Review of 2019 RTEP Assumptions Update

Transmission Expansion Advisory Committee

January 10, 2019

Overview

- Update of standard RTEP assumptions
- 2019 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

2019 RTEP Assumptions

- Load Flow Modeling
  - Power flow models for outside world load, capacity, and topology will be based on the following 2018 Series MMWG power flow cases
    - 2018 Series 2023SUM MMWG outside world for
      - 2019 Series 2024SUM RTEP, 2022SUM RTEP
    - 2018 Series 2023SLL MMWG outside world for
      - 2019 Series 2024LL RTEP
    - 2018 Series 2023WIN MMWG outside world for
      - 2019 Series 2024WIN 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 2018 PJM Board of Manager approvals as well as all anticipated February 2019 PJM Board approvals
  - OVEC will be included as a part of PJM

Locational Deliverability Areas (LDAs)

- Includes the existing 27 LDAs

- Total of 27 LDAs
  - All 27 to be evaluated for the 2022/2023 delivery year RPM base residual auction planning parameters

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

2019 RTEP Assumptions

- Firm Commitments
  - Long term firm transmission service consistent with those coordinated between PJM and other Planning Coordinators during the 2018 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

Generator Deliverability: Generic EEFORds

- Generic EEFORd values developed for 2024 RTEP base case
  - To be posted with TEAC materials
- 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	68,658	7.99%
Nuclear	28,798	1.83%
Combustion Turbine	24,801	8.91%
Combined Cycle	54,835	4.03%
Hydro	2,911	7.04%
Pumped Storage	5,575	4.05%
Diesel	1,064	12.04%
Wind*	2,025	0.00%
Solar*	1,282	0.00%

* No change for wind and solar

(2018 values – Will be updated in February 2019)

2019 RTEP Load Modeling

- Summer Peak Load
  - Summer Peak Load will be modeled consistent with the 2019 PJM Load Forecast Report
  - The final load forecast released in December 2018

- Winter Peak Load
  - Winter Peak Load will be modeled consistent with the 2019 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 2019 Load Forecast Report
  - Used in LDA under study in load deliverability analysis
  - Include Demand Response (DR) based on what cleared in the 2021/22 BRA

2019 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 2021/22 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 along with any associated network upgrades, which will be examined separately.

2019 RTEP Generation Assumptions

- Generation with an FSA will be modeled consistent with the procedures noted in Manual 14B
  - Exceptions to those procedures will be vetted with stakeholders at a future TEAC

- Generation with an executed FSA will be modeled offline but will be allowed to contribute to problems in the 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.

Queue Project NOT Included in 2019 Series RTEP Cases

- Queue projects with an FSA or ISA but are not included in 2019 Series RTEP cases
  - X3-028 (MTX)
    - 2000 non-firm and 1500 firm
  - Y3-092 (MTX)
    - 500 non-firm and 500 firm

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

2019 RTEP Assumptions

- 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.

2019 RTEP Assumptions

- 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

24 Month RTEP

- As part of the 24-month RTEP cycle, a year 7 (2026) base case will be developed and evaluated as part of the 2019 RTEP

- The year 7 case will be based on the 2024 Summer case that will be developed as part of this year's 2019 RTEP
  - The case will be updated to be consistent with the 2019 RTEP assumptions.

- Purpose: To identify and develop longer lead time transmission upgrades

FERC 1000 Process

- Similar to the 2018 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 2018 RTEP.
  - Advance notice and posting of potential violations
  - Advance notice of window openings
  - Window administration

2019 Scenario Analysis

- Request stakeholder suggestions for and input to 2019 alternative sensitivity studies and scenario analysis

Revision History

V1 – 1/4/2019 – Original Slides Posted