2024 10-Year Assessment Preliminary Needs

Stakeholder and Customer Webcast

PRESENTED BY:

System Planning, ATC

March 11, 2024

Purpose

- Define and Solicit Input on Needs
  - Network/System Planning
  - Generation Interconnection/Generation to Transmission (G-T) and Distribution to Transmission (D-T)
  - Asset Renewal
  - Communications
- Solicit Input on Public Policy Driven Needs
- Summarize Next Steps

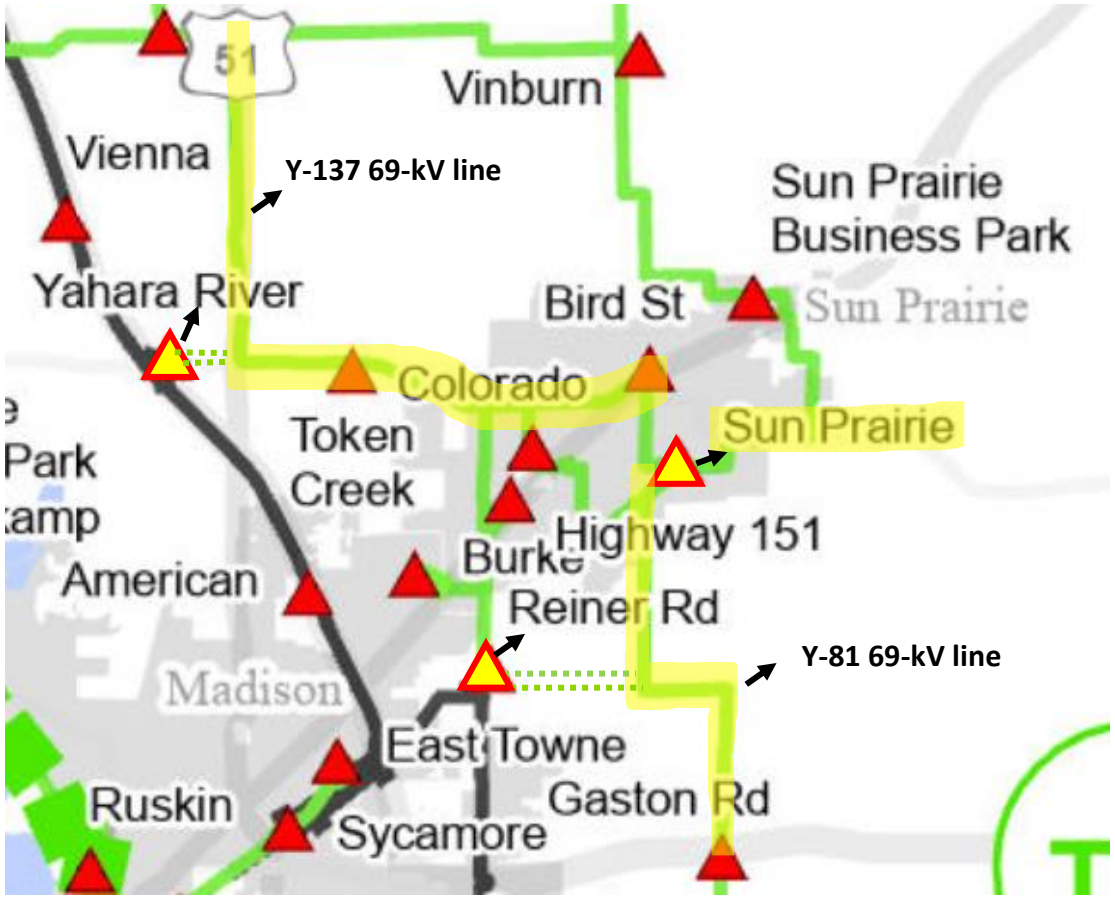
Preliminary Needs

- We are seeing new projects based on new needs this year.
  - New network reliability projects
  - Additional renewable interconnections & generation retirements
  - Distributed Energy Resources (DERs)
  - Substation and T-line asset renewal work
  - Changes in regulatory body priorities & policies

7 Mile Creek – Saratoga, new 138 kV line

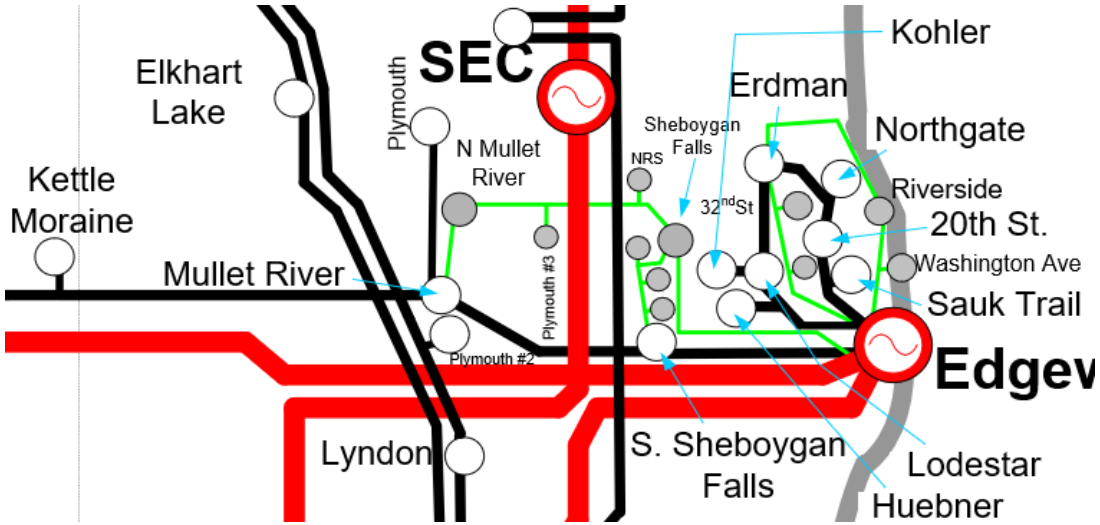
- Multiple system conditions causing congestions.
- Add a 138kV line between Saratoga and 7 Mile Creek by rebuilding a portion of Y-301 as double circuit 138 kV / 69 kV
- MTEP24, Target App A

Sun Prairie Area Reliability Project



- N-1-1 contingencies causing thermal limitations
  - Y-81 Loop-In-Loop-Out configuration in Reiner Road SS
  - Y-137 Loop-In-Loop-Out configuration in Yahara River SS
  - Sun Prairie SS, Jumper Replacements
  - Other Asset Renewal needs
- Target Appendix B, MTEP24

Mullet River Area Reliability Project



- Multiple N-1-1 contingencies causing thermal and voltage limitations
  - Existing mitigation radializes load
- Asset renewal needs and space constraints at existing sites
- Target Appendix A, MTEP24

