Transmission Expansion Advisory Committee – FirstEnergy (Penelec) Supplemental Projects

May 12, 2020
Needs

Stakeholders must submit any comments within 10 days of this meeting in order to provide time necessary to consider these comments prior to the next phase of the M-3 process
Need Number: PN-2020-001
Process Stage: Need Meeting 5/12/2020
Project Driver:

*Equipment Material Condition, Performance and Risk*

Specific Assumption Reference:
Substation Condition Rebuild/Replacement

Problem Statement:
Hooversville #3 230/115 kV Transformer
- Transformer has increased failure probability due to:
  - Transformer is 43 years old.
  - Type “U” bushings
  - High level heating gases and moisture
  - Obsolete parts
  - Nitrogen and oil leaks

Transformer circuit rating is the existing transformer rating of 245/306 MVA (SN/SE).
Need Number: PN-2020-002  
Process Stage: Need Meeting 5/12/2020  
Project Driver:  
*Equipment Material Condition, Performance and Risk*  
Specific Assumption Reference:  
Substation Condition Rebuild/Replacement  
Problem Statement:  
Erie West #1 345/115 kV Transformer  
- Transformer has increased failure probability due to:  
  - Transformer is 47 years old.  
  - High level heating gases and moisture  
  - HV bushings have significant deterioration  
  - Obsolete parts  
  - Nitrogen and oil leaks  

Transformer circuit rating is the existing transformer rating of 266/333 MVA (SN/SE).
**Need Number:** PN-2020-005

**Process Stage:** Needs Meeting 5/12/2020

**Project Driver:**
*Equipment Material Condition, Performance and Risk*
*Operational Flexibility and Efficiency*

**Specific Assumption Reference:**
System Performance Projects Global Factors
- System reliability and performance
- Substation/line equipment limits

Upgrade Relay Schemes
- Relay schemes that have a history of misoperation
- Obsolete and difficult to repair communication equipment (DTT, Blocking, etc.)
- Communication technology upgrades
- Bus protection schemes

*Continued on next slide...*
Problem Statement:
• FirstEnergy has identified protection schemes using a certain vintage of relays and communication equipment that have a history of misoperation.
• Proper operation of the protection scheme requires all the separate components perform adequately during a fault.
• In many cases the protection equipment cannot be repaired due to a lack of replacement part and available expertise in the outdated technology.
• Transmission line ratings are limited by terminal equipment.

<table>
<thead>
<tr>
<th>Need Number</th>
<th>Transmission Line / Substation Locations</th>
<th>Existing Line Rating (SN / SE)</th>
<th>Existing Conductor Rating (SN / SE)</th>
<th>Limiting Terminal Equipment</th>
</tr>
</thead>
<tbody>
<tr>
<td>PN-2020-005</td>
<td>Erie South – Erie West 345 kV Line</td>
<td>1222/1385</td>
<td>1639/1999</td>
<td>Line Traps, Line Relaying, Substation Conductor, Line Drop</td>
</tr>
</tbody>
</table>
**Need Number:** PN-2020-007  
**Process Stage:** Need Meeting 05/12/2020  
**Project Driver:**  
*Equipment Material Condition, Performance and Risk*  
**Specific Assumption Reference:**  
Substation Condition Rebuild/Replacement  
System Performance Projects Global Factors  
**Problem Statement:**  
Altoona #1 230-46 kV Transformer  
• Transformer has increased failure probability due to:  
  • Transformer is 55 years old  
  • Poor oil quality in LTC  
  • Nitrogen leaks in tank  
  • Bushing H3 oil leaks  

Transformer circuit rating is 89/97 MVA (SN/SE) and the existing transformer rating is 90/97 MVA (SN/SE). (substation conductor)
Need Number: PN-2020-008

Process Stage: Need Meeting 05/12/2020

Project Driver:

*Equipment Material Condition, Performance and Risk*

Specific Assumption Reference:

Substation Condition Rebuild/Replacement

System Performance Projects Global Factors

Problem Statement:

Altoona #2 230-46 kV Transformer

- Transformer has increased failure probability due to:
  - Transformer is 47 years old
  - Nitrogen leak in tank
  - LTC oil leak
  - Pump flanges are leaking
  - SCADA alarms are not functional

Transformer circuit rating is 89/97 MVA (SN/SE) and the existing transformer rating is 91/97 MVA (SN/SE). (substation conductor)
Questions?
Appendix
## High level M-3 Meeting Schedule

<table>
<thead>
<tr>
<th>Activity</th>
<th>Timing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Posting of TO Assumptions Meeting information</td>
<td>20 days before Assumptions Meeting</td>
</tr>
<tr>
<td>Stakeholder comments</td>
<td>10 days after Assumptions Meeting</td>
</tr>
</tbody>
</table>

## Assumptions

### Needs

<table>
<thead>
<tr>
<th>Activity</th>
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<tbody>
<tr>
<td>TOs and Stakeholders Post Needs Meeting slides</td>
<td>10 days before Needs Meeting</td>
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<tr>
<td>Stakeholder comments</td>
<td>10 days after Needs Meeting</td>
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## Needs

### Solutions

<table>
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<th>Activity</th>
<th>Timing</th>
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<tbody>
<tr>
<td>TOs and Stakeholders Post Solutions Meeting slides</td>
<td>10 days before Solutions Meeting</td>
</tr>
<tr>
<td>Stakeholder comments</td>
<td>10 days after Solutions Meeting</td>
</tr>
</tbody>
</table>

## Solutions

### Submission of Supplemental Projects & Local Plan

<table>
<thead>
<tr>
<th>Activity</th>
<th>Timing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Do No Harm (DNH) analysis for selected solution</td>
<td>Prior to posting selected solution</td>
</tr>
<tr>
<td>Post selected solution(s)</td>
<td>Following completion of DNH analysis</td>
</tr>
<tr>
<td>Stakeholder comments</td>
<td>10 days prior to Local Plan Submission for integration into RTEP</td>
</tr>
<tr>
<td>Local Plan submitted to PJM for integration into RTEP</td>
<td>Following review and consideration of comments received after posting of selected solutions</td>
</tr>
</tbody>
</table>
Revision History

4/29/2020 – V1 – Original version posted to pjm.com