Supplemental Projects Planning Process

Lessons Learned

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April 12, 2019
Drivers of Supplemental Projects

- Supplemental Projects are transmission expansions or enhancements that are required to address:
  - Equipment Material Condition, Performance, and Risk
  - Operational Flexibility and Efficiency
  - Infrastructure Resilience
  - Customer Service
  - Other Drivers

- While Supplemental Projects have a range of drivers, they improve or preserve the PJM TOs’ ability to provide reliable service to their customers consistent with their obligation to serve and are grounded in good utility practice.
Drivers of Supplemental Projects

As listed in each of the PJM TOs’ Assumptions presentations for the Subregional RTEP meetings, there are five major drivers of Supplemental Projects:

1. Equipment Material Condition, Performance, and Risk: Degraded equipment performance, material condition, obsolescence, equipment failure, employee and public safety, and environmental impact.
   - These projects are investments needed to ensure the safe and reliable operation of the transmission system. The decision to pursue such projects can be based on equipment performance, obsolescence and expected service life concerns, condition of equipment, reliability impact, increased maintenance costs, and engineering recommendations.

2. Operational Flexibility and Efficiency: Optimizing system configuration, equipment duty cycles, and restoration capability; minimizing outages.
   - These projects can reduce the impact on and limit exposure to our customers for planned or forced events and can facilitate improved restoration times. They can also opportunistically bring the system up to current standards and design principles.
Drivers of Supplemental Projects

3. Infrastructure Resilience: Improve system ability to anticipate, absorb, adapt to, and/or rapidly recover from a potentially disruptive event, including severe weather, geo-magnetic disturbances, physical and cyber security challenges, and critical infrastructure reduction.
   - These projects are designed to reduce the impact to our customers of disruptive natural or man made events. These projects can also improve the operability of the system and will reduce customer exposure.

   - These projects accommodate new, increasing, or future load so that the system can reliably address customer needs. They also include improvements to facilities that serve our customers.

5. Other Drivers: Meet objectives not included in other definitions.
   - Project drivers can include: industry recommendations, potential generation retirements, technological pilot projects, and state policy objectives.
Supplemental Project Planning Process – Attachment M-3

- FERC directed changes to the Attachment M-3 Supplemental Project planning process proposed by the PJM TOs in its February 15, 2018 Order (ER17-179).
  - Changes directed by FERC to ensure compliance with Order No. 890’s transparency and coordination principles.
  - Stakeholders receive information about the assumptions, needs, solutions and Local Plans behind Supplemental Projects through stakeholder meetings, the PJM website, and discussions with the PJM TOs coordinated by PJM.
  - Per FERC’s directives, Subregional RTEP and TEAC processes include (1) the criteria, models, and assumptions that they use in planning Supplemental Projects, (2) identified transmission needs, (3) proposed transmission solutions, and (4) Local Plan submittals through separate meetings and/or in separate postings, each preceded and followed by the opportunity for stakeholder feedback.
Supplemental Project Planning Process – Attachment M-3

- Revised process: Assumptions, Needs, and Solutions Meetings and Local Plan Submittal
  - The three meetings are separated by a minimum 25-day review period, allowing sufficient time for stakeholders to provide feedback before and after meetings and for the PJM TOs to consider that feedback
  - Prior to finalizing, PJM performs a “do no harm” analysis after the solutions meeting to ensure that the selected solution does not result in other reliability criteria violations
  - PJM also considers whether there is a Baseline Project that already meets the identified need
  - Timelines in Appendix
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Materials Posted In Advance</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Opportunity for Stakeholder Feedback Before and After Meetings</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Unique Slide Identifiers</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Process Stage Identifiers</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Assumption References</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Bubble Diagrams</td>
<td>Infrequently</td>
<td>Yes</td>
</tr>
<tr>
<td>Separate Discussions of Needs and Solutions</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Guidance to Stakeholders on Comment &amp; Process Status</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Standardization of TO Presentations</td>
<td>No</td>
<td>Yes (work continues)</td>
</tr>
<tr>
<td>Regularly Scheduled Meetings</td>
<td>As Needed</td>
<td>Yes</td>
</tr>
<tr>
<td>Project Drivers</td>
<td>Sometimes</td>
<td>Yes</td>
</tr>
<tr>
<td>Problem Statements</td>
<td>Sometimes (less detail)</td>
<td>Yes</td>
</tr>
<tr>
<td>Alternatives</td>
<td>Sometimes (less detail)</td>
<td>Yes</td>
</tr>
<tr>
<td>Maps</td>
<td>Sometimes (less detail)</td>
<td>Yes</td>
</tr>
</tbody>
</table>
Continuing Process Improvements

