
	<u>PROCEDURE Title / Name</u> NEETMA-IN IP-Asset Management Strategy	
	<u>FUNCTIONAL OWNER</u> NEXTERA ENERGY TRANSMISSION MIDATLANTIC INDIANA	
	<u>CONTACT</u> NEET DIRECTOR OF OPERATIONS	<u>EFFECTIVE DATE</u> 10/21/2020

Contents

Purpose.....	2
Asset Management Strategy	2
End-of-Life Drivers	2
Transmission Line End of Life	5
NEET MidAtlantic IN Planning Criteria	7
Annual Approval.....	7
Appendix A: Transmission Asset Review	8

	<u>PROCEDURE Title / Name</u> NEETMA-IN IP-Asset Management Strategy	
	<u>FUNCTIONAL OWNER</u> NEXTERA ENERGY TRANSMISSION MIDATLANTIC INDIANA	
	<u>CONTACT</u> NEET DIRECTOR OF OPERATIONS	<u>EFFECTIVE DATE</u> 10/21/2020

PURPOSE

NEET MidAtlantic IN asset strategy provides the framework for managing the health, performance, costs and risks of transmission assets owned by NEET MidAtlantic IN. This is achieved through ensuring the sustainment of critical assets, including transmission lines and other facilities to meet reliability and availability requirements; and that changes to NEET MidAtlantic IN assets provide the needed transmission capacity and flexibility into the future. Through an assessment of the current state of NEET MidAtlantic IN's assets this strategy represents the course of action needed to ensure achieving the end-state goals.


ASSET MANAGEMENT STRATEGY

The strategy aligns key processes across the entire transmission asset lifecycle to NEET MidAtlantic IN higher-level strategies and values which is guided by performance goals, covers an extended time horizon, draws from economics as well as engineering, and considers a broad range of assets.

The strategy provides for:

- the economic assessment of tradeoffs between alternative actions and investment strategies from the system-level perspective and at the same time, allows for the more complete comparative analysis of options for individual projects
- the examination of all costs to minimize the life-cycle costs of asset ownership, while maintaining required service levels and sustaining the bulk electric system
- the consistent documentation of processes and procedures. All decisions can be related to and support the NextEra's goals, policies and the enterprise risks, including a balance workload and resources
- emphasis on monitoring the condition of assets and their performance, so that resources can be better allocated to where they provide the greatest benefits.
- sustaining the NextEra infrastructure both near- term (maintenance-oriented) and over the long-term (refurbishment-and Management-oriented) planning horizon to understand infrastructure needs and to fund them properly, considering all potential costs and benefits

END-OF-LIFE DRIVERS

	<u>PROCEDURE Title / Name</u> NEETMA-IN IP-Asset Management Strategy	
	<u>FUNCTIONAL OWNER</u> NEXTERA ENERGY TRANSMISSION MIDATLANTIC INDIANA	
	<u>CONTACT</u> NEET DIRECTOR OF OPERATIONS	<u>EFFECTIVE DATE</u> 10/21/2020

NEET MidAtlantic IN facilities can be improved by rebuilding, reconditioning, and/or replacing transmission lines where appropriate. NEET MidAtlantic IN will review and assess existing facilities for equipment characteristics that are near or beyond their existing service life or contain components or designs that are obsolete.


The following drivers are a key to optimizing the life cycle of NEET MidAtlantic IN transmission assets to ensure their safe, reliable operation and system resilience. The goal is to limit the impact from planned and forced events and facilitate restoration times by bringing systems up to current and evolving standards and design principles.

Equipment material condition performance and risk including:

- degraded equipment performance
- material condition
- obsolescence
- component failure
- employee and public safety
- environmental impact
- regulatory changes
- programmatic replacement and/or standardization
- environmental drivers

Operational flexibility and efficiency by:

- optimizing system configuration
- safe and reliable equipment duty cycles
- restoration capability
- minimizing outages
- adherence to facility interconnection requirements
- increasing system capacity
- design and operational ratings

	<u>PROCEDURE Title / Name</u> NEETMA-IN IP-Asset Management Strategy	
	<u>FUNCTIONAL OWNER</u> NEXTERA ENERGY TRANSMISSION MIDATLANTIC INDIANA	
	<u>CONTACT</u> NEET DIRECTOR OF OPERATIONS	<u>EFFECTIVE DATE</u> 10/21/2020

Infrastructure resilience including:

- Improved system ability to anticipate, absorb, adapt to, and recover from a potentially disruptive events, including:
 - hardening for severe weather
 - rapid restoration of service (spares, special tools and equipment)
 - geo-magnetic disturbances
 - electromagnetic pulses
 - physical and cyber security challenges
 - critical infrastructure reduction

Transmission customer service by:


- addressing new customer interconnections or modifications including generation and load growth, outage exposure and equipment loading
- building to support future economic growth