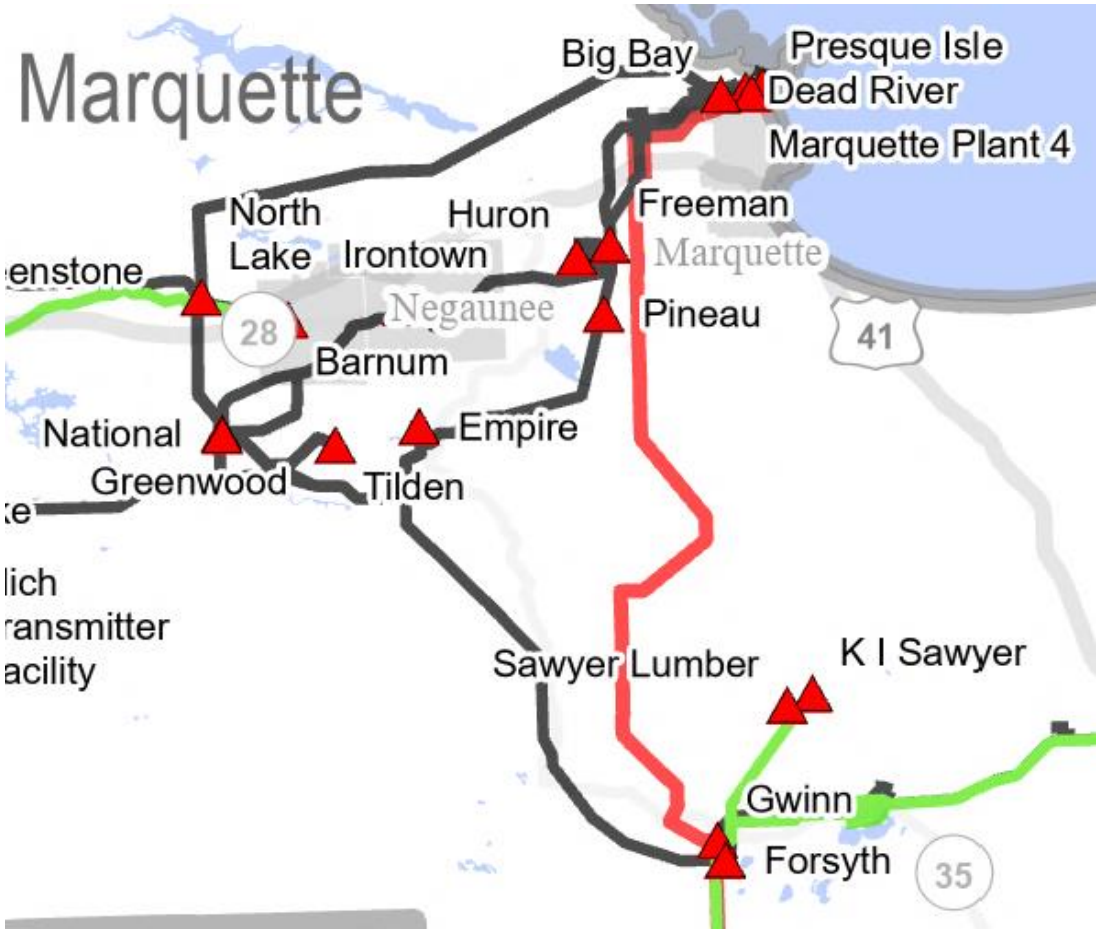
Y-77 High Falls – Mountain 69 kV Rebuild

- Long radial connection that traverses through Nicolet National Forest
- 1960's vintage wood pole structures are in lower condition, OPGW for backup communications and future flexibility.
- Rebuild line and install OPGW approximately 16.5 miles from High Falls to Mountain Substation
- Appendix A, MTEP23

Y-74 Hilltop-Council Creek 69kV Rebuild

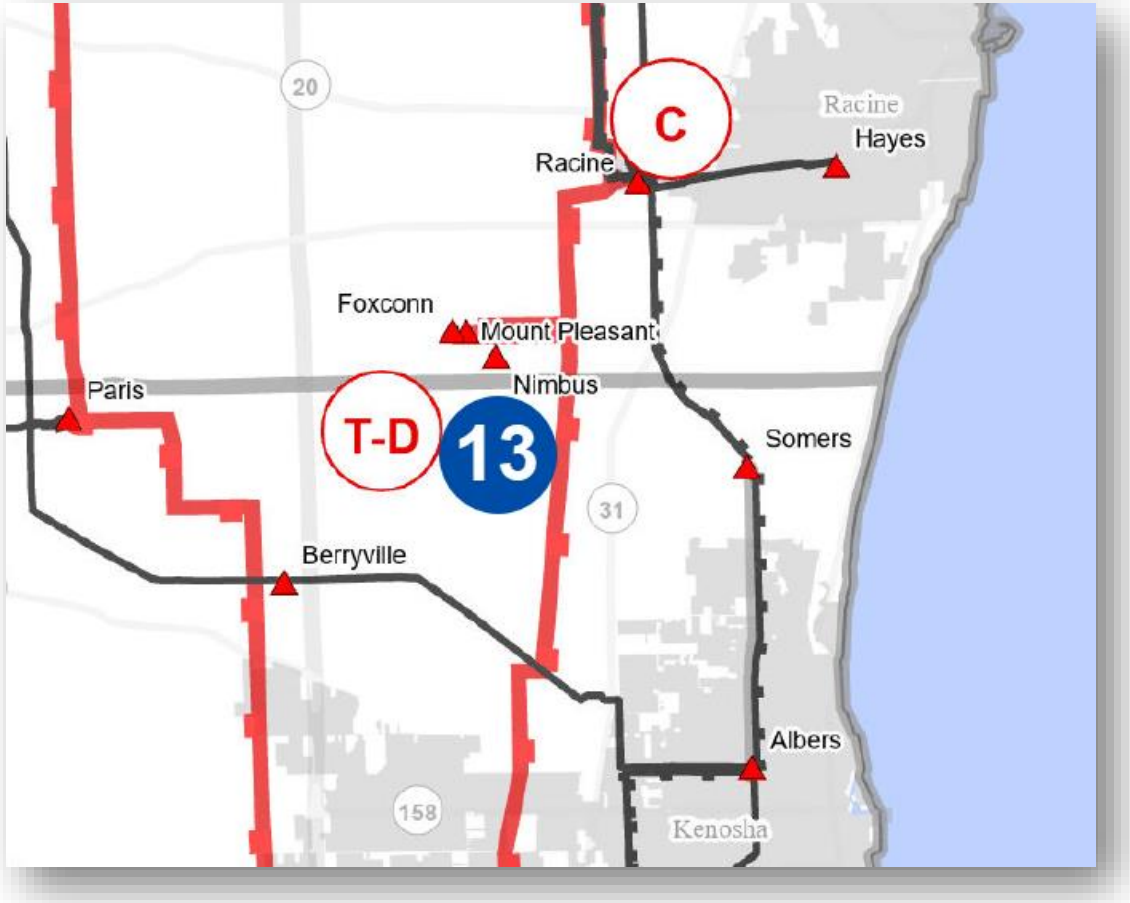
- 1960's single circuit wood pole line that is in lower condition. Other benefit of connecting fiber into ATC larger fiber network.
- rebuild and install OPGW on approximately 29.5 miles
  - Coordination of work at Camp Douglas and New Lisbon
- Target Appendix B, MTEP24

Presque Isle Asset Renewal Project



- Oil Circuit Breakers part of program for removal, relays and switches at equipment end of useful life.
- Reconfigure station equipment, install new breakers, relays, and switches.
- Target Appendix B, MTEP24

