remove these violations. The competitive planning process is documented in PJM Manual 14F, which is available here: http://www.pjm.com/-/media/documents/manuals/m14f.ashx

Proposed solutions must also meet Transmission Owner Planning Criteria which is available here: http://www.pjm.com/planning/planning-criteria/to-planning-criteria.aspx

Although PJM does its best to provide complete and accurate results, changes to the list of violations under consideration are possible. That is, flowgates may be added or removed from consideration in the proposal window. PJM works with Transmission Owners, Generation Owners, neighboring TOs and other affected parties to verify the quality of the analysis. PJM endeavors to minimize such changes and will clearly communicate any changes to the participants.

PJM regularly updates the system model to reflect changes to the transmission system. Analyses are performed to verify that violations are still valid, new violations have not manifest and proposed solutions still address targeted violation.

PJM shall determine the more efficient or cost-effective enhancements and expansion for any violation.

SCOPE OF WORK

PJM is seeking proposals to resolve identified reliability criteria violations.

Criteria violations have been identified for facilities where the loading includes a contribution from a suspended ISA generator in the PJM Generation Interconnection queue. Due to the uncertainty**,** PJM is not seeking competitive proposals to address these criteria violations.

OBJECTIVES

1. Develop complete solutions to identified criteria violations;
2. Develop solutions to all new criteria violations generated as a consequence of proposed solution. Solutions to these secondary violations are required for the proposal to be considered.
3. Adhere to all applicable planning criteria, including PJM, NERC, SERC, RFC and Local Transmission Owner Criteria.

WHAT PJM PROVIDES:

The information listed below is provided to allow replication of PJM analyses. Some of this data is designated Critical Energy Infrastructure Information (CEII). Handle accordingly:

1. Power Flow Base Cases. Identifies one or more system configurations to which planning criteria are applied.
2. Contingency List: Lists all contingency types (single, bus, tower, line w/ stuck breaker).
3. Subsystem Files: Identifies all subsystem zones to be considered in analysis.
4. Monitor Files: Identify specific ranges of facilities by area and kV level to be considered in analysis.
5. Facility Ratings: (if different from those included in the base cases)
6. Violations List: Lists all criteria violations with power flow results and additional technical notes (flowgates). The results indicate the case(s) to which the criteria violations apply.
7. Short Circuit Base Case. This case reflects the 2024 RTEP base case.
8. Breaker Change Files. Lists all over-duty breakers in a specific TO area.
9. TO Criteria Setting Files. Lists settings used for short circuit analysis for each specific TO.
10. TARA Generation Deliverability options files.

RESPONSE BACK TO PJM (DELIVERABLES)

This section describes the required elements of a complete proposal. The absence of any element renders the proposal incomplete and the proposal will not be considered for selection.

Often there are several viable solutions to a given violation. Include alternate approaches in separate proposals. PJM will not accept proposals with multiple options.

Four categories of information are described below: three are required for a complete package and one is conditional.

- Technical analysis files and documentation
- Completed proposal submittal template
- Project diagrams
- Company evaluation and operations and maintenance information (if required)

TECHNICAL ANALYSIS FILES AND DOCUMENTATION

Include the following technical information to provide a complete project proposal package:

1. A detailed analysis spreadsheet showing the planning analysis results for the project.
2. A set of updates to the power flow cases which model the proposed solution. Provide files in a format compatible with PSS/E version 33.10. Provide only solvable and convergent solutions. Include an idv, or equivalent type, file in order to apply changes to other models. Assign a unique identifier when new busses are required. Provide contingencies in a single file for each contingency type. Organize the contingencies into one of three categories:
    a. Modified Contingencies
    b. New Contingencies
    c. Deleted Contingencies
3. List of all proposed equipment along with relevant parameters and assumptions.
    a. All necessary parameters, e.g., equipment ratings, impedances, line lengths, etc.
    b. For reactive devices, settings and outputs
    c. For synchronous machines, MW and MVAR output assumptions
4. An analysis report of proposed solution which identifies the issues being addressed.
5. Additional documentation required to verify the proposal.

PJM PROPOSAL SUBMITTAL FORM

The PJM proposal submittal form captures project details, such as the criteria violations or system constraints that are being targeted by the project, the overall and specific project descriptions and the details of cost commitment, if proposed. A blank template of the proposal submittal form is included with the window information. The form is also available on the Competitive Planning Process page: https://www.pjm.com/planning/competitive-planning-process.aspx.

All proposals will be made public and posted on pjm.com after the proposal window is closed. Mark all critical energy infrastructure information and business confidential information for redaction from this public posting. Redact only information which meets the criteria of CEII or business proprietary and confidential information.

Redaction guidelines can be found in PJM Manual 14F, Section 6.2. Please note that this section provides guidance only. PJM reserves the right to challenge proposed redaction of information in order to ensure the appropriate level of transparency.

PROJECT DIAGRAMS

Provide project diagrams to detail how the proposed solution will modify existing infrastructure and how new infrastructure will be configured and where new infrastructure will be sited. Project diagrams include, but are not limited to the following:

- Single line diagrams
- Substation general arrangement and station layout. If expanding the substation, identify the following:
  - Area to be modified
  - Land ownership or acquisition plan
- Line routing diagram:
  - Identify proposed route of new or upgraded transmission lines
  - Clearly identify where acquisition of additional right-of-way is required
- Detailed project schedule. Include, at minimum, the following major work activities:
  - Engineering and Design
  - Siting and Permitting
  - ROW and Land acquisition
  - Material procurement
  - Construction
  - Testing/Commissioning

COMPANY EVALUATION AND OPERATIONS AND MAINTENANCE INFORMATION

For proposers seeking Designated Entity status, provide additional information which will aid PJM in understanding how the proposed solution will be developed, constructed, operated and maintained. Include this information as a separate document within the proposal package.

