Review of 2022 RTEP Assumptions Update

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Overview

- 2022 RTEP
  - TPL-001-5.1
- 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

Expected Timeline

- November 2021: Establish 2022 RTEP base case modeling assumptions
  November 2021 to February 2022: Build base cases and perform initial case review. During this period,
  - New modeling and other basic assumption changes will not be considered unless PJM determines they may have a significant impact on the RTEP baseline studies.
  - Corrections to the analytical files will be accepted.
- February to May 2022: Perform RTEP baseline studies.
  - No new modeling or other basic assumption changes anticipated
  - Corrections to the analytical files will only be accepted if they have a widespread impact or will likely impact one or more identified violations.

Expected Timeline

- June/July 2022
  - Open competitive proposal window
  - Post modeling assumptions changes and corrections for and begin mid-year retool of 2022 RTEP baseline analysis if required
    - Accounts for major new modeling assumption changes and corrections not previously considered.
    - Basic assumptions such as planning criteria and ratings methodology that changed after February will not be considered until the 2023 RTEP.
- July/August 2022
  - Close competitive proposal window
  - Finalize mid-year retool
- August to December 2022: Evaluate proposals
- October 2022 to February 2023: Approve proposals

- Load Flow Modeling
  - Power flow models for outside world load, capacity, and topology will be based on the following 2021 Series MMWG power flow cases
    - 2026SUM MMWG outside world for 2022 Series 2027SUM RTEP, 2025SUM RTEP
    - 2026SLL MMWG outside world for 2022 Series 2027LL RTEP
    - 2026WIN MMWG outside world for 2022 Series 2027WIN RTEP, 2025WIN RTEP
    - 2023SUM MMWG outside world for 2022 Series 2023SUM 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 2021 PJM Board of Manager approvals as well as all anticipated February 2022 PJM Board approvals
    - Include all Supplemental Projects included in 2021 Local Plan

2022 RTEP Assumptions

- Firm Commitments
  - Long term firm transmission service consistent with those coordinated between PJM and other Planning Coordinators during the 2021 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 2027 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	Avg EEFORD
Fossil Steam	8.42%
Nuclear	1.28%
Combustion Turbine	6.17%
Combined Cycle	2.62%
Hydro	8.29%
Pumped Storage	2.81%
Diesel	12.19%
Wind	0.00%
Solar	0.00%
Battery	5.00%

2022 RTEP Load Modeling

- Summer Peak Load
  - Summer Peak Load will be modeled consistent with the 2022 PJM Load Forecast Report
  - The final load forecast released in December 2021
- Winter Peak Load
  - Winter Peak Load will be modeled consistent with the 2022 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 2022 Load Forecast Report
  - Used in LDA under study in load deliverability analysis

2022 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 2022/23 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 FSA will be modeled consistent with the procedures noted in Manual 14B, is not expected to be required to meet target generation levels through the planning horizon, and therefore will not be considered in the RTEP analysis.
- Additional generation information (i.e. machine lists) will be posted to the TEAC page.

Queue Project NOT Included in 2022 Series RTEP Cases

- Queue projects with an FSA or ISA but are not included in 2022 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

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 queue project

- 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.

2022 RTEP Assumptions

- PJM/NYISO Interface
  - B & C cables will be modeled out of service consistent with 2021 RTEP
- Linden VFT
  - Modeled at 330 MW
- HTP
  - Modeled at 0 MW
- Transource 9A project
  - Not included in model

24 Month RTEP

- As part of the 24-month RTEP cycle, a year 8 (2030) base case will be developed and evaluated as needed as part of the 2022 RTEP
- The year 8 case will be based on the 2027 Summer case that will be developed as part of this year's 2022 RTEP
- Purpose: To identify and develop longer lead time transmission upgrades

FERC 1000 Process

- Similar to the 2021 RTEP and per the PJM Operating Agreement, a proposal window will be conducted for all reliability needs that are not certain Immediate Need reliability upgrades or are otherwise ineligible to go through the window process.
- FERC 1000 implementation will be similar to the 2021 RTEP.
  - Advance notice and posting of potential violations
  - Advance notice of window openings
  - Window administration

Locational Deliverability Areas (LDAs)

- Includes the existing 27 LDAs
- Total of 27 LDAs
  - All 27 to be evaluated for the as part of the 2022 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

2022 Scenario Analysis

- Request stakeholder suggestions for and input to 2022 alternative sensitivity studies and scenario analysis
- PJM participating in DOE Atlantic Offshore Wind Transmission study which may provide additional information for 2023 RTEP and beyond
- PJM System Planning is working to outline a scope for looking at a low carbon future to discuss in RTEP scenario discussions later in 2022 or early 2023

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2022 RTEP Assumptions

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Revision History

Version No.	Date	Description
1	2/2/2022	• Original slides posted

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