



PJM's current Long-Term Reliability Planning Process and the need to clarify assumptions

Asanga Perera & Jonathan Kern
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- Performed annually as part of RTEP
- Covers years 6 through 15 to examine need for long-lead time transmission solutions
 - New 230 kV or 345 kV circuits required to support load growth in years 6 through 8
 - Right-of-way acquisition required for any new 230 kV or 345 kV circuits required to support load growth in years 9 and 10
 - New circuits 500 kV or greater identified as required to support load growth in years 6 through 12
 - Right-of-way acquisition required for any new 500 kV circuits required to support load growth in years 13 through 15

- 24-month planning cycle to more fully evaluate any needs
 - In Year 1, an 8 year base case is created and evaluated
 - In Year 2, a 7 year base case is created and evaluated
- Generator and load deliverability
 - 230 kV and up
 - Single and tower contingencies only
 - Ignore terminal equipment limitations
- DFAX extrapolation to year 15
 - Load growth for each zone according to PJM Load Forecast
 - Generation expands uniformly across the PJM footprint, i.e., same resources as in 5 year RTEP
 - No additional resource retirements and replacements



Example : Long-Term Planning DFAX Extrapolation

Table 1. Zonal distribution factors on Line A-B & zonal load growth from Year 5 through Year 15

Zone	DFAX*											
	Line A-B	Yr 5	Yr 6	Yr 7	Yr 8	Yr 9	Yr 10	Yr 11	Yr 12	Yr 13	Yr 14	Yr 15
X	5.0%	100	100	100	100	100	100	100	100	100	100	100
Y	3.0%	200	200	200	200	200	200	200	200	200	200	200
Z	-1.0%	50	50	50	50	50	50	50	50	50	50	50

* DFAX calculated on Year 5 RTEP base case using all online PJM generation as the source and each zone's bus loads as the sink

Table 2. Line A-B loading increase from Years 5 through Year 15

Line	Rating											
	(MVA)	Yr 5	Yr 6	Yr 7	Yr 8	Yr 9	Yr 10	Yr 11	Yr 12	Yr 13	Yr 14	Yr 15
A-B	3500	98.0%	98.3%	98.6%	98.9%	99.2%	99.5%	99.8%	100.1%	100.4%	100.7%	101.0%

- As necessary, a 10 year base case and evaluation is performed and evaluated to examine bulk system voltage issues to determine possible acceleration of any longer lead time thermal solutions identified in years 6-15
 - Includes TO reactive plans for year 10
 - Focuses on ≥ 345 kV contingencies and bus voltages
 - Primary focus is on areas where longer lead time thermal solutions have been identified in years 6-15

