PSE&G Assumptions Overview

ELECTRIC DELIVERY PLANNING

November 2018

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Base Case Models

- Base Case Model will includes PSE&G 69kV network
- PJM RTEP models shall be for assessments of RTEP years
- Multi-regional Modeling Working Group (MMWG) 2018 series models for years where no PJM case is available, consistent with methodology in PJM Manual 14B.
- RTEP projects will be modeled consistent with PJM MOD-032 Model Data Requirements and Procedures Section 2.1.

Baseline Planning Criteria

- Both PSE&G and PJM study PSE&G's system to identify the need for baseline reliability upgrades using the following:

- NERC Reliability Standards
  - Applied to all BES facilities
  - TPL-001
    http://www.nerc.com/files/TPL-001-4.pdf

- PJM Regional Transmission Planning Process: Manual 14B
  http://www.pjm.com/~/media/documents/manuals/m14b.ashx

- PSE&G Planning Criteria
  - Detailed in FERC 715 filing
    https://www.pjm.com/library/request-access/ferc-form-715/private-ferc-form-715.aspx

System Load

- Summer and winter peaks loads will be consistent with the load levels shown in the 2019 PJM Load Forecast Report for regional level analyses.

- PSE&G local area analyses use PSE&G non-coincident substation/customer peak loads
- Shoulder-season load modeling follows convention detailed in the Eastern Interconnection Reliability Assessment Group MMWG Procedural Manual
  https://www.rfirst.org/ProgramAreas/RAPA/ERAG/MMWG/ERAG%20%20MMWG%20Library/MMWG%20Procedural%20Manual%20V20.pdf

- Localized area re-dispatch
- Light Load Studies at 35% of that year's Summer Peak

PSE&G Supplemental Drivers

Driver	Definition
Equipment Material Condition, Performance and Risk	Degraded equipment performance, material condition, obsolescence, equipment failure, employee and public safety and environmental impact.
Operational Flexibility and Efficiency	Optimizing system configuration, equipment duty cycles and restoration capability, minimize outages.
Infrastructure Resilience	Improve system ability to anticipate, absorb, adapt to, and/or rapidly recover from a potentially disruptive event, including severe weather, geo-magnetic disturbances, physical and cyber security challenges, critical infrastructure reduction.
Customer Service	Service to new and existing customers. Interconnect new customer load. Address distribution load growth, customer outage exposure, equipment loading.
Other	Meet objectives not included in other definitions.

PSE&G Supplemental Drivers
Equipment Material Condition, Performance and Risk

Equipment Material Condition, Performance and Risk

Degraded equipment performance, material condition, obsolescence, equipment failure, employee and public safety and environmental impact.

- Equipment Reliability and Condition Assessment
  - Frequency and duration of historical outages/events
  - Inspection & test results
  - Historical maintenance costs
  - Equipment age & number of operations
  - Equipment criticality & critical customers
  - Availability of replacements/spares & restoration times
- Asset Risk Model
  - Consequence of Failure
    - Safety Impact – Risk of direct harm to personnel or the public as a result of asset failure.
    - Reliability Impact – Replacement availability, restoration time, and restoration complexity.
    - Customer Impact – Customer type, load, and number of customers served by an asset.
    - Environmental Impact – The impact to the environment associated with an asset failure.
  - Likelihood of Failure
    - Survivor Curves
    - Effective Asset Age – Condition assessment & expected service life.

PSE&G Supplemental Drivers
Operational Flexibility and Efficiency

Operational Flexibility and Efficiency

Optimizing system configuration, equipment duty cycles and restoration capability, minimize outages.

- Baseline Violations for Non-Tariffed Transmission Voltage Facilities
  - Thermal & Voltage Violations
  - N-1-1 Load Drop Violations
  - PSE&G FERC 715 Criteria violations
- System Standardization
  - Modernize legacy system to meet current standards
  - Engineering directives & guidelines (both internal and external)

PSE&G Supplemental Drivers
Infrastructure Resilience

Infrastructure Resilience

Improve system ability to anticipate, absorb, adapt to, and/or rapidly recover from a potentially disruptive event, including severe weather, geo-magnetic disturbances, physical and cyber security challenges, critical infrastructure reduction.

- Supply Diversification
  - Reduce single points of failure
  - Mitigate effects of significant event at single facility
  - Provide backup for load pockets
- Storm Hardening & Flood Mitigation
  - FEMA Flood Elevation
  - Flood Hazard Area Limits
  - Outages due to historical storm events

PSE&G Supplemental Drivers
Customer Service

Customer Service

Service to new and existing customers. Interconnect new customer load. Address distribution load growth, customer outage exposure, equipment loading.

- Localized Load Growth & Contingency Overloads
  - Increased capacity requirements for new load
  - Contingency overloads at existing stations
- Customer Substations
  - Address customer requests
  - Maintain system reliability for interconnections

PSE&G Supplemental Drivers
Other

Other

Meet objectives not included in other definitions.

- Environmental & Safety Impacts
- New Technologies
- Distributed Energy Resource System Impacts
  - Voltage impacts due to DERs
  - Frequency market energy storage impacts
  - Backfeed through station transformers
  - Ride-through issues and concerns

APPENDIX

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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.