



AEP Local Plans 2016 RTEP Planning Process

PJM Sub-Regional RTEP Committee
Western Sub-Regional Meeting
January 28, 2016

Functional Control

1. PJM has functional control of Transmission facilities in AEP Transmission zone

2. Total AEP Transmission facilities: ~23,000 miles
 - a) 765 kV ~2,200 miles
 - b) 500 kV ~100 miles
 - c) 345 kV ~4,000 miles
 - d) 230 kV ~100 miles
 - e) 161 kV ~50 miles
 - f) 138 kV ~9,000 miles
 - g) Sub-T ~8,000 miles

AEP Connected Demand

1. Connected demand modeled in AEP Transmission zone

	<u>2021 Summer</u>	<u>2021/22 Winter</u>
a) Appalachian	6,447 MW	7,228 MW
b) Indiana Michigan	4,863 MW	4,321 MW
c) Kentucky	1,170 MW	1,401 MW
d) <u>Ohio</u>	<u>11,425 MW</u>	<u>10,127 MW</u>
Total	23,905 MW	23,077 MW

2. Since AEP Transmission zone has summer and winter peaking sub-zones, both summer and winter planning studies are conducted.
3. AEP load in the RTEP case is scaled to PJM forecast.

Power Flow Models

1. AEP supported development of 2021 Summer RTEP Base Case by PJM and updates (retool) to prior-year RTEP Base Cases; used by AEP
2. AEP supports development of annual series of ERAG MMWG Base Cases via RFC, including development of seasonal, near-term, and long-term study Base Cases used in ERAG and RFC assessments of Transmission system performance; also used by AEP
3. Above Base Cases are available via PJM or RFC

Baseline Projects (B-Series)

1. Projects to resolve reliability violations per following Reliability Standards and Criteria:
 - a) NERC Reliability Standards
 - b) PJM Transmission Planning Criteria
 - c) AEP Transmission Planning Criteria (filed under FERC Form 715 and posted on PJM & AEP websites)

http://www.aep.com/about/codeofconduct/OASIS/TransmissionStudies/GuideLines/10AEP_PJM_FERC_715_Final_part4.pdf

2. 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)

AEP Transmission Planning Criteria

NERC Contingency Category	Transmission Facilities		
	EHV Facilities	HV Facilities	Sub-T Facilities
A – System Normal	<p>Thermal: No facility may exceed its normal rating. Voltage: All station voltages must stay between 1.05 per unit and 0.95 per unit.</p>		
B1 – Single Generator B2 – Single Line B3 – Single Transformer	<p>Thermal: No facility may exceed its normal rating.</p>	<p>Thermal: No facility may exceed its emergency rating.</p> <p>Voltage: All station voltages must stay between 1.05 per unit and 0.92 per unit. A voltage change from system normal of 8% or greater is not acceptable at any station.</p>	
C1 – Bus C2 – Breaker Failure C5 – Double Circuit Tower	<p>Thermal: No facility may exceed its emergency rating. Voltage: All station voltages must stay between 1.05 per unit and 0.92 per unit. A voltage change from system normal of 8% or greater is not acceptable at any station.</p>		<p>Note: Not planned for this Category of contingencies.</p>
C3 – Two Category B Contingencies (one Category B contingency followed by another Category B contingency)	<p>Thermal: No facility may exceed its emergency rating. Voltage: All station voltages must stay between 1.05 per unit and 0.92 per unit. A voltage change from system normal of 8% or greater is not acceptable at any station. Manual System Adjustments After First Contingency: Not acceptable for transmission facilities supplying major load centers (as defined in FERC 715).</p>		<p>Note: Not planned for this Category of contingencies.</p>
D6 – Loss of Tower Line with 3 or More Circuits D7 – Loss of All Transmission Lines on Same Right of Way D8 – Loss of Substation D9 – Loss of Switching Station D10 – Loss of All Generating Units at a Station	<p>Note: Performance is evaluated for risks and consequences. Issues identified may not be mitigated, but may be used to screen viable solutions to resolve violations from Category B and C contingencies.</p>		<p>Note: Not planned for this Category of contingencies.</p>

- Difference between PJM and AEP Planning criteria highlighted in “red”.
- Contingency definitions will be updated in April 2016 FERC 715 filing to align with the new TPL standard.

AEP Transmission Planning Criteria

Similar to PJM's load deliverability assessment, AEP has incorporated sensitivity scenarios in the FERC 715 filing to adequately manage uncertainty inherent in the forecasting process:

- a) AEP does not plan its local Transmission System to withstand the sensitivity scenarios but in turn ensures that limitations under the base conditions and several sensitivity scenarios are addressed to achieve the greatest flexibility and the most optimal set of solutions.
- b) Sensitivity scenarios include credible conditions developed for varying load levels, generation dispatch, transfer conditions, status of pumping storage facilities, variability of intermittent resources, etc.

Network Projects (N-Series)

1. Projects to enable interconnection of queued Transmission customer projects (such as IPP)
2. Must meet same standards and requirements
 - a) NERC Reliability Standards
 - b) PJM Transmission Planning Criteria
 - c) AEP Transmission Planning Criteria (filed under FERC form 715 and posted on PJM & AEP websites)
3. PJM evaluates regional impacts, while AEP evaluates local impacts of queued projects; PJM sends consolidated reports to customers

Supplemental Projects (S-Series)

1. Projects not covered under previous series
2. Typically are transmission load connections
3. Must meet “Requirements for Connection of New Facilities or Changes to Existing Facilities Connected to the AEP Transmission System” posted on AEP’s website.

http://www.aep.com/about/codeofconduct/OASIS/TransmissionStudies/Requirements/AEP_Interconnection_Requirements_Rev1.pdf

4. Do not require approval by PJM Board
5. Reviewed in Sub-Regional & TEAC meetings

Questions ???