Review of 2020 RTEP Assumptions Update

Transmission Expansion Advisory Committee

February 4, 2020

Overview

- 2020 RTEP
  - TPL-001-4
- Modeling
  - MOD-032 (GOs and TOs)
    - http://pjm.com/planning/rtep-development/powerflow-cases/mod-032.aspx
    - Siemens PSS®MOD - Model On Demand (TOs)
    - PJM.com Planning Center Online Tool (Gen Model) – GOs
- RTEP Proposal Windows
  - Includes FERC Form 715 violations

(No change from January presentation)

- Load Flow Modeling
  - Power flow models for outside world load, capacity, and topology will be based on the following 2019 Series MMWG power flow cases
    - 2019 Series 2024SUM MMWG outside world for
      - 2020 Series 2025SUM RTEP, 2023SUM RTEP
    - 2019 Series 2024SLL MMWG outside world for
      - 2020 Series 2025LL RTEP
    - 2019 Series 2024WIN MMWG outside world for
      - 2020 Series 2025WIN RTEP
  - PJM to work with neighbors to identify any updates to topology/corrections
  - PJM topology for all cases sourced from Model On Demand
    - Include all PJM Board approved upgrades through the December 2019 PJM Board of Manager approvals as well as all anticipated February 2020 PJM Board approvals

(No change from January presentation)

Locational Deliverability Areas (LDAs)

- Includes the existing 27 LDAs
- Total of 27 LDAs
  - All 27 to be evaluated for the as part of the 2020 RTEP

LDA	Description
EMAAC	Global area - PJM 500, JCPL, PECO, PSEG, AE, DPL, RECO
SWMAAC	Global area - BGE and PEPCO
MAAC	Global area - PJM 500, Penelec, Meted, JCPL, PPL, PECO, PSEG, BGE, Pepco, AE, DPL, UGI, RECO
PPL	PPL & UGI
PJM WEST	APS, AEP, Dayton, DUQ, Comed, ATSI, DEO&K, EKPC, Cleveland, OVEC
WMAAC	PJM 500, Penelec, Meted, PPL, UGI
PENELEC	Pennsylvania Electric
METED	Metropolitan Edison
JCPL	Jersey Central Power and Light
PECO	PECO
PSEG	Public Service Electric and Gas
BGE	Baltimore Gas and Electric
PEPCO	Potomac Electric Power Company
AE	Atlantic City Electric
DPL	Delmarva Power and Light
DPLSOUTH	Southern Portion of DPL
PSNORTH	Northern Portion of PSEG
VAP	Dominion Virginia Power
APS	Allegheny Power
AEP	American Electric Power
DAYTON	Dayton Power and Light
DLCO	Duquesne Light Company
Comed	Commonwealth Edison
ATSI	American Transmission Systems, Incorporated
DEO&K	Duke Energy Ohio and Kentucky
EKPC	Eastern Kentucky Power Cooperative
Cleveland	Cleveland Area

(No change from January presentation)

- Firm Commitments
  - Long term firm transmission service consistent with those coordinated between PJM and other Planning Coordinators during the 2019 Series MMWG development
- Outage Rates
  - Generation outage rates will be based on the most recent Reserve Requirement Study (RRS) performed by PJM
  - Generation outage rates for future PJM units will be estimated based on class average rates

(No change from January presentation)

Generator Deliverability: Generic EEFORds

- Generic EEFORd values developed for 2025 RTEP base case
- Capacity weighted by fuel type
  - Each unit within a given generator class is assigned the average EEFORd for that class

Gen Class	MW	Avg EEFORD
Fossil Steam	59,695	10.48%
Nuclear	30,939	1.49%
Combustion Turbine	26,440	8.45%
Combined Cycle	68,233	4.44%
Hydro	2,904	7.48%
Pumped Storage	5,609	3.16%
Diesel	982	12.62%
Wind	1,765	0.00%
Solar	3,186	0.00%

(Table updated)