Racine County, DIC, New Substation



- New load interconnection request in the SE Wisconsin
- ISD targeting Q2 2025
- Project scope:
  - New 138/24.9 kV Interconnection Nimbus Substation
  - Two short 138 kV double-circuit transmission lines (<1.0 miles)
  - Expansion of the Mt. Pleasant Substation
  - New FACTS device at Mt. Pleasant
  - Scope may be expanded to support the future buildout of the EITM zone
- ATC will request MISO's Expedited Project Review (EPR) Process to include this project in MTEP24 App A

Communications Reliability Program (CRP) Projects - 2024 & Beyond

- **Challenges, Trends & Opportunities**
  - Telecom Carrier Performance & Service Challenges
  - Future Substation Technology & Communication Demands
  - T-Line Asset Management & System Planning Alignment

Distribution to Transmission (D-T) Interconnections

120 requests in 2023

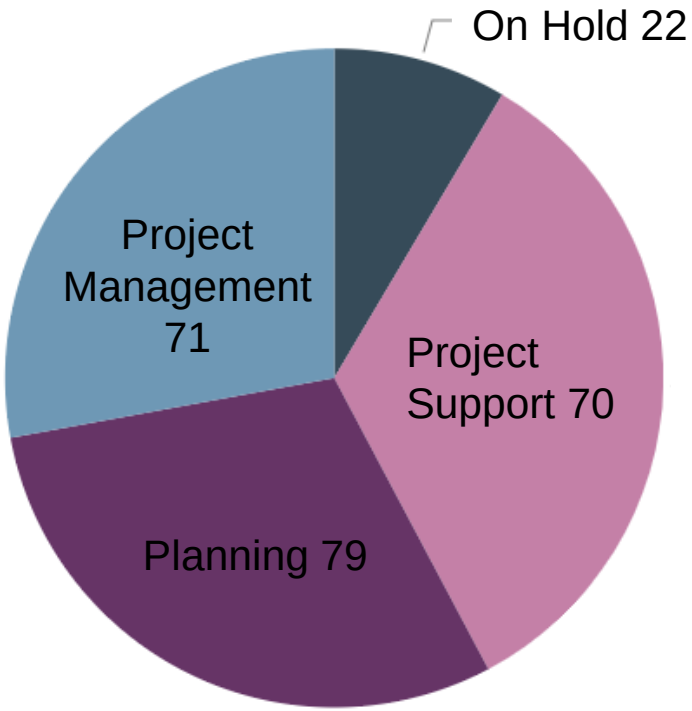
- Governing documents:
  - FERC Tariff Attachment FF-ATCLLC
  - NERC Standards
  - FERC Filed D-T Interconnection Agreement (IA)
  - ATC's Load Interconnection Guide
  - ATC's Business Practices

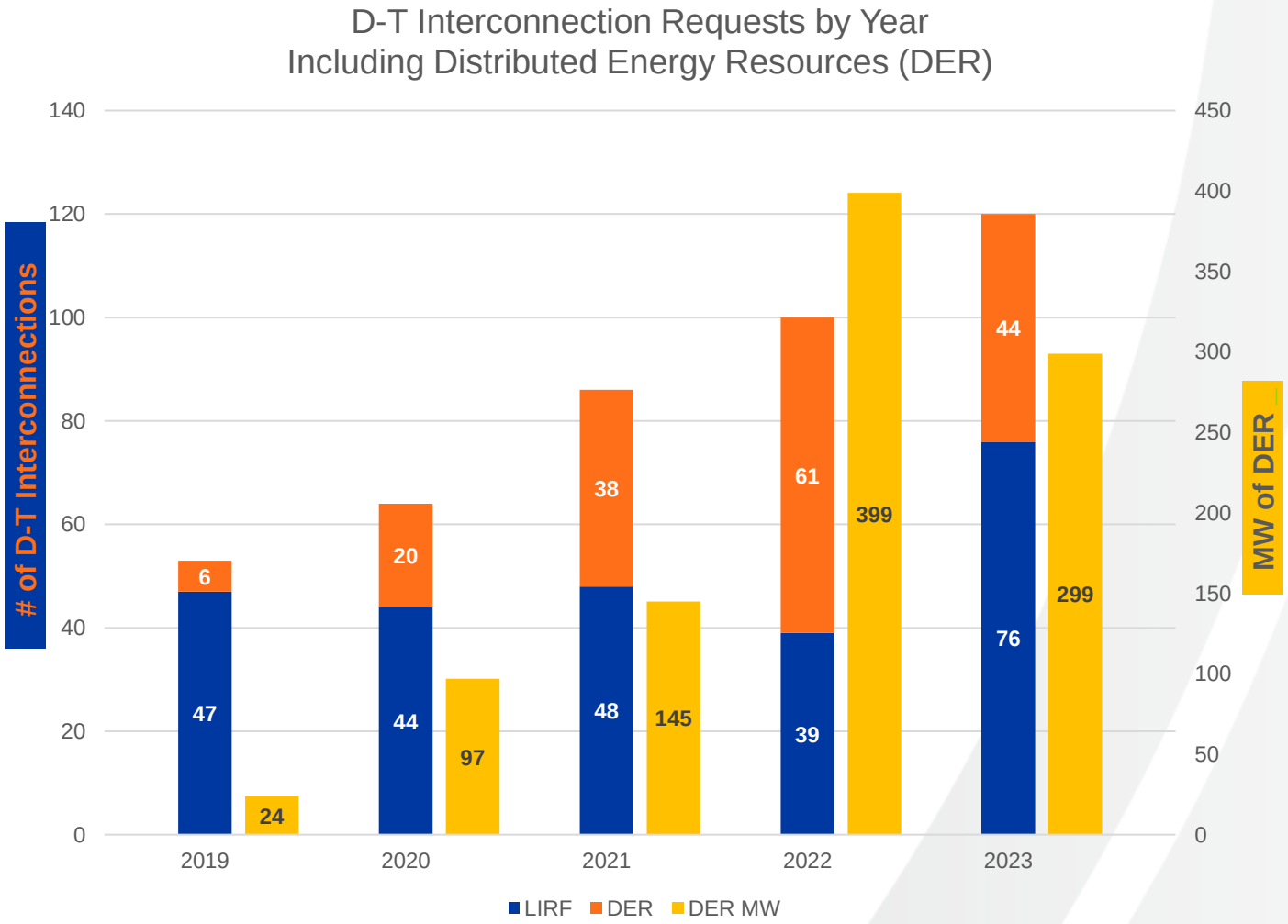
D-T Best Value Planning (BVP) Process

- Collaborative planning assessment to determine the best value solution for all parties
- Types of requests
  - New distribution substation
  - Distribution substation equipment change
  - Distributed energy resources (DERs)
  - Unforecasted load or change in load characteristics
  - Economic development projects
  - Power quality issues
- Individual Project Timelines Vary Widely