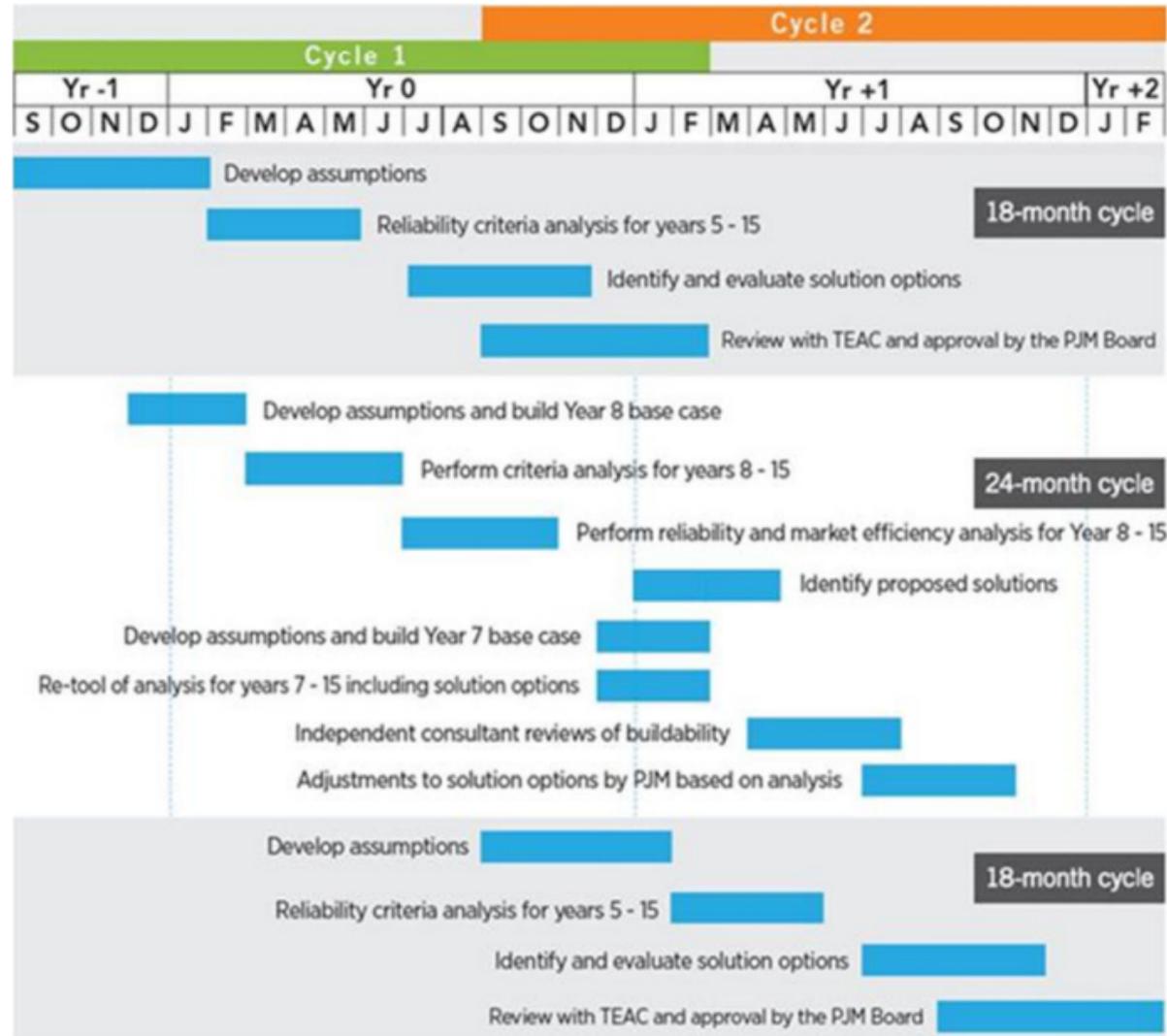


Exhibit 1: 24-Month Reliability Planning Cycle

- Current Long-Term Reliability Planning process assumes load growth, it assumes resource mix is fixed at the 5 year planning horizon
- Load growth continues to be an important focus
 - Data Center Load growth and electrification growth is expected
- Modeling assumptions must also consider changes in the resource mix
 - Resource retirements and replacements



Long-Term Reliability Planning – Need to clarify Assumptions

- PJM and the entire industry are in an energy transition
 - Decarbonization objectives are pursued at the Federal and State Level
 - Ensuring a reliable transition is important
- Fossil resource retirements are occurring at a rapid pace
 - In Q1 2023, PJM received 3,500 MW of retirement requests
 - In its Resource Retirements, Replacements and Risks paper, PJM identified the potential for 40,000 MW of retirements between 2022 and 2030
- Resource retirements should not be limited to near-term announcements
 - Considering expected retirements is necessary to ensure reliability



Long-Term Reliability Planning – Need to clarify Assumptions

- Resources that are replacing retirements are primarily renewables and storage
 - >95% of the Queue consists of renewable and storage resources
- Uniformly scaling generation to meet load growth assumptions no longer make sense
 - Assumes that replacements come primarily from fossil resources
- Both resource retirement and resource replacement (to replace resource retirements) assumptions have to be considered to ensure a reliable energy transition

- PJM's Long-Term Planning Process focuses on years 6 thru 15
- This Process is designed to develop long-lead transmission solutions
- Current Process assumes load growth but resource mix is fixed at the 5 year planning horizon and scaled uniformly to meet load
- PJM and the rest of the industry is in an energy transition
- Resource mix assumptions must be clarified to maintain reliability

SME/Presenter:

Asanga Perera

Asanga.Perera@pjm.com

Jonathan Kern

Jonathan.Kern@pjm.com

Facilitation Team:

Bhavana Keshavamurthy (Facilitator)

Bhavana.Keshavamurthy@pjm.com

Julia Spatafore (Secretary)

Julia.Spatafore@pjm.com



Member Hotline

(610) 666 – 8980

(866) 400 – 8980

custsvc@pjm.com

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1	7/18/2023	<ul style="list-style-type: none">• Original slides posted.
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