Other drivers to meet objectives not included in other definitions including:

- industry recommendations and adhering to good utility practices
- potential generation retirements
- technology pilot projects
- governmental and utility commission regulations
- material, staffing, and outage constraints

Multiple drivers linked to NEET MidAtlantic IN other asset management goals including:

- Assessment of system infrastructure performance focusing on facilities serving major urban areas that include more than one of the following drivers:
 - Load growth, including electrification initiatives

	<u>PROCEDURE Title / Name</u> NEETMA-IN IP-Asset Management Strategy	
	<u>FUNCTIONAL OWNER</u> NEXTERA ENERGY TRANSMISSION MIDATLANTIC INDIANA	
	<u>CONTACT</u> NEET DIRECTOR OF OPERATIONS	<u>EFFECTIVE DATE</u> 10/21/2020

- Reliability, where large sections of older transmission infrastructure serving heavily populated areas
- Resiliency, risk assessment of the impacts of multiple simultaneous facility outages
- Obsolescence, equipment no longer supported by manufactures and out of date technologies

TRANSMISSION LINE END OF LIFE


The life of transmission line assets will be directly related to life limiting factors affecting its sub-components. In many cases these subcomponents will receive an enhanced maintenance in order to allow the line to achieve its anticipated life.

NEET MidAtlantic IN may consider a proactive age-based approach to project solutions. NEET MidAtlantic IN considers the industry typical service life's for transmission line components within the PJM territory to be the following ranges:

- Steel structures 40-60 years
- Conductors 50-60 years
- Connectors 40-60 years
- Insulators (porcelain/glass) 50 years+
- Insulators (polymer) 30 years
- Fiber 30 years

Designers and manufactures have little control over how equipment is treated. Life expectancy is affected to a large extent by how well the equipment is installed, how the equipment is operated, and the environment in which it is operated, as well as how the equipment is maintained. It is only with this understanding that determining the service life for a specific line is possible. Many of these variables are discussed above (see End-Of-Life Divers) and combine with the assets ongoing condition assessment, which is often the best determinant of end of service life.

Equipment failure rates towards the end and beyond their industry service life are known to increase exponentially. Significant deterioration may result in frequent and extended outages, significant economic losses, and/or endanger public safety. Recognizing transmission line components age at different rates and

	<u>PROCEDURE Title / Name</u> NEETMA-IN IP-Asset Management Strategy	
	<u>FUNCTIONAL OWNER</u> NEXTERA ENERGY TRANSMISSION MIDATLANTIC INDIANA	
	<u>CONTACT</u> NEET DIRECTOR OF OPERATIONS	<u>EFFECTIVE DATE</u> 10/21/2020

have different typical industry service lives, individual project solutions may include consolidated projects, resulting in acceleration or delay.


Right of Way (ROW)

The NEET MidAtlantic IN ROW strategy covers corridors that contain transmission lines and maintenance access roads. It ensures ROW's are safely and legally accessible to transmission paths and remote sites and environmental regulations. Three components are included in the strategy that enable NEET MidAtlantic IN to safety access, construct, operate and maintain its transmission facilities. Each component is managed by a different group within NextEra Energy:

- Vegetation management ensures the clearing and maintenance of land within the transmission corridors, in accordance with the NextEra vegetation management program manual. NEET MidAtlantic IN implements an integrated vegetation management approach for managing plant communities. The choice of control methods is based on the environmental impact and anticipated effectiveness along with site characteristics, security, economics, current land use and other factors. NEET MidAtlantic IN vegetation strategy assures the highest level of regulatory compliance by adopting the integrated vegetation management approach, which is considered an industry best practice.
- Access roads are managed by the NEET MidAtlantic IN field operation team in accordance with local agencies requirements and landowner agreements to ensure safe access in compliance with environmental regulations. The field operations team implements a systematic long-term method for upgrading and maintaining access to and through ROW corridors. This allows a corridor approach for planning work in support of maintenance programs.
- NextEra Land Management acquire and manage all land rights in accordance with local agencies, tribal rights and easement stakeholders to meet NEET MidAtlantic IN targets including prioritizing the needs for land rights driven by a comprehensive view of the: alternative routes; risk of complaints; litigation; trespass violations; criticality of the line; tribal renewals

Steel Lines

NEET MidAtlantic IN will perform periodic condition assessments to evaluate the health of the steel lines. Based on the results of the assessment, NEET MidAtlantic IN will develop an actionable plan for any needed remediation and a long-term strategy for continual mitigation.