D-T Dashboard

220 Active Projects

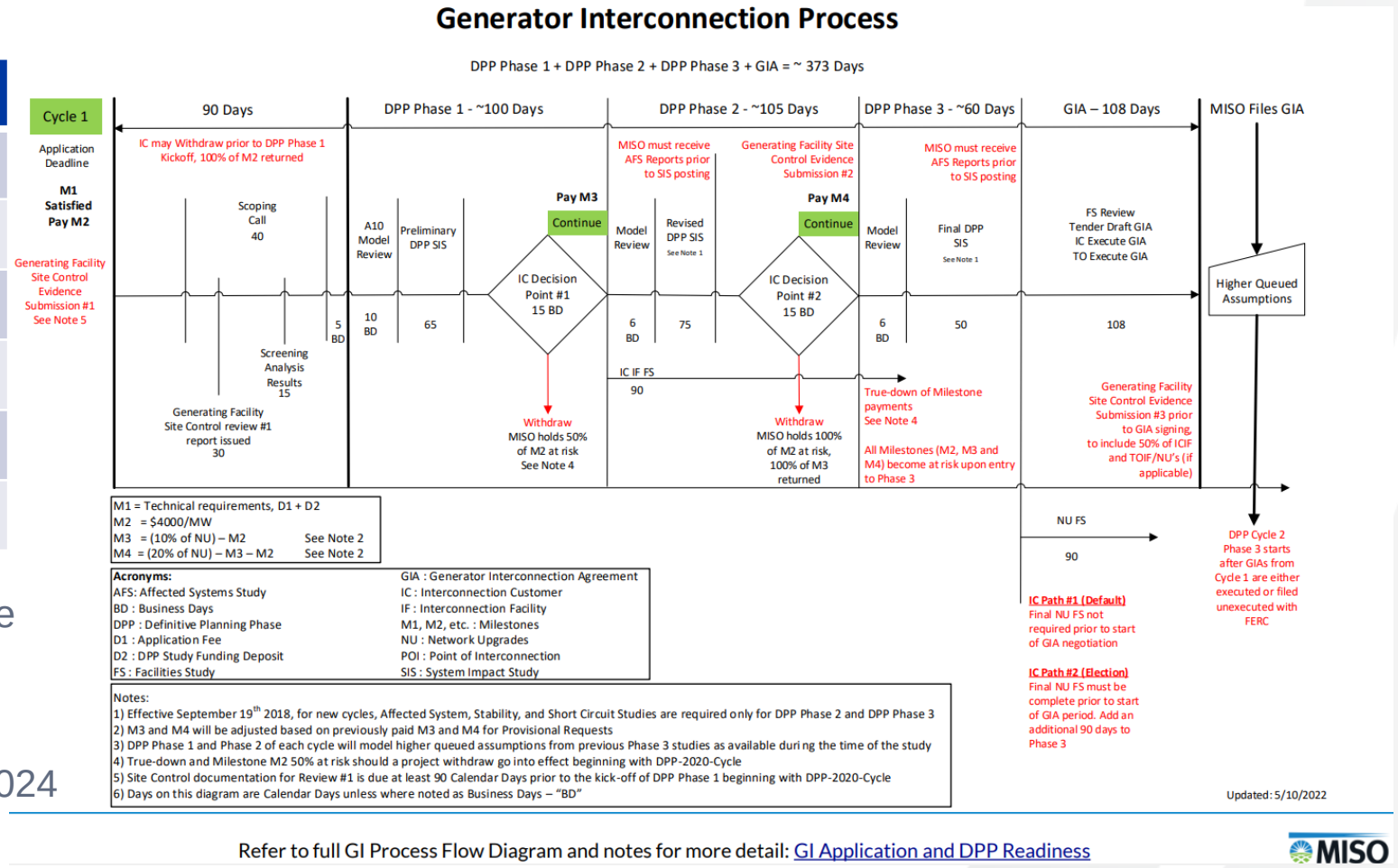




MISO Generation Interconnections Process

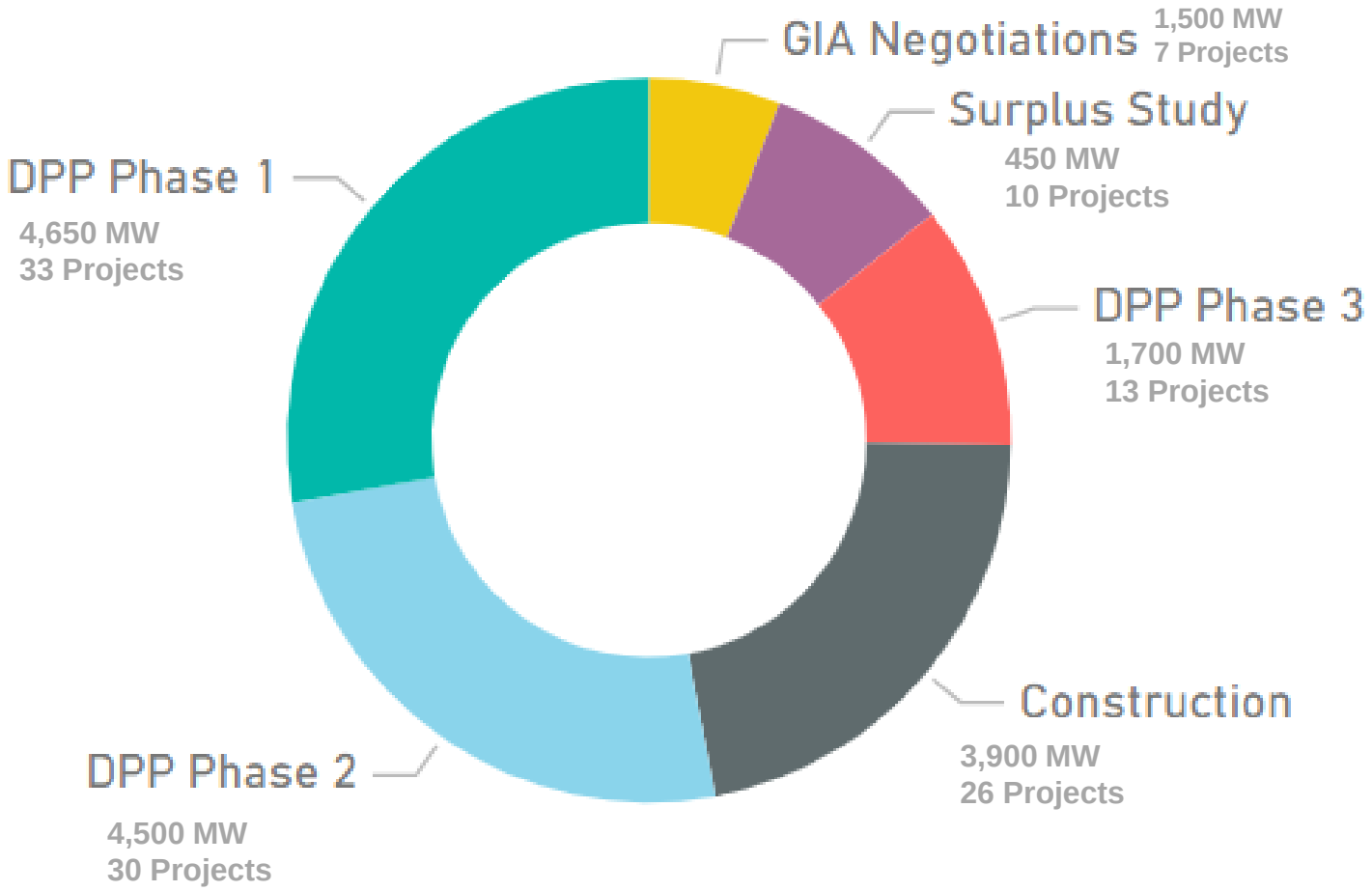
Study Cycle	Projects	MW
DPP-2017	13	2,100
DPP-2018	10	870
DPP-2019	16	1,700
DPP-2020	29	3,850
DPP-2021	38	5,200
DPP-2022	30	4,050

