AEP Transmission Local Planning Assumptions for PJM RTEP Baseline, Network, Supplemental and Asset Management Projects

PJM Sub-Regional RTEP

Western Meeting

December 11, 2026

Table of Contents

- Overview of AEP and AEP Zone
- Assumptions
- Models
- Overview of RTEP Projects
- Local Needs and FERC Form 715
    - Baseline and Network Projects
- Local Needs and Attachment M-3
    - Supplemental and Asset Management Projects
    - Planning Criteria for Supplemental and Asset Management Projects
    - Five types of criteria drivers, including Condition, Performance and Risk
        - Latter criteria drive End-Of-Life and Asset Management Needs
- Retirement of Existing Facilities

Overview of AEP

- AEP is among the largest electric utilities in the United States
  - More than 5 million customers
  - 200,000 + sq. mi. service territory
  - 32 GW of generating capacity
  - Over 40,000 miles of electric transmission lines
  - More than 3,500 substations
  - 215,000 miles of electric distribution lines
- Largest owner of electric transmission in the United States
  - Own, operate and maintain transmission facilities in 4 RTOs and 11 states
  - Interconnections with 60 major utilities across the U.S.
  - Supplying ~10% of demand in Eastern Interconnection and ~11% of demand in ERCOT

Overview of AEP Zone

- Total AEP Transmission facilities in PJM region: ~23,000 miles
  - 765 kV ~2,200 miles
  - 500 kV ~100 miles
  - 345 kV ~4,000 miles
  - 230 kV ~100 miles
  - 161 kV ~50 miles
  - 138 kV ~9,000 miles
  - Sub-T ~8,000 miles

- Connected demand expected in AEP Transmission Zone in PJM

	2032 Summer	2032/33 Winter
• Appalachian	6,780 MW	8,451 MW
• Indiana Michigan	9,811 MW	8,753 MW
• Kentucky	1,890 MW	2,208 MW
• Ohio	27,660 MW	26,960 MW
• **Total**	**46,141 MW**	**46,372 MW**

- AEP load in the RTEP base cases is scaled to PJM forecast.

Assumptions

- This entire slide deck constitutes and addresses the assumptions requirement outlined in Attachment M-3 to the PJM Tariff.