	<u>PROCEDURE Title / Name</u> NEETMA-IN IP-Asset Management Strategy	
	<u>FUNCTIONAL OWNER</u> NEXTERA ENERGY TRANSMISSION MIDATLANTIC INDIANA	
	<u>CONTACT</u> NEET DIRECTOR OF OPERATIONS	<u>EFFECTIVE DATE</u> 10/21/2020

NEET MIDATLANTIC IN PLANNING CRITERIA


On an annual basis, NEET MidAtlantic IN will conduct a planning assessment to identify the need for baseline reliability upgrades in adherence to:

- NERC planning criteria
- PJM planning criteria outlined in manual 14B
- NEET's FERC Form 715 criteria

ANNUAL APPROVAL

The *NEET MidAtlantic IN Asset Management Strategy* shall be reviewed and updated annually, if necessary.

<i>Version Number</i>	<i>Description of Change</i>	<i>Revised by</i>	<i>Approver</i>
0.0	Document creation.	J. Alligan	J. Chaney

	<u>PROCEDURE Title / Name</u> NEETMA-IN IP-Asset Management Strategy	
	<u>FUNCTIONAL OWNER</u> NEXTERA ENERGY TRANSMISSION MIDATLANTIC INDIANA	
	<u>CONTACT</u> NEET DIRECTOR OF OPERATIONS	<u>EFFECTIVE DATE</u> 10/21/2020

APPENDIX A: TRANSMISSION ASSET REVIEW

Assets

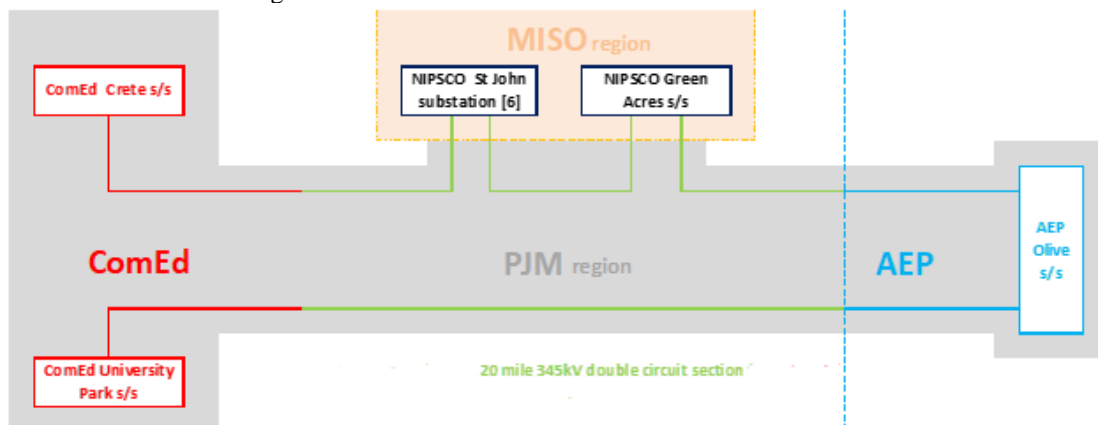
NEET MidAtlantic IN 345kV transmission line assets are:

- L97008 the University Park (ComEd IL) to Olive (AEP) 345kV Line (South circuit)
- L94507 the Crete Energy Park (ComEd IL) to St. John (NIPSCO) 345kV Line (North circuit)
- L6617 the Green Acres (NIPSCO) to St John (NIPSCO) 345kV Line (North circuit)
- L6615 the Green Acres (NIPSCO) to Olive (AEP) 345kV Line (North circuit)


The total length of this 345kV double circuit is approximately 20 miles and was originally place in service in 1958.

Project Single Line

NEET assets are shown in green.



Findings

	<u>PROCEDURE Title / Name</u> NEETMA-IN IP-Asset Management Strategy	
	<u>FUNCTIONAL OWNER</u> NEXTERA ENERGY TRANSMISSION MIDATLANTIC INDIANA	
	<u>CONTACT</u> NEET DIRECTOR OF OPERATIONS	<u>EFFECTIVE DATE</u> 10/21/2020

- NEET MidAtlantic IN transmission line assets are over 62 years old and most of the components appear to be from the original installation
- While this line may continue to be safe and reliable, its age of operation is in a life range where component significant unreliability is expected as its structures, conductor, insulators and hardware are of the same vintage and over 62 years old
- Existing assets are in the accelerated deterioration phase of their life, where failures increase dramatically creating unacceptable risk and/or uneconomic cost to repair
- Many of the insulators and associated hardware have shown signs of general wear-out
- The existing paper expanded conductor is obsolete and no longer available
- Increased maintenance and testing should be performed to reveal any unseen or undetected imminent end of life issues
- Current and future system conditions, methodology, or other factors may result in a review and change to operational ratings
- The ability to maintain capacity to existing standards may result in reconductoring, rebuilding, and/or replacement of the transmission line assets
- Grillage Foundations do not have cathodic protection and underground deterioration may lead to structure failures
- Replacing the lattice towers with single pole concrete structures will reduce the footprint of the structures
- Overall, most of the ROW is accessible and the structures are deemed acceptable with some minor surface rust