- DPP-2019 (and earlier) GIA Complete
- DPP-2020 GIAs in Progress
- DPP-2021 and DPP-2022 in Study
- DPP-2023 applications in March of 2024



Refer to full GI Process Flow Diagram and notes for more detail: GI Application and DPP Readiness

G-T Project Dashboard



Active MISO GT Projects
120
Developers
41
Total MWs in Queue
16.68K

- Solar - 9.2 GW
- Storage - 4.5 GW
- Gas - 1.7 GW
- Wind - 1.3 GW

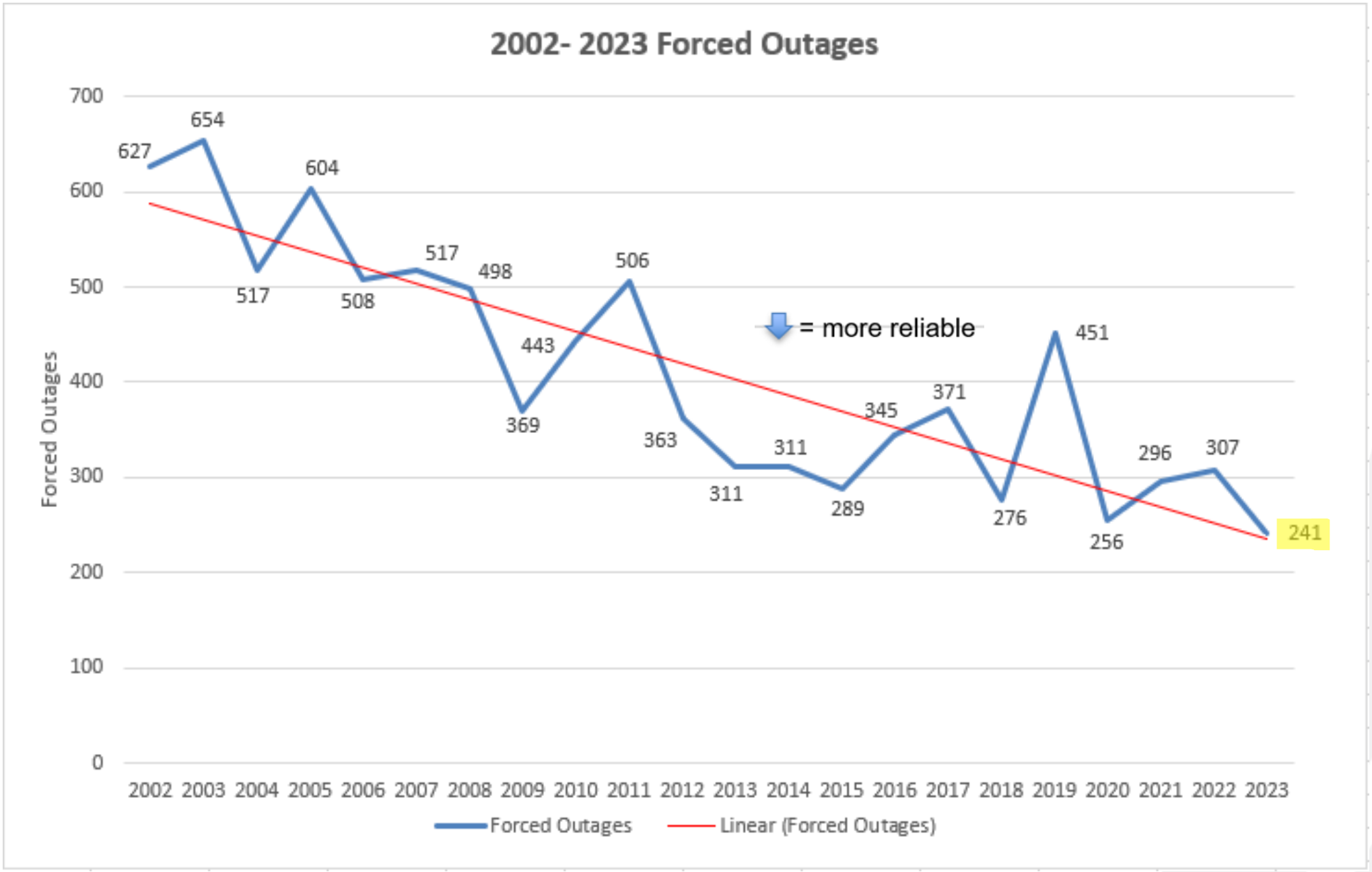
ATC's Asset Renewal strategy is about balancing Performance Risk and Life Cycle Costs – Justin Nettesheim