TRANSMITTAL OF PROPOSALS

Utilize the PJM secure file transfer system for the submission of proposals. The address of the portal is https://sftp.pjm.com/.

Submit all files required for submission of a complete proposal as a single file. Submit a separate file for each proposal.

PROPOSAL FEES

Each proposal submitted to the 2019 RTEP Proposal Window 1 is subject to a fee. The fee is based on the estimated cost, in current year dollars, of the complete proposed solution. Include in the cost estimate, all elements described in the proposal, including upgrade work completed by other entities and work needed to alleviate new violations caused by the project.

The fee schedule is:

Total Project Cost	**Proposal Fee**
$20M or less	No fee
Between $20M and $100M	$5,000.00
$100M or more	$30,000.00

The proposal fee is due at the time of submission. Pay the fee by wire transfer to PJM Interconnection at:

[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]

To ensure proposal fee is properly accounted for, include a reference to "Order 1000" in the subject, notes or addenda field of the wire transfer form.

TIMELINE

7/3/2019: Opening of 2019 RTEP Proposal Window 1

9/6/2019: Close of 2019 RTEP Proposal Window 1 at 11:59 p.m. Eastern Daylight Time

Notes:

- Confidentiality of individual proposals will be maintained for the duration of the window.
- Proposals received after close of the proposal window will not be accepted.

QUESTIONS

Submit all questions about the proposal window to the PJM Planning Community. Submit questions involving confidential information or CEII under the "Confidential" topic on the Planning Community. Answers will be provided to all participants in the proposal window.

Please reference 2019 RTEP Proposal Window 1 in all correspondence.

DOCUMENT REVISION HISTORY

10/01/2019–V12 – Removed N1-ST46, GD-S5, GS-D7, N2-ST69, N2-ST70 and N2-ST71 from the list of violations

These previously excluded flowgates have been removed from the list of violations. Supplemental project s1838, which addresses need DOM-2018-012, mitigates the violations identified by these flowgates.

8/23/2019– V11 – Removed N2-ST11 and N2-ST12 from the list of violations
These flowgates are not valid violations but are addressed by existing Remedial Action Schemes (RAS).

8/20/2019– V10 – Case Updates
In working with its Transmission Owners, PJM has identified 2 corrections to the power flow cases. One is a rating correction on the Stubey Road – Sturgis 69 kV line and the other a modelling correction to 2 normally open circuits in the Sturgis area. The following idv files have been added to correct the base case:

For the summer case, apply:
- StubeyRD - Sturgis rating fix.idv and
- Sturgis Normally Open Lines,idv

For Winter & Light Load cases, apply:
- Sturgis Normally Open Lines,idv

After applying these corrections, the following changes to the list of violations:
- Remove 12 flowgates from the list of violations: N2-ST45, N2-ST46, N2-ST47, N2-ST48, N2-ST49, N2-ST50, N2-ST51, N2-ST52, N2-ST53, N2-ST54, N2-ST55, N2-ST56.
- Add 3 new flowgates: N2-ST74,N2-ST75, N2-ST76

Analysis Review
As a result of PJM's ongoing review of the results, the following modifications are needed:
- Add 4 new violations: N2-ST77, N2-ST78, N2-ST79, N2-ST80.
- Change the status of 6 flowgates from "TBD" to "No" (not included in the competitive window): N2-ST63, N2-ST64, N2-ST65, N2-ST66, N2-ST67, N2-ST68.

  Note: All 10 of these flowgates are ineligible for competitive window since the violations are with facilities outside of the PJM territory.

8/09/2019– V9 – Removed GD-S532 from the list of violations
PJM has determined that "No Reinforcement required at this time." This flowgate had been listed as "TBD" since the apparent violation involved a non-PJM tie line facility.

8/07/2019– V8 – Corrected 1 contingency:
Kam-Natrium-138-correction.con

Excluded 1 flowgate:
N1-SVD3 related to the ACE_P5_CORSON contingency overload due to the immediate need exclusion.

8/06/2019– V7 – 1. Added 2 updates to the case files:

Summer & Light Load Cases:
- AEP_b2605-b2791-s1160_RTEP 2019 Series_2024SUM.idv

Winter Case:
- AEP_b2605-b2791-s1160_RTEP 2019 Series_2024WIN.idv

2. Added 2 flowgates: N2-ST72 & N2-ST73
These flowgates addressed by b3104 so are not open to competition.

3. Excluded 58 flowgates from the competitive window:

N1-ST50, N1-ST51, GD-S315 and GD-S316 due to the below 200 kV exclusion
54 flowgates related to the ACE_P5_CORSON contingency overload due to the immediate need exclusion.

- 3 Summer N-1 thermal,
- 19 Summer N-1 voltage magnitude,
- 19 Summer N-1 voltage drop, and
- 13 Light Load N-1 voltage magnitude violations.

7/29/2019– V6 – Revised the numbering of one flowgate to eliminate duplicate IDs.
N1-SVM12 (Rio GRD1) changed to N1-SVM13

7/15/2019– V5 – Removed flowgates N1-SVD47 and N1-SVD48 from the list of violations in the summer case.

7/10/2019– V4 – Extended proposal window extended by 3 days. All proposals are now due on Friday, 9/6/2019.

7/10/2019– V3 – Removed flowgates N2-SVM28 and N2-SVM29 from the list of violations in the summer case.
Moved all version history notations to the Problem Statement.

7/5/2019– V2 – Added flowgate identifiers to the flowgates in the light load case.
Corrected the year of the original posting in the flowgate summary files.

7/3/2019 – V1 – Original Problem Statement posted to the PJM Competitive Planning Process webpage: https://www.pjm.com/planning/competitive-planning-process.aspx.