- The PJM TOs are fully complying with the requirements of the Show Cause Order.

- In implementing the Attachment M-3 process, the PJM TOs have enhanced transparency.
  - CONSISTENCY: With PJM, the PJM TOs worked to ensure consistency in the types of information that the PJM TOs present at the Subregional RTEP and TEAC meetings and throughout the Supplemental Project planning process
  - RESPONSIVENESS: In the six months since the Attachment M-3 process has been implemented, the PJM TOs have been responsive to stakeholder requests for information
  - COLLABORATION: PJM and the PJM TOs have committed to stakeholders to schedule periodic “lessons learned sessions” to gather stakeholder feedback on the Attachment M-3 process

- The PJM TOs remain committed to working with PJM and Stakeholders on further improvements to Attachment M-3 Process
APPENDICIES
APPENDIX 1
## Supplemental Project Planning Process – Assumptions Meeting

<table>
<thead>
<tr>
<th>Activity</th>
<th>Timing</th>
<th>Day</th>
<th>Who</th>
<th>How</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Posting of Annual Assumptions Meeting date (others may occur throughout the year as needed)</td>
<td>Annually</td>
<td>-45 (approx.)</td>
<td>PJM</td>
<td>Web posting on Sub-regional RTEP pages</td>
</tr>
<tr>
<td>2 Submittal of materials for Annual Assumptions Meeting</td>
<td>5 days before posting date</td>
<td>-25</td>
<td>TO</td>
<td>Email to PJM</td>
</tr>
<tr>
<td></td>
<td>25 days before Assumptions meeting</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3 Posting of TO Assumptions meeting information</td>
<td>20 days before Assumptions Meeting</td>
<td>-20</td>
<td>PJM</td>
<td>Web posting of meeting materials</td>
</tr>
<tr>
<td>4 Assumptions Meeting</td>
<td></td>
<td>0</td>
<td>All</td>
<td></td>
</tr>
<tr>
<td>5 Stakeholder Comments</td>
<td>10 days after Assumptions Meeting</td>
<td>+10</td>
<td>Stakeholders</td>
<td>Email to PJM, PJM posts comments</td>
</tr>
<tr>
<td>6 TOs review and consider stakeholder comments</td>
<td>10 days after comments received</td>
<td>&gt; +10</td>
<td>TOs</td>
<td>Based upon comments, TO may add information in revised slides sent to PJM and PJM re-posts</td>
</tr>
</tbody>
</table>
## Supplemental Project Planning Process – Needs Meeting