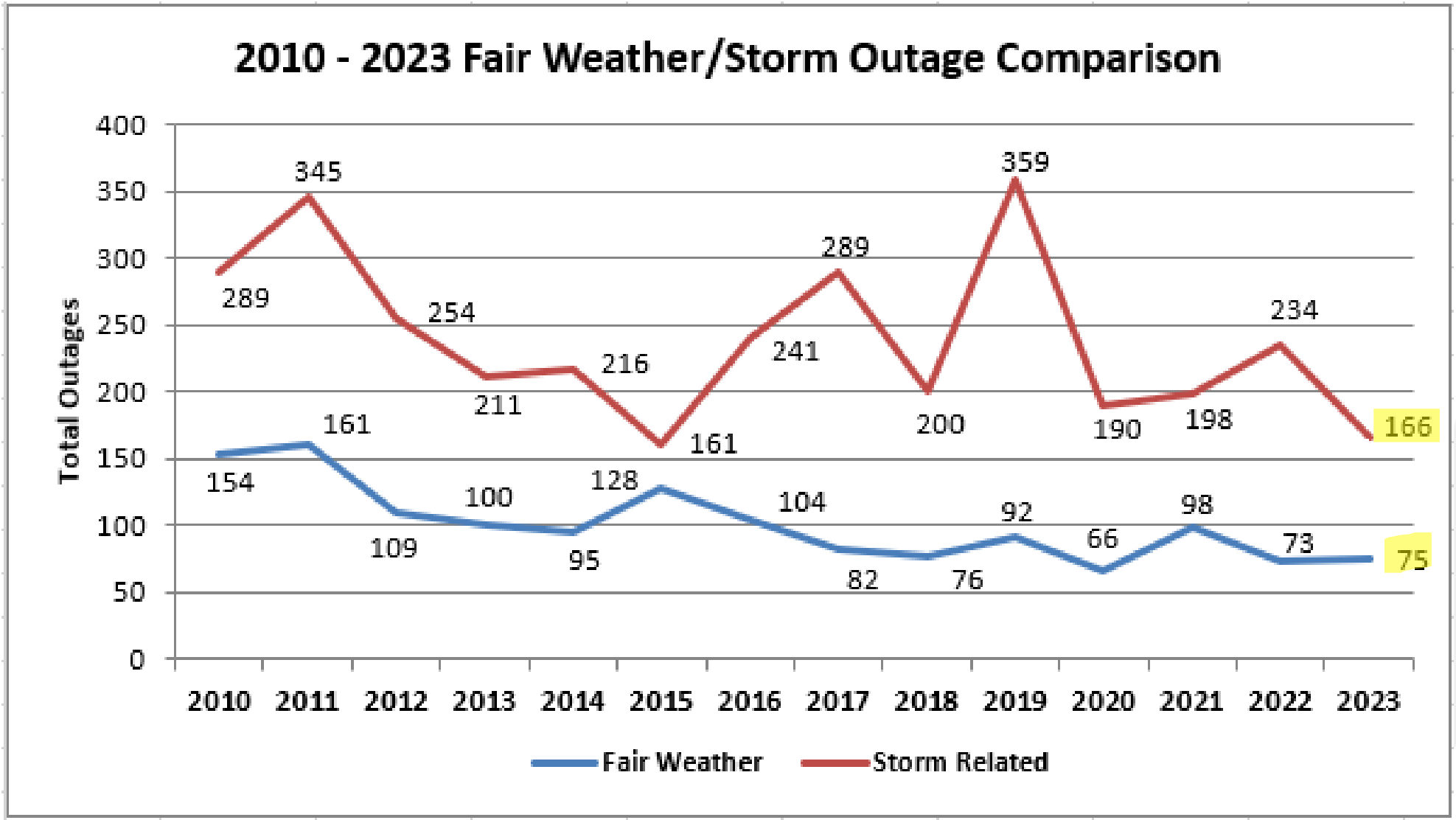
Asset Renewal Program Objectives

- Safety – public and worker
- Minimize total life cycle cost [Net Present Value of Revenue Requirements (NPV RR) from customer cost/rate perspective]
- Compliance
- Manage risk
- Reliable performance – maintain or improvement
- Environmental performance improvements
- Coordination with Stakeholders

Replacement is based on… (Hint: Not Age!)

- Safety – public and worker
- Condition – tests, maintenance costs/risks
- Obsolescence – part availability, factory support, craft labor expertise with this specific equipment, available spares
- Utilization – application, system changes
- Criticality – consequence of failure, outage impacts
- Costs – maintenance and replacement
- Environmental – PCB contamination, oil volumes and containment, proximity to waterways, SF6 gas leaks, lead, mercury, environmental compliance/risks
- Compliance – NERC, CIP, EPA, State DNR
- Other Considerations – test frequency, on-line monitoring, test information available, fleet size, common fleet issues, maintenance history, failure mode, industry experience





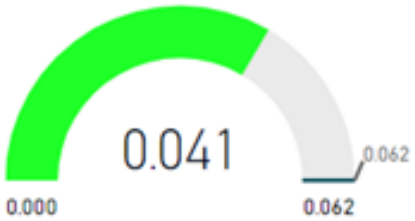
Reliability Performance: January - December 2023

Customer Impact

TSAIDI

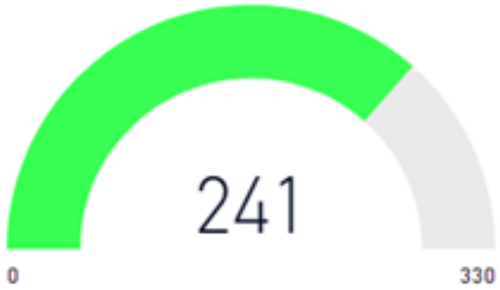
The 4.07 T-SAIDI YTD is 2.86 minutes less than our five year average of 6.93 minutes.

TSAIFI



The 0.041 T-SAIFI YTD is 0.021 less than our five year average of .062.

Total Forced Outages



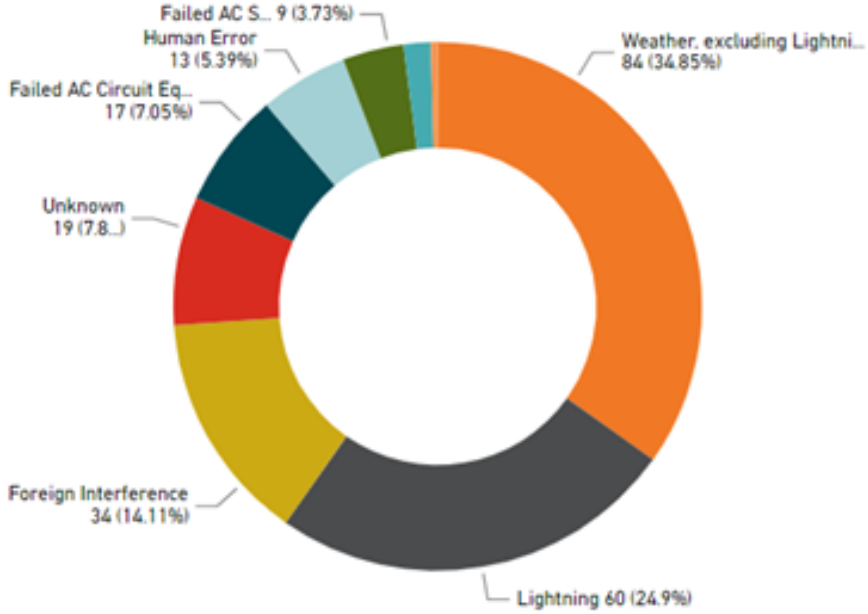
The 241 total Forced Outages YTD are 75 less than our five year average of 316.

2023 Top impacting outages:

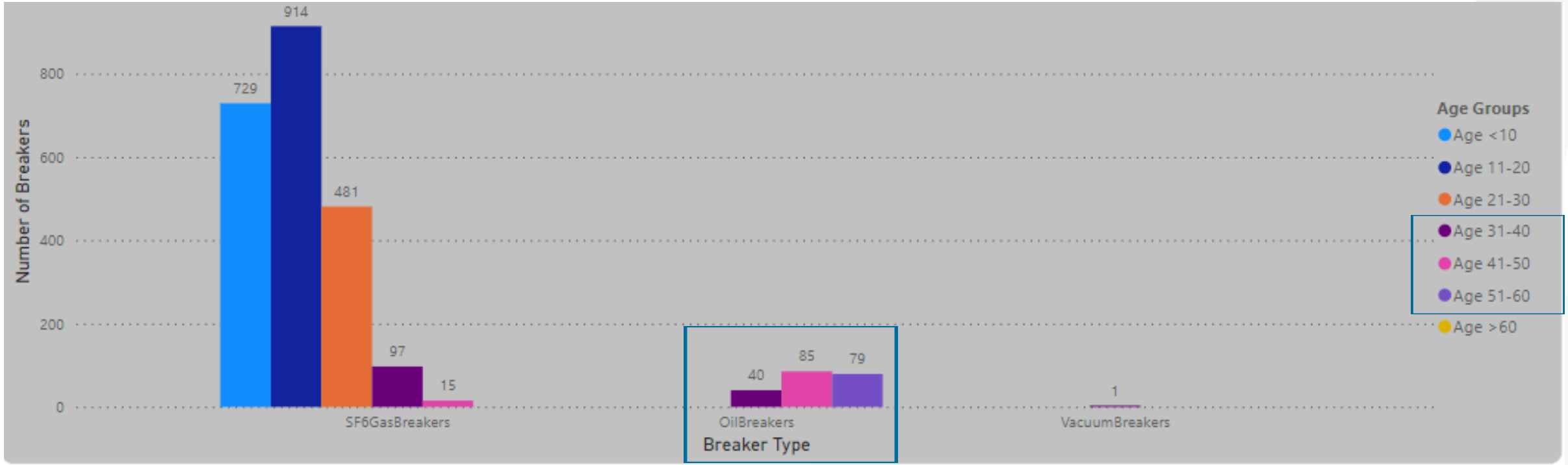
Failed static wire and pole on circuit Y-51 due to snow, ice and high winds impacted 2 delivery points (4,576 customers) for 16.4 hours. This accounted for 0.68 T-SAIDI minutes (17%) of the 4.07 T-SAIDI minutes YTD.

