



# EKPC Local Planning Assumptions

November 2018

# East Kentucky Power Cooperative

- Generation & transmission cooperative serving mainly rural portions of eastern two-thirds of KY
- Total miles of transmission line = 2930 miles
  - 122 miles of 345 kV
  - 370 miles of 161 kV
  - 431 miles of 138 kV
  - 2007 miles of 69 kV
- EKPC forecasted net peak demand (50/50 probability)
  - 2019 Summer – 2341 MW
  - 2019-20 Winter – 3281 MW
  - 2024 Summer – 2483 MW
  - 2024-25 Winter – 3418 MW

# EKPC Project Identification Process

- EKPC identifies different categories of projects:
  - Planning criteria projects are baseline projects that address planning criteria violations which originate from internal analysis and/or PJM RTEP analysis.
  - Interconnection projects to provide facilities for connection of new generation, transmission, and/or distribution facilities
  - Supplemental projects are not covered by baseline analysis and address items such as, but not limited to: equipment condition, operational performance and flexibility, and outage history, among others.

# EKPC Planning Criteria

- EKPC provides information to PJM for the annual SERC LTSG DBU process
  - Develops near-term and long-term cases to be used by SERC NTSG and LTSG
  - This case set includes annual models for the ERAG MMWG base case development.
- EKPC presently jointly develops internal base cases with LGE/KU for internal studies
  - EKPC and LGE/KU have 54 free-flowing interconnections
  - EKPC has 56 distribution delivery points connected to the LGE/KU system (600+MW at peak)
  - LGE/KU has 17 distribution delivery points connected to the EKPC system (100+ MW at peak)
  - Load flow topology is based on the most recent MMWG modeling efforts extended to include both the EKPC and LGE/KU respective area topology updates since the creation of the MMWG models.
    - All EKPC future projects are modeled as in service.

# EKPC Planning Criteria (cont.)

- EKPC plans its system to meet:
  - NERC reliability standards requirements
  - SERC regional criteria
  - PJM planning criteria
  - EKPC transmission planning criteria – posted on PJM website
- EKPC planning criteria is similar to Table I of the existing NERC TPL Standards in most respects
  - EKPC considers the loss of a line, transformer, or generator in conjunction with the loss of a generator to be a single-contingency (P1) event.
  - EKPC planning criteria is posted at <https://www.pjm.com/planning/planning-criteria/to-planning-criteria.aspx>

# EKPC Planning Criteria (cont.)

- EKPC uses the following assumptions:
  - EKPC developed load forecast based on 1 in 2 coincident individual substation peak demands (summer and winter) forecasted on a normal weather basis.
  - Base case generation assumptions – EKPC generators are dispatched as needed to meet EKPC load based on economic merit order.
  - EKPC uses the generation dispatch scenarios below during annual planning analysis. These generation dispatch scenarios, when coupled with a contingency, are assumed to create the worst case power flow condition.

Generation Outage	Replacement Generation Imported From
Big Sandy	South
Brown 3	North
Brown 3	South
Cooper 1&2	North
Cooper 1&2	South
Ghent 1	South
JK Smith 9 & 10	North
JK Smith 9 & 10	South
Mill Creek 4	South
Spurlock 2	South
Trimble 2	South

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# Supplemental Projects

- Supplemental Projects – EKPC supplemental projects are identified based on the following drivers:
  - Equipment Material Condition, Performance and Risk
  - Operational Flexibility and Efficiency
  - Customer Service
  - Infrastructure Resilience
  - Other

# Supplemental Projects – Equipment Material Condition, Performance and Risk

- Equipment Material Condition, Performance and Risk projects are identified to address degraded equipment performance, material condition, obsolescence, equipment failure, safety and environmental impact.
- Project drivers include:
  - Safety
  - Transmission infrastructure replacements based on condition, obsolescence, or equipment that has reached its end of life
  - Environmental drivers
  - Other



# Supplemental Projects – Operational Flexibility and Efficiency

- Operational Flexibility and Efficiency projects are identified to optimize system configuration, equipment duty cycles, and restoration capabilities and to minimize outages.
  - Project drivers include:
    - Enhancing system functionality, flexibility, or operability
    - Recurring real time equipment overloads
    - PCLLRW frequency
    - Number of outages and annual outage duration
    - Load exposure

# Supplemental Projects – Customer Service

- Customer service projects are identified to address customer outage exposure, equipment loading, load growth or to interconnect new customer load.
  - Project drivers include:
    - Member System Needs
      - Identified based on Member System requirements for service to end-use customers
    - SAIDI, CAIDI, number of outages and annual outage durations
    - New customer connections

# Supplemental Projects – Infrastructure Resilience

- Infrastructure Resilience projects improve the system's ability to anticipate, absorb, adapt to, and/or rapidly recover from a potentially disruptive event, including severe weather, geo-magnetic disturbances or physical and cyber security challenges.
- Project drivers include:
  - Network existing radial facilities
  - Building new 69kV for future higher voltage conversion and eliminate 69kV in dense load pockets
  - Adding redundant facilities
  - Infrastructure hardening (additional physical/cyber security, replacement of equipment, etc.)
  - Other

# Supplemental Projects – Other

- These projects would address concerns not discussed in the other definitions.
- Project drivers include:
  - Industry recommendations
  - Potential generation retirements
  - Technological pilot projects
  - Other

# EKPC Project Approval Process

- EKPC has a Capital Management Committee (CMC)
  - Members include all levels of leadership at the Manager level and above in the Power Delivery business unit.
  - Process starts with a problem to be addressed.
    - SME Team develops solution projects (alternatives) to address the identified problem.
    - All solution projects and the recommended solution are presented to the CMC.
    - CMC reviews solutions and approves projects.
  - All projects are approved by the CMC, COO, CEO and the EKPC Board.

# EKPC/PJM Coordination and RTEP

- EKPC will share its assessment results with PJM
- EKPC will work with PJM to develop appropriate upgrades/mitigation plans for identified planning criteria violations
- EKPC will coordinate with PJM to present identified needs, potential solutions, and recommended projects at the PJM sub-regional RTEP meetings and TEAC meetings as necessary to consider stakeholder needs and potential solutions.



# APPENDIX



## **Retirement of Existing Facilities – Statement**

**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.**