<table>
<thead>
<tr>
<th>Activity</th>
<th>Timing</th>
<th>Day</th>
<th>Who</th>
<th>How</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Send Needs Meeting slides to PJM</td>
<td>15 days prior to Needs Meeting</td>
<td>-15</td>
<td>TO and Stakeholders</td>
<td>Email to PJM</td>
</tr>
<tr>
<td>2 Finalize Needs Meeting slides (i.e., add maps)</td>
<td>Upon receipt of slides, prior to posting date</td>
<td>&gt; -10</td>
<td>PJM</td>
<td>Revises supplied slides</td>
</tr>
<tr>
<td>3 Posts Needs Meeting slides</td>
<td>10 days before Needs Meeting</td>
<td>-10</td>
<td>PJM</td>
<td>Web posting of meeting materials</td>
</tr>
<tr>
<td>4 Needs Meeting</td>
<td></td>
<td>0</td>
<td>All</td>
<td></td>
</tr>
<tr>
<td>5 Stakeholder Comments</td>
<td>10 days after Needs Meeting</td>
<td>+10</td>
<td>Stakeholders</td>
<td>Email to PJM, PJM posts comments</td>
</tr>
<tr>
<td>6 TOs review and consider stakeholder comments</td>
<td>10 days after comments received</td>
<td>&gt; +10</td>
<td>TOs</td>
<td>Based upon comments, TO may add information in revised slides sent to PJM and PJM re-posts</td>
</tr>
</tbody>
</table>

Note: Stakeholders may communicate needs that they have that may be independent of those presented by the TO at any time.
## Supplemental Project Planning Process – Solutions Meeting

<table>
<thead>
<tr>
<th>Activity</th>
<th>Timing</th>
<th>Day</th>
<th>Who</th>
<th>How</th>
</tr>
</thead>
<tbody>
<tr>
<td>1  Send Solutions Meeting slides, and for proposed</td>
<td>15 days prior to Solutions Meeting</td>
<td>-15</td>
<td>TOs and Stakeholders</td>
<td>Email to PJM</td>
</tr>
<tr>
<td>solution modeling information (contingency files,</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IDEV, etc.) to PJM</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2  Finalize Solutions Meeting slides (i.e., add</td>
<td>Upon receipt of slides, prior to posting</td>
<td>&gt; -10</td>
<td>PJM</td>
<td>Revises supplied slides</td>
</tr>
<tr>
<td>single-line diagrams)</td>
<td>date</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3  Posts Solutions Meeting slides</td>
<td>10 days before Solutions Meeting</td>
<td>-10</td>
<td>PJM</td>
<td>Web posting of meeting materials</td>
</tr>
<tr>
<td>4  Solutions Meeting</td>
<td>0</td>
<td></td>
<td>All</td>
<td></td>
</tr>
<tr>
<td>5  Stakeholder Comments</td>
<td>10 days after Solutions Meeting</td>
<td>+10</td>
<td>Stakeholders</td>
<td>Email to PJM, PJM posts comments</td>
</tr>
<tr>
<td>6  TOs review and consider stakeholder comments</td>
<td>&gt; +10</td>
<td></td>
<td>TOs</td>
<td>Based upon comments, TO may add information in</td>
</tr>
<tr>
<td>7  No Harm analysis performed for proposed solution</td>
<td>After comments for Solution Meeting</td>
<td>&gt; +10</td>
<td>PJM</td>
<td>Web posting indicating status on Solutions</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Meeting slide</td>
</tr>
<tr>
<td>Activity</td>
<td>Timing</td>
<td>Day</td>
<td>Who</td>
<td>How</td>
</tr>
<tr>
<td>----------</td>
<td>--------</td>
<td>-----</td>
<td>-----</td>
<td>-----</td>
</tr>
<tr>
<td>1 Send Local Plan slides (including Comment Deadline) with selected solutions and updated modeling information (if necessary) to PJM</td>
<td>TO discretion</td>
<td></td>
<td>TOs</td>
<td>Email to PJM</td>
</tr>
<tr>
<td>2 Finalize Local Plan slides if necessary (i.e., updated maps, etc.)</td>
<td>Upon receipt of slides, prior to posting date</td>
<td></td>
<td>PJM</td>
<td></td>
</tr>
<tr>
<td>3 Local Plan posted (including comment deadline)</td>
<td>5 days after receipt of slides</td>
<td></td>
<td>PJM</td>
<td>Web posting (PJM to determine appropriate location)</td>
</tr>
<tr>
<td>4 Stakeholder comment deadline</td>
<td>At least 10 days after Local Plan posting</td>
<td>&gt; -10</td>
<td>Stakeholders</td>
<td>Email to PJM, PJM posts comments</td>
</tr>
<tr>
<td>5 Review and consider Stakeholder Comments</td>
<td>Until Local Plan submittal</td>
<td>&gt; -10</td>
<td>TOs</td>
<td>Based upon comments, TO may add information in revised slides sent to PJM and PJM re-posts</td>
</tr>
<tr>
<td>6 Local Plan submitted for integration into RTEP</td>
<td>At least 10 days after comment deadline</td>
<td>0</td>
<td>TOs</td>
<td>Email final Local Plan slides to PJM</td>
</tr>
<tr>
<td>7 Post final Local Plan slides</td>
<td>5 days after receipt of slides</td>
<td>+5</td>
<td>PJM</td>
<td>Web posting (PJM to determine appropriate location)</td>
</tr>
</tbody>
</table>
Supplemental Project Planning Process – Needs Template

