

2021 RTEP Assumptions for Western Sub-region

December 18, 2020

The logo for DP&L, consisting of the letters "DP&L" in a white, serif font, centered within a dark blue oval shape.

DP&L

2021 RTEP Assumptions

Load Flow Cases

- **DP&L participates in the development of**
 - **MMWG base cases**
 - **PJM RTEP cases**
- **Internal cases may be developed using either**
 - **MMWG or**
 - **PJM base cases to study specific system conditions or customer requests**
- **Typical annual load flow model updates include but are not limited to**
 - **Topology updates**
 - **Contingency updates**
 - **Updated load and generation profiles**
 - **Applicable ratings updates, etc.**

Loads

- **DP&L is a summer peaking zone**
- **2020 actual: 3,296 MW non-coincident**
- **PJM projection for 2026: 3,227 MW non-coincident**

Baseline Assessment

Objective

- Evaluate projected transmission system performance to identify potential reliability criteria violations
- Propose system upgrades to resolve any violations and ensure NERC TPL, PJM, and DP&L reliability standards are met

NERC Reliability Criteria

- TPL-001-4 Transmission System Planning Performance Requirements

PJM Reliability Criteria

- Manual 14B
- www.pjm.com/planning/planning-criteria.aspx

DP&L Reliability Criteria

- **FERC 715 filing**
 - Updated criteria presented to Planning Committee in September 2019
 - <https://www.pjm.com/planning/planning-criteria/to-planning-criteria.aspx>
- **Facility Connection Requirements**
 - Configuration requirements further detailed in latest revision
 - Current split methodology changing in 2023, presented to Western TEAC in October 2020
 - Inverter Based Resource standard requirements further established in latest version
 - www.pjm.com/planning/design-engineering/to-tech-standards.aspx

Baseline Assessment

Process

- **Coordinate with PJM to identify and validate any potential reliability violations identified through PJM RTEP analysis and local assessment**
- **Baseline violations will be submitted to PJM in accordance with PJM's annual RTEP process**
- **PJM will review all validated violations at TEAC and/or Sub-regional RTEP Committees**
- **As required DP&L will submit Baseline upgrades to PJM according to PJM's annual open window processes**
- **All DP&L baseline proposals will be reviewed at PJM TEAC and/or Sub-regional RTEP Committees**
- **RTEP load flow cases will be made available through PJM, subject to PJM's NDA and CEII guidelines**

DP&L Transmission Projects

Supplemental Project Categories

- **New or upgraded customer delivery points**
 - Service to new and existing customers
 - System improvements to serve new and existing customers
- **Source for underlying distribution**
 - Distribution or customer load growth
 - Distribution circuit ties
- **System configuration improvements**
 - Elimination of three terminal lines and hard taps
 - Mitigation of non-standard switching arrangements that can impact system/customer reliability
 - Enhance system operational flexibility through switching enhancements
- **Operational Performance**
 - Address facilities with historical outage performance concerns
 - Facility material condition
 - System operating conditions

All needs and solutions will be reviewed at the sub-regional TEAC meeting for stakeholder input as part of the M-3 Process

DP&L End of Life

2021

DP&L

DP&L Lifecycle Asset Management – End of Life

Overview

- DP&L has developed an End of Life (EOL) Program pursuant to Attachment M-3 of the PJM Tariff.
- DP&L will utilize field equipment assessments through regular asset inspections, historical system performance, customer impacts, and real-time operational data to form the basis of our EOL program.
- The EOL program will function as part of DP&L's overall system lifecycle asset management program.
- The DP&L EOL program will specifically identify possible complete asset replacements for submittal to PJM in the form of an EOL Candidate List.
 - The EOL Candidate List will include PJM BES transmission lines & all transmission transformer assets requiring complete replacement within the 5-year window covered by the annual RTEP process.
- If a facility listed in the EOL Candidate List requires potential complete replacement as determined by DP&L engineering staff, it will be advanced forward as a Need in the M-3 Process.
- If there is an overlap between a DP&L EOL Candidate facility and a PJM/DP&L planning criteria violation as part of the RTEP evaluation, PJM and DP&L will work jointly to confirm a possible overlap and communicate the overlap to stakeholders as required.

Transmission Lines at End of Life

Transmission Line Evaluations

- **DP&L Inspection Programs** serve as a key input to the DP&L's overall lifecycle asset management program including EOL.
 - **Transmission Lines** will be inspected on a regular schedule based on the voltage of the line and the type of construction.
 - DP&L's program will include data from both ground inspections and aerial inspections from DP&L crews.
- **DP&L Performance Review**
 - The system performance review of the DP&L transmission system will be integrated into the overall lifecycle asset management program including EOL and may also serve as an input to the inspection program for poor performing circuits.
 - Facilities where condition issues are expected to be contributing to the underlying line performance will be prioritized as a feedback into the DP&L's Inspection Program.
 - Prioritizing inspections based upon known asset attributes including performance ensures assets are addressed prior to further degradation to system reliability and service to customers.
- **Typical Inspection Points**
 - Structure Condition
 - Grounding
 - Anchors and Guys
 - Joint Use
 - Insulators
 - Conductor and Static/Shield Wire
 - Structure Crossing
 - Clearance
 - Signage
 - Soil and Pavement
 - Right of Way Conditions
 - Lightning Arresters
 - Switches
 - Animal Damage
 - Vegetation
- Once a transmission line facility is placed on the EOL Candidate List based on the inspection points outlined above, DP&L engineering staff may consider the complete line condition, maintenance history, current design standards, performance, ability to do corrective maintenance, and other factors before the facility is advanced from the EOL Candidate List to a Need in the M-3 Process.

Transformers at End of Life

Transmission Transformer Evaluations

- **DP&L Inspection Programs** serve as a key input to the DP&L's overall life cycle asset management program including EOL.
 - **Transmission transformers will be inspected on a regular schedule based on the voltage of the transformer.**
- **DP&L Performance Review**
 - **The performance review of the transmission system may also serve as an input to the inspection program for poor performing and/or critical transformers, where asset condition could be an underlying issue.**
 - **This review will help identify facilities that may be failing between inspection cycles and doing prioritized inspections to ensure continued reliable service to customers.**
- **Typical Inspection Points**
 - **Physical Inspection**
 - **Oil Sampling**
 - **Dissolved Gas Analysis (DGA)**
 - **Doble Insulation Test**
 - **Through fault event analysis**
 - **Historical unit loading**
- **Once a facility is placed on the EOL Candidate List, DP&L engineering staff will review the complete transformer condition, operational performance, maintenance history, criticality, availability of replacement parts, availability of vendor technical support services, and the ability to do corrective maintenance before the facility is advanced from the Candidate List to a Need in the M-3 Process.**