AEP Transmission
Local Planning Assumptions

PJM Sub-regional RTEP

Western Meeting

January 30, 2018

Introduction to AEP

- **AEP is among the largest electric utilities in the United States**
  - More than 5.4 million customers
  - 200,000 + sq. mi. service territory
  - 26 GW of generating capacity
  - Over 40,000 miles of electric transmission lines
  - More than 3500 substations
  - 224,000 miles of electric distribution lines

- **Largest owner of electric transmission in the United States**
  - Own, operate, and maintain transmission facilities in 3 RTOs and 11 states
  - Interconnection with 60 major utilities across the U.S.
  - Supplying ~10% of demand in Eastern Interconnection and ~11% of demand in ERCOT

AEP Zone in PJM

- 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 modeled in AEP Transmission zone in PJM

	2023 Summer	2023/24 Winter
Appalachian	6,082 MW	7,348 MW
Indiana Michigan	4,790 MW	4,032 MW
Kentucky	1,003 MW	1,279 MW
Ohio	11,033 MW	9,646 MW
Total	**22,908 MW**	**22,305 MW**

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

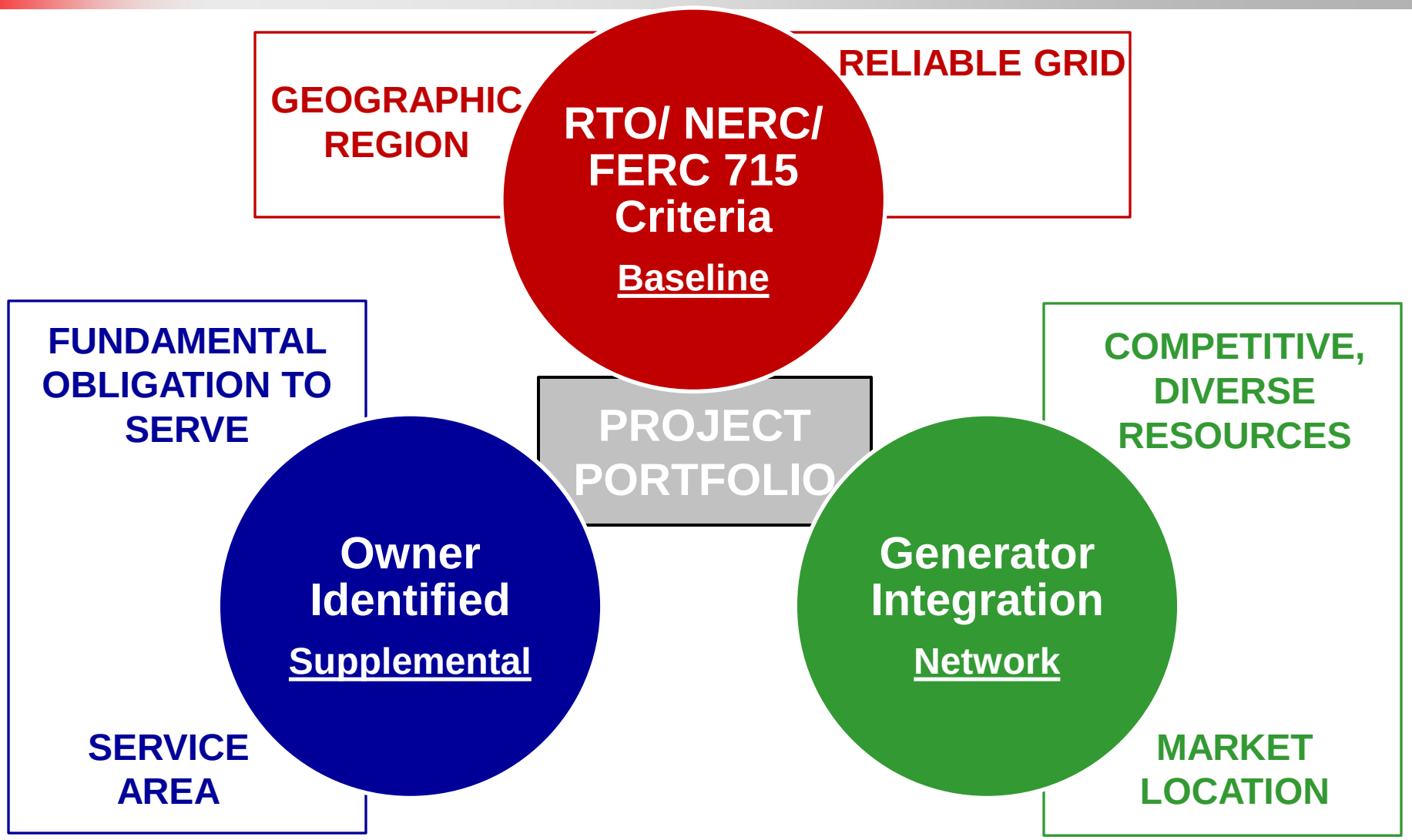
PJM Power Flow Models

- AEP supports development of and updates to RTEP cases.

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

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

Types of Projects in PJM Region



AEP Planning Criteria – FERC 715

- AEP transmission system is planned in adherence with NERC TPL-001-4 and PJM planning procedures outlined in Manual 14B.
- AEP Planning Criteria (FERC 715) complements the NERC and RTO planning procedures.
  - Includes criteria to plan non-BES system (below 100 kV).
- All planning studies utilize the latest available PJM RTEP cases.
- PJM evaluates compliance and adherence to above standards, procedures, and criteria from regional perspective (top down), and AEP does the same from a local perspective (bottom up).

Link to AEP FERC 715:
http://www.aep.com/about/codeofconduct/OASIS/TransmissionStudies/

Customer Interconnections

- 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 initial studies to determine the system impacts and develop a plan of service for contracted load levels.
  - Required transmission upgrades are validated by PJM under baseline reliability planning criteria.

- AEP may, at its discretion, develop plans to serve projected (non-contracted) load levels provided by customers in consultation with local and state economic development organizations.
  - Any required upgrades to meet projected loads are considered supplemental.

Link to AEP Interconnection Requirements:
http://www.aep.com/about/codeofconduct/OASIS/TransmissionStudies/

Guidelines for TO Identified Needs

- AEP has posted a document to outline guidelines for transmission owner identified needs that address equipment material conditions, performance, and risk while considering infrastructure resilience, operational flexibility and efficiency.

- The AEP guidelines allow AEP to determine which asset needs will be most impactful to overall grid performance and service to customers so that solutions can be identified within appropriate time frames.

- AEP then takes a holistic view of all the needs, developing solution options for consideration to best address the identified needs.

Link to AEP Guidelines for TO Identified Needs
http://www.aep.com/about/codeofconduct/OASIS/TransmissionStudies/