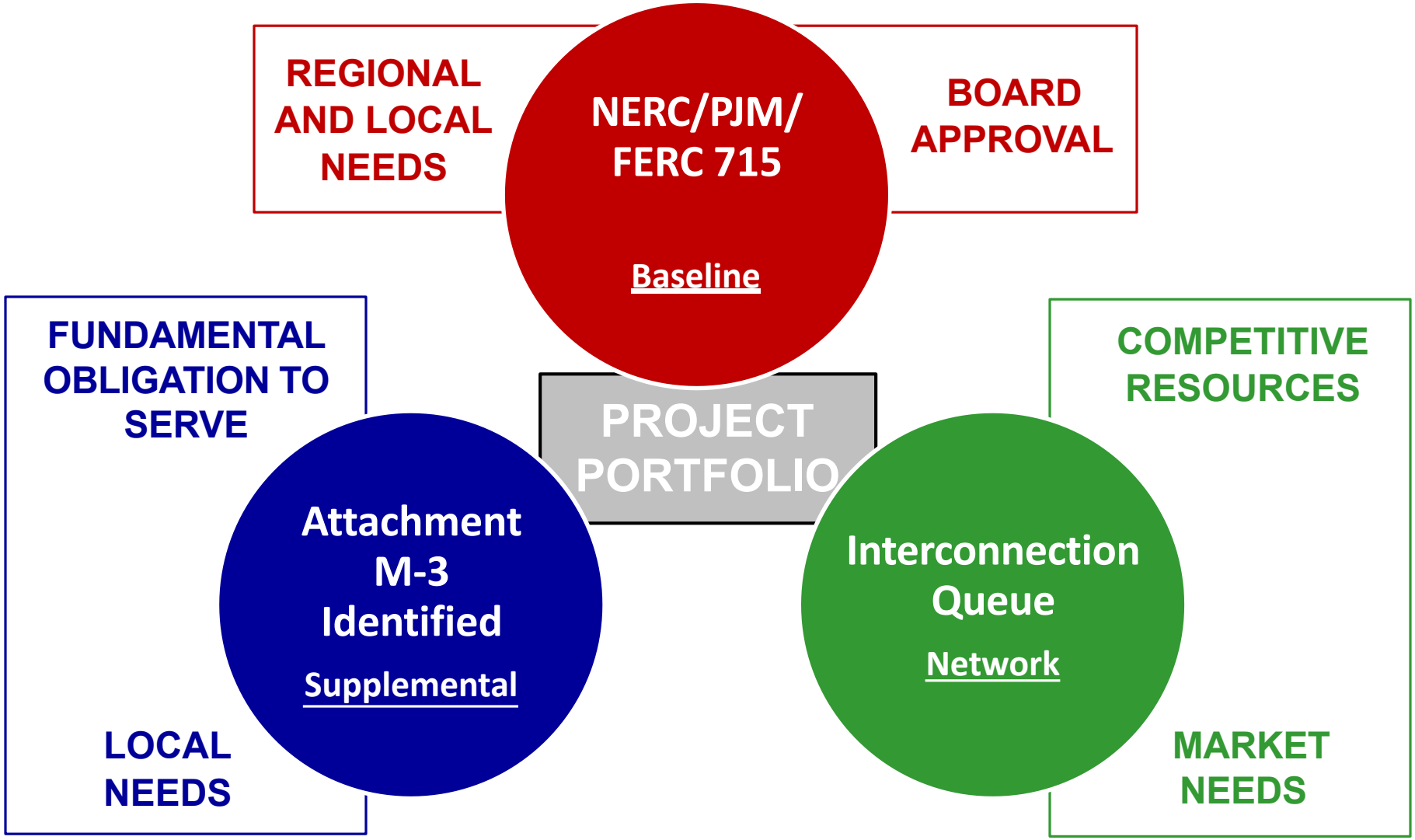
Models

- AEP supports development of and updates to RTEP base cases, including power flow, short circuit and stability.

- AEP participates in development of annual series of ERAG MMWG base cases.
  - Cases include seasonal, near-term, and long-term models used in ERAG and ReliabilityFirst assessments of the Transmission system.

- AEP planning studies utilize available PJM RTEP base cases.
  - AEP has both summer and winter peaking areas.
  - Internal cases are developed, on case by case basis as needed, to represent and address local historical constraints observed in real-time.

Overview of RTEP Projects



Local Needs and FERC Form 715

- Local Needs Driven by Local Planning Criteria in FERC Form 715
- Drive Baseline and Network Projects
- Address Needs that Lend Themselves to Bright-Line Criteria
  - For Example, Application of Requirements in TPL-001 to Sub-Transmission

Local Criteria and FERC Form 715

- AEP transmission system is planned in adherence with the PJM Planning Criteria that are comprised of NERC Reliability Standards, PJM Planning Procedures and Transmission Owner Planning Criteria in FERC Form 715.

- AEP Planning Criteria in FERC Form 715 align with NERC Reliability Standards and PJM Planning Procedures.
  - Includes criteria for planning non-BES transmission system (below 100 kV).

- All planning studies utilize the latest available PJM RTEP base cases.
  - Special cases are created to perform local area studies, as needed

- PJM evaluates compliance and adherence to above standards and criteria from regional perspective (top down), and AEP does the same from a local perspective (bottom up).

Link to AEP Transmission Planning Reliability Criteria in FERC Form 715:
https://www.aep.com/requiredpostings/AEPTransmissionStudies

Local Needs and Attachment M-3

- Local Needs Driven by Local Planning Criteria under Attachment M-3
- Drive Supplemental and Asset Management Projects
- Address Needs that Do Not Lend Themselves to Bright-Line Criteria
    - For Example, Application of Requirements Not Reflected in TPL-001

Local Criteria and Attachment M-3

- **Customer Service Criteria**
  Service to new and existing customers. Interconnect new customer load. Address distribution load growth, customer outage exposure, equipment loading.
- **Equipment Material Condition, Performance and Risk Criteria**
  Degraded equipment performance, material condition, obsolescence, including at the end of the useful life of equipment or a facility, equipment failure, employee and public safety and environmental impact.
- **Operational Flexibility and Efficiency Criteria**
  Optimizing system configuration, equipment duty cycles and restoration capability, minimize outages.
- **Infrastructure Resilience Criteria**
  Improve system ability to anticipate, absorb, adapt to, and/or rapidly recover from a potentially disruptive event, including severe weather, geo-magnetic disturbances.
- **Other Criteria**
  Meet objectives not included in other definitions such as, but not limited to, technological pilots, industry recommendations, environmental and safety impacts, etc.

Customer Service

- In accordance with NERC Standard FAC-001-2, AEP has posted requirements for interconnections of end-use customers, generators, and transmission facilities.
- To provide service to end-use customers, AEP performs studies to determine the system impacts and develop a plan of service for contracted load levels.
- AEP will use good engineering judgement to potentially enhance plans to serve projected load levels to account for flexibility around any future customer demand.
  - AEP consults with the customers as well as the local and state economic development organizations in assessing the likelihood of additional future demand.