Two uprooted trees on circuit 6740 (Sagola Tap) impacted 2 delivery points (1453 customers) for 13.5 hours. This accounted for 0.43 T-SAIDI minutes (11%) of the 4.07 T-SAIDI minutes YTD.

Total Circuit Outages by Cause & Sub Cause



Circuit Breakers Age Distribution

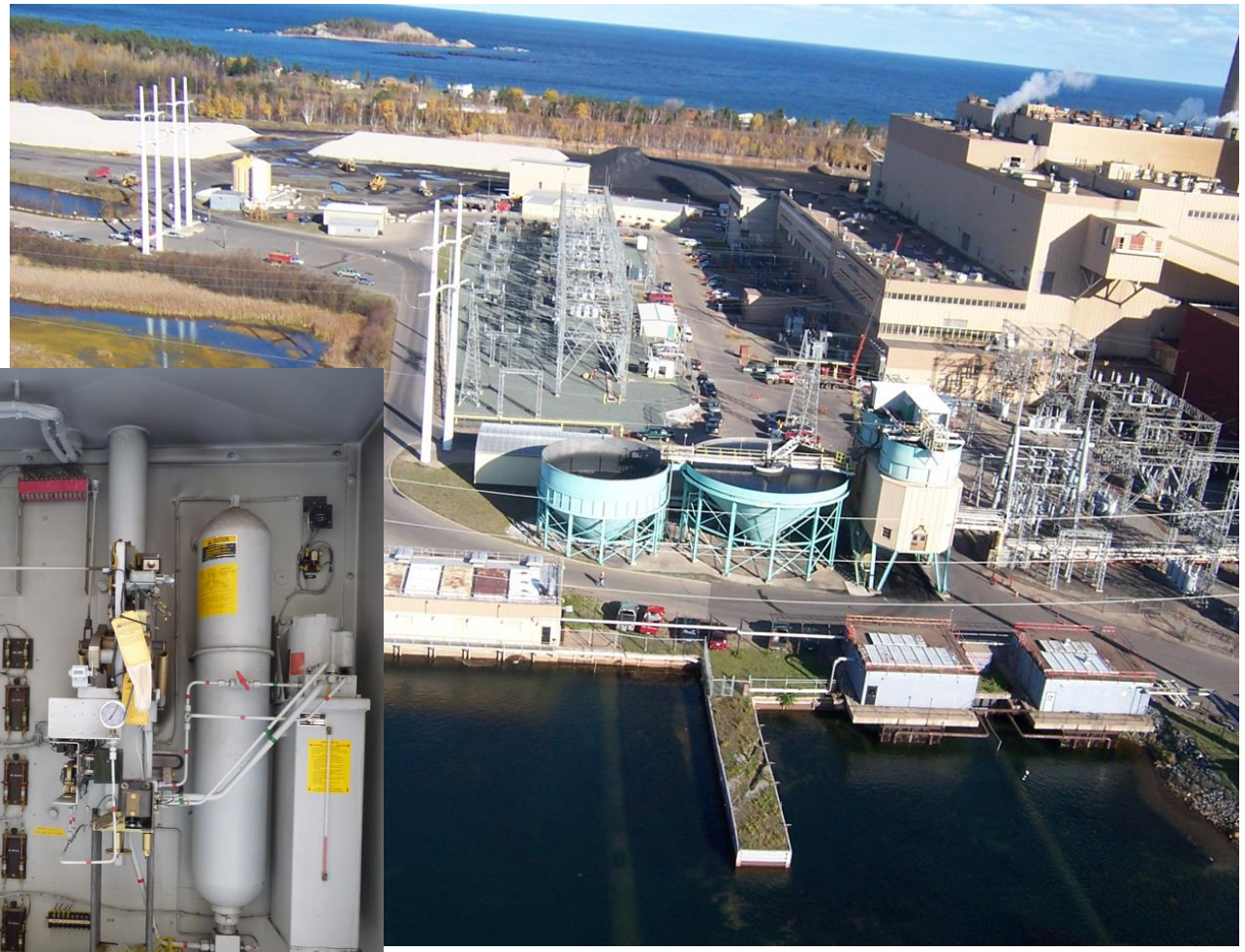


EquipmentSubType	Age <10	Age 11-20	Age 21-30	Age 31-40	Age 41-50	Age 51-60	Age >60
OilBreakers				40	85	79	
SF6GasBreakers	729	914	481	97	15		
VacuumBreakers				1			
Total	**729**	**914**	**481**	**138**	**100**	**79**	