<TO> Transmission Zone M-3 Process
<locale>

**Need Number:** <need ID>

**Process Stage:** Need Meeting <date>

**Supplemental Project Driver:**
<driver>

**Specific Assumption References:**
<assumption>

**Problem Statement:**
<description>

**Geographic Map:**
Include all facilities mentioned on slide, small locator map and a legend.
Supplemental Project Planning Process – Solutions Template

<TO> Transmission Zone M-3 Process
<project name>

Need Number: <need ID>
Process Stage: Solutions Meeting <date>
Previously Presented:
<stage> <date>
Supplemental Project Driver:
<driver>
Specific Assumption References:
<reference>
Problem Statement:
<description>

Geographic Map:
Include all facilities mentioned on slide, small locator map and a legend.
Supplemental Project Planning Process – Solutions Template

<TO> Transmission Zone M-3 Process
<project name>

Need Number: <need ID>
Process Stage: Solutions Meeting <date>
Proposed Solution:
<description> <cost>
Alternatives Considered:
1. <description> <cost>
2. <description> <cost>
Projected In-Service: <IS-Date>

Bubble Diagram
Supplemental Project Planning Process –
Inclusion in Local Plan Template

<TO> Transmission Zone M-3 Process
<project name>

Need Number: <need ID>

Process Stage: Submission of Supplemental Project for inclusion in the Local Plan <date>

Previously Presented:
<stage> <date>
<stage> <date>

Supplemental Project Driver:
<driver>

Specific Assumption References:
<reference>

Problem Statement:
<description>

Geographic Map:
Include all facilities mentioned on slide, small locator map and a legend.
Supplemental Project Planning Process – Inclusion in Local Plan Template

Need Number: <need ID>
Process Stage: Submission of Supplemental Project for inclusion in the Local Plan <date>
Selected Solution:
<description>
Estimated Cost: <cost>
Projected In-Service: <IS-Date>
Supplemental Project ID: <sxxxx>

Bubble Diagram
APPENDIX 3
Example: Equipment Material Condition, Performance and Risk

Typical Aging Infrastructure

Typical New Construction
Example: Infrastructure Resilience

PSE&G Ewing Substation Storm Hardening

May 27, 2018 storm
Example: Infrastructure Resilience

BGE Concord Street Substation
Example: Equipment Material Condition, Performance and Risk

**AEP - Ohio**

<table>
<thead>
<tr>
<th>Poston-Harrison 138 kV Line</th>
</tr>
</thead>
<tbody>
<tr>
<td>Retire and rebuild approximately 55 miles of 1954 vintage 138 kV system in Athens and Hocking County, Ohio.</td>
</tr>
<tr>
<td>Cost: $62 million</td>
</tr>
</tbody>
</table>
Example: Equipment Material Condition, Performance and Risk

AEP - Ohio

Burnt hole in pole

Split pole with rot heart

Rotten crossarm
Example: Equipment Material Condition, Performance and Risk

AEP - Ohio

Ground line rot with potential to affect shell

Rotten crossarm

Disconnected top brace
Questions?