2020 RTEP Load Modeling

- Summer Peak Load
  - Summer Peak Load will be modeled consistent with the 2020 PJM Load Forecast Report
  - The final load forecast released in December 2019
- Winter Peak Load
  - Winter Peak Load will be modeled consistent with the 2020 PJM Load Forecast Report
- Light Load
  - Modeled at 50% of the Peak Load forecast per M14B
  - The Light Load Reliability Criteria case will be modeled consistent with the procedure defined in M14B
- Load Management, where applicable, will be modeled consistent with the 2020 Load Forecast Report
  - Used in LDA under study in load deliverability analysis

(No change from January presentation)

2020 RTEP Generation Assumptions

- All existing generation expected to be in service for the year being studied will be modeled.
- Future generation with a signed Interconnection Service Agreement, or that cleared in the 2020/21 BRA, will be modeled along with any associated network upgrades.
  - Generation with a signed ISA will contribute to and be allowed to back-off problems.
- Generation with an executed Facilities Study Agreement (FSA) will be modeled offline and will be examined separately.

(No change from January presentation)

2020 RTEP Generation Assumptions

- Generation with an FSA will be modeled consistent with the procedures noted in Manual 14B
- Generation with an executed FSA will be modeled offline but will be allowed to contribute to problems in the long-term generation deliverability testing.
  - Generation with an executed FSA will not be allowed to back-off problems.
- Additional generation information (i.e. machine lists) will be posted to the TEAC page.

(No change from January presentation)

Queue Project NOT Included in 2020 Series RTEP Cases

- Queue projects with an FSA or ISA but are not included in 2020 Series RTEP cases
  - Y3-092 (MTX)
    - 1000 MW Capacity Transmission Injection Rights
    - 500 MW Firm Transmission Withdrawal Rights and 500 MW Non-Firm Transmission Withdrawal Rights

(No change from January presentation)

Deactivation Notification Generation

- Generation that has officially notified PJM of deactivation will be modeled offline in RTEP base cases for all study years after the intended deactivation date
- RTEP baseline upgrades associated with generation deactivations will be modeled
- Retired units Capacity Interconnection Rights are maintained in RTEP base cases for 1 year after deactivation at which point they will be removed unless claimed by an interconnection queue project

(No change from January presentation)

- At a minimum, all PJM bulk electric system facilities, all tie lines to neighboring systems and all lower voltage facilities operated by PJM will be monitored.
- At a minimum, contingency analysis will include all bulk electric system facilities, all tie lines to neighboring systems and all lower voltage facilities operated by PJM.
- Thermal and voltage limits will be consistent with those used in operations and those specified in the Form 715 planning criteria. In all cases, the more conservative value will be used.

(No change from January presentation)

- PJM/NYISO Interface
  - B & C cables will be modeled out of service consistent with NYISO modeling
- Linden VFT
  - Modeled at 330 MW
- HTP
  - Modeled at 0 MW

(No change from January presentation)

24 Month RTEP

- As part of the 24-month RTEP cycle, a year 8 (2028) base case will be developed and evaluated as needed as part of the 2020 RTEP
- The year 8 case will be based on the 2025 Summer case that will be developed as part of this year's 2020 RTEP
  - The case will be updated to be consistent with the 2020 RTEP assumptions.
- Purpose: To identify and develop longer lead time transmission upgrades

(No change from January presentation)

FERC 1000 Process

- Similar to the 2019 RTEP and per the PJM Operating Agreement, a proposal window will be conducted for all reliability needs that are not Immediate Need reliability upgrades or are otherwise ineligible to go through the window process.
- FERC 1000 implementation will be similar to the 2019 RTEP.
  - Advance notice and posting of potential violations
  - Advance notice of window openings
  - Window administration

(No change from January presentation)

- Request stakeholder suggestions for and input to 2020 alternative sensitivity studies and scenario analysis
  - No input received by the time the materials were posted

(Added sentence)

Revision History

V1 – 12/31/2019 – Original Slides Posted

V2 – 1/30/2020 – Updated Generator Deliverability Generic EEFORds with 2020 values on slide #6

– Added a sentence to slide #16: 2020 Scenario Analysis