Number of Breakers in Fleet

785	1413	238	2441
69 kV	115/138/161 kV	230/345 kV	Total

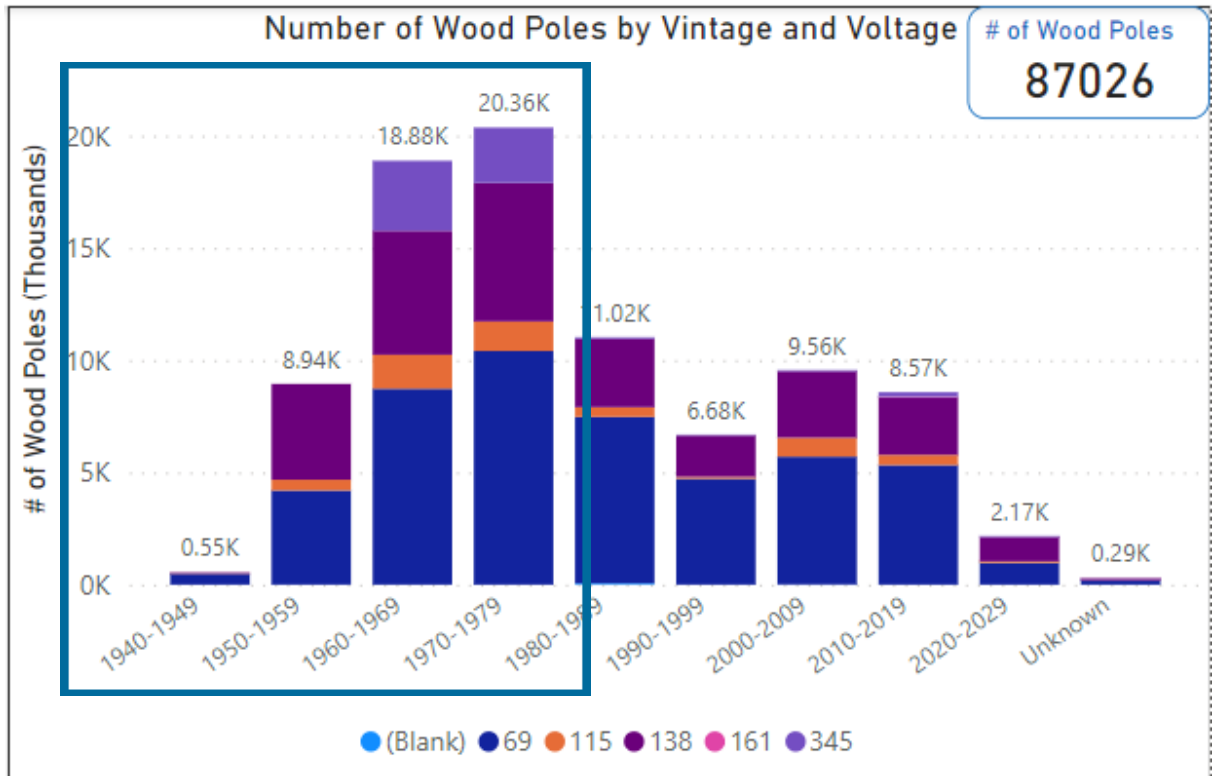
Presque Isle Switchyard – Breaker Asset Renewal



- Part of oil circuit breaker program to remove OCBs off system by 2029.
- Hydraulic Operating Mechanism is high maintenance and prone to leaks
- parts are no longer manufactured and limited field support
- HV bushings are at end of reliable life
- Microprocessor relays at end of life.
- Disconnect switches prone to difficult operation and at end of life.

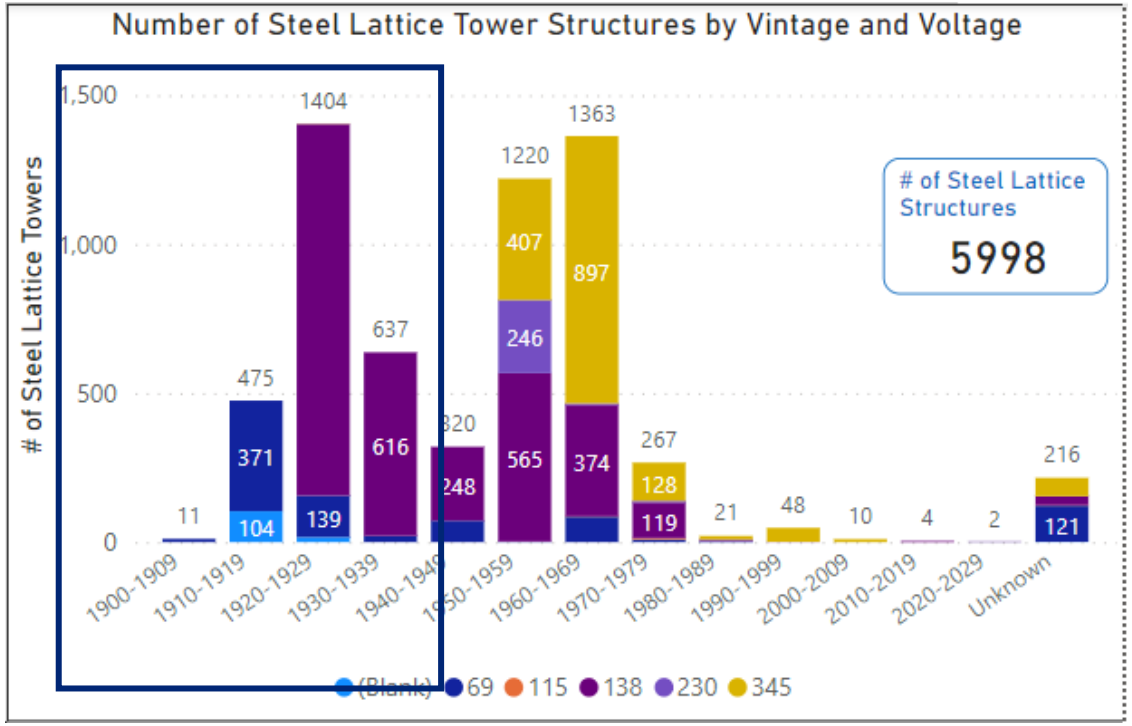
Overhead Transmission Lines – Wood Pole Lines 20-year Outlook

- Objective is to manage condition and preserve reliability and safety as these assets reach end of life.
- Pre-1980 vintage wood poles are likely to be replaced in the next 20 - 25 years.



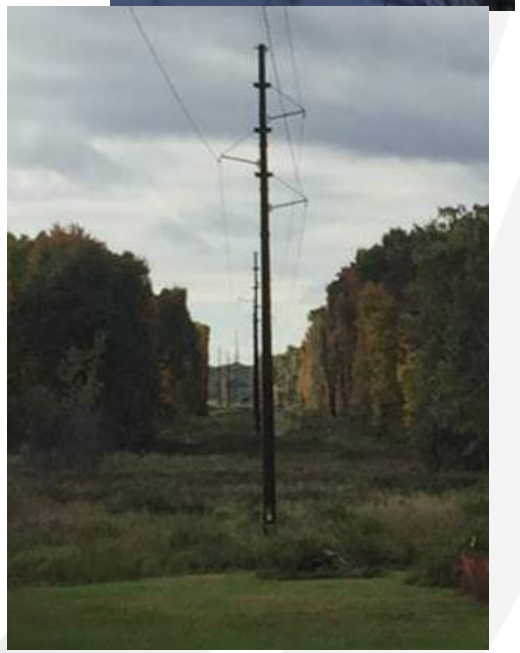
Overhead Transmission Lines – Steel Lattice Lines – Preliminary 20-year Outlook

- Objective is to manage condition and preserve reliability and safety as these pre-1940's assets reach end of life.
- Pre-1940 vintage lattice tower structures are likely to be replaced in the next 20 - 25 years.



Asset Renewal T-line Needs Example of Successful Project

- Portage – Dam Heights 69kV Rebuild (Line Y-16)
  - Project Background
    - Approximately 25 of miles of rebuild
  - Past Needs
    - Condition and Performance Issues
    - Replace 1910's vintage lattice structures
    - Outages: One of the most frequently outage ATC lines
      - ✓ On average about 4 outages per year
      - ✓ Need to update to avian friendly design
      - ✓ Improved lightning performance
  - Current status
    - Project went in-service Fall of 2017
    - One lightning outage since the new design went into service (Design 45kA strike, actual192kA strike)



Assessment Status – Ted Weber

- Next Steps
  - Needs comments – due March 29, 2024
  - Finalize needs – Early April
  - Preliminary solutions meeting/presentation – May 13, 2024
  - Finish sensitivity studies – May
  - Develop new or revised scope and cost estimates – June
  - ATC internal review/approval – August
  - 2024 Assessment publication – November 4, 2024

Contacts

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