Link to AEP Connection Requirements for the AEP Transmission System : https://www.aep.com/requiredpostings/AEPTransmissionStudies

Condition, Performance and Risk

- AEP guidelines for transmission owner identified needs address equipment material conditions, performance, and risk while considering infrastructure resilience, operational flexibility and efficiency, and other criteria needs.

- The AEP criteria and guidelines allow determination of asset needs which must be revitalized to ensure safe, reliable and cost-effective operation of the grid, and include those that address End-Of-Life needs in accordance with the provisions in Attachment M-3 of the PJM Tariff.

- AEP takes a holistic view of all the needs in developing solution options to best address the identified needs.

- AEP may also consider programmatic needs – for example, in 2019, AEP reviewed transmission needs that were addressed through the AEP Eastern System Pre-1930s Era Lattice Tower and Transmission Line System program.

Link to AEP Transmission Planning Criteria for End-Of-Life and Other Asset Management Needs: https://www.aep.com/requiredpostings/AEPTransmissionStudies

Operational Flexibility and Efficiency

- Optimize system configuration, equipment duty cycles and restoration capability.
- Minimize facility outages.
- Maximize system reliability through improved system restoration, equipment sectionalization, and system configuration.
- Removal and replacement of Special Protection Systems (SPS).
- Improve system reliability and safety by reducing operator interventions and actions.
- Enhance legacy facilities to modern engineering design standards.
  - Eliminate hard taps
  - Reduce multiple zones of protection
  - Loop radial facilities above a 75-MW/mile threshold
- Address safety hazards and reliability risks to system operations.

Infrastructure Resilience

- Improve system ability to anticipate, absorb, adapt to, and/or rapidly recover from a potentially disruptive events, including severe weather, geo-magnetic disturbances.
- Evaluate system strength and adaptability to reduce customer outages and disruptions from severe events.
- Mitigate risks across the system (reliability, safety, compliance, financial, etc.).
- Identify and reduce single points of failure.
- Harden grid against potential low-frequency, high-impact threats (physical, cyber, GMD, EMP, etc.).
- Optimize inventory of replacement facilities (spares, mobiles, etc.).

Other

- Meet objectives not included in previous four categories:
  - Customer Service
  - Equipment Material Condition, Performance & Risk
  - Operational Flexibility & Efficiency
  - Infrastructure Resilience

- Obligation to meet environmental requirements and needs.

- Address state, local, or other non-RTEP requirements, directives, and requests.

- Respond to requests from non-PJM public utilities and neighboring planning regional entities for supporting projects in PJM.

- Address reliability needs in anticipation of generation retirements.

- Support implementation of technological pilot projects.

- Ensure adherence to Good Utility Practice.

Baseline and Supplemental Solutions

- PJM has the responsibility of reviewing and approving any and all baseline solutions submitted in response to any PJM identified violations or any AEP identified 715 criteria violations.
- AEP has the responsibility to submit and review any and all needs and the solutions for those needs identified as part of the needs assessment outlined in the previous slides with PJM stakeholders.
- AEP submits solutions for baseline violations for consideration by PJM through the Order 1000 process so that PJM can determine the most cost effective solution for the identified baseline issues.
- Where a previously-reviewed supplemental project or need overlaps with baseline criteria violations, solutions are still submitted to PJM for review as part of the Order 1000 process as a potential solution to the baseline criteria violation.
- PJM holds the responsibility of determining the most holistic solution for any given criteria violation, taking into consideration any overlapping baseline and supplemental needs.
- Any supplemental need remaining after the designation of a baseline solution is complete will continue through the M-3 process for AEP to address with a separate supplemental project.
- After all solutions in a given area are identified, the AEP Project Management team will look for opportunities to combine work execution together to help reduce outage times and associated costs.

Retirement of Existing Facilities

- The purpose of transmission planning is to ensure that the capacity of the existing transmission system is maintained or expanded as needed to ensure the reliability, efficiency, safety, resilience and security of the transmission system for the benefit of customers.
- There are no national, regional or local standards or criteria driving the retirement and not replacement of existing facilities. Although in specific situations, facilities may be removed and not replaced as dictated by system and/or customer needs, or the design and construction of new or replacement transmission projects, decisions to not replace individual facilities may have the cumulative effect of negatively impacting the reliability, efficiency, safety, resilience and security of the transmission system. That cumulative negative impact could also drive the need for additional facilities to be constructed to compensate for those removed, including greenfield installations.
- Accordingly, existing facilities are maintained in service or retired based on Good Utility Practice.

Questions?