

# FE East (Mid-Atlantic) Local Planning Assumptions For 2017

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# FE – PJM Partnership

- FE performs separate analysis from PJM on it's zonal areas
- PJM and FE perform analysis consistent with NERC and RF planning requirements
- PJM focus is to apply PJM criteria (Manual 14B: Attachment D)
- FE focus is to apply:
  - FE Facility Connection Requirements
  - FE Transmission Planning Criteria
- Net result is the validation of each other's assessments to assure planning criteria violations are real and then propose upgrades in accordance with the PJM process for ultimate stakeholder review.

# FE Facility Connection Requirements

- Detailed connection requirements established for connection of any generation or load to the FE transmission system
- Required to ensure no degradation to the reliable operation and to facilitate maintenance of the transmission system
- Ideally, the outage of any major piece of substation equipment can be scheduled for maintenance without disrupting the transmission system.
- **[www.firstenergycorp.com/feconnect](http://www.firstenergycorp.com/feconnect)**



# FE Transmission Planning Criteria

- Intended to meet or exceed all applicable minimum requirements of the North American Electric Reliability Corporation (NERC), ReliabilityFirst (RF) and PJM
- Applicable to FirstEnergy owned Bulk Transmission and Transmission (non Bulk) facilities
- Addresses loadability criteria, voltage level criteria, voltage and transient stability requirements, load curtailment criteria, voltage regulation requirements, reactive power requirements and short circuit requirements.
- Bulk Transmission level voltages are 100kV and above.
- Transmission (non Bulk) level voltages for networked systems range from 34.5 kV to 100kV as defined by zonal area.
- <http://www.pjm.com/planning/planning-criteria.aspx>

# FE “Maintenance Condition” Contingency Analysis

- At Spring/Fall forecasted peak.
- Analysis of N-1 contingencies with any one transmission element (line section or transformer) out of service due to maintenance.
- To ensure the ability to take equipment out for maintenance for an extended period of time.



# Setting Loads in System Models

- The loads in the system models are established using three sources:
  - FE Operating company distribution substations, and retail transmission connected customer substations, use FE Internal Load Forecast Data Management System (LFDMS)
  - Wholesale customer substations (eg Rural Electric Cooperatives and municipals) are also forecasted in LFDMS, utilizing forecasted information provided by the customers
  - Overall system forecasted loads are provided by the FE Retail Tariff Analysis & Forecasting group

# Building the Model

- The base FE models are updated annually and use a 50/50 load forecast
- The updated FE system model is inserted into the latest available model from NERC/RF MMWG
- A 90/10 load forecast sensitivity case as well as other sensitivity cases (eg base generating unit outages) are used to assess constraints and robustness of solutions
- FE will provide the base model used in developing it's local plans to PJM consistent with any applicable confidentiality restrictions, PJM's CEII process and copyright limitations.

# Proposed Transmission Projects

- Projects based on the FE Energizing the Future (EtF) Program
  - PJM RTEP (Criteria Driven) requirements
  - FE Reliability Enhancement (Reliability Driven) methodology
- FE will follow the established PJM stakeholder process including participation in the TEAC and/or Subregional RTEP meetings as well as established internal stakeholder discussions as necessary.
- FE will consider stakeholder feedback/suggestions received at these meetings prior to finalizing it's local plans.

# Transmission Planning Process

**As a member of PJM, FirstEnergy actively participates in the Regional Transmission Expansion Plan (RTEP) process to identify future transmission system additions and improvements.**

Future transmission system additions and improvements are based on:

- Coordinated Planning/Protection studies between PJM and FirstEnergy
- Ensuring compliance with applicable reliability standards and planning/protection requirements established by NERC, ReliabilityFirst, PJM and FirstEnergy
- Projects and/or solutions necessary to mitigate identified planning criteria violations on the FirstEnergy system
- Study results and connection requirements for new load and new generation connections

# Transmission Reliability Enhancement Process

The Reliability Enhancement (RE) process identifies future transmission projects that:

- Reduce the duration and frequency of unscheduled outages
- Upgrade the condition of equipment
- Modernize the infrastructure
- Enhance system performance
- Improve operational flexibility, resiliency, and situational awareness
- Increase/restore load serving capability
- Address IT Network system reliability, obsolescence, compliance & security
- Maintain/enhance cyber and physical security

**Future transmission system projects are identified for consideration based on EtF Project/Program methodology**