Helping to keep the lights on, businesses running and communities strong.

2017 10-Year Assessment

Preliminary Needs

Stakeholder and Customer Presentation – February 21, 2017

Jeremy Voigt

Purpose

- Review Assumptions
- Summarize Preliminary Changes to Needs
- Solicit Input on Needs
- Solicit Input on Public Policy Driven Needs
- List Next Steps

Assumptions Review

- Studies
- Load Forecast
- Generation/Imports/Flows
- Asset Renewal Need Identification

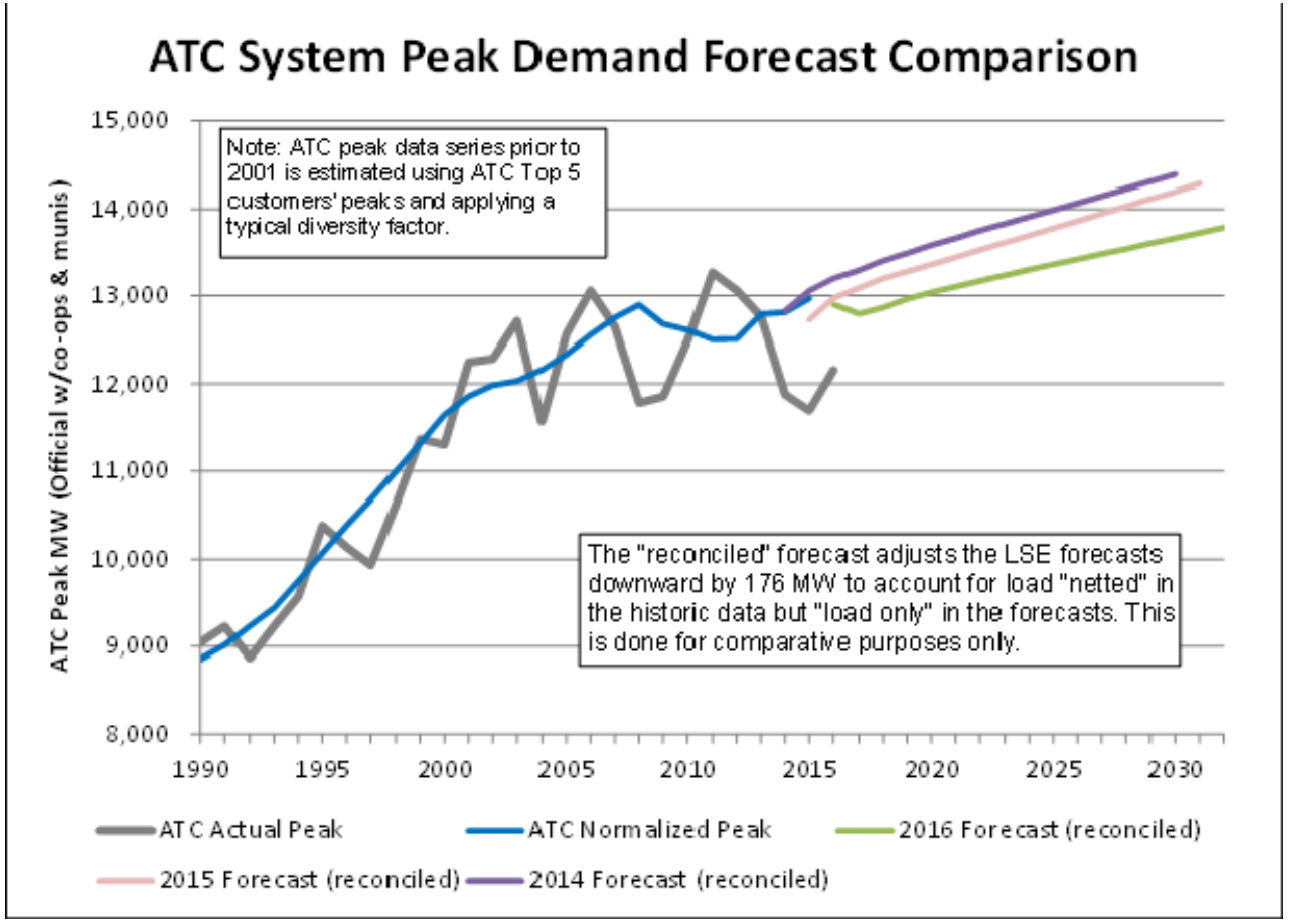
Core Assessment Studies

2016 TYA		2017 TYA	
Model	***Year(s) Studied***	***Model***	***Year(s) Studied***
Summer Peak	2017, 2021, 2026	Summer Peak	2018, 2022, 2027
Shoulder	2021, 2026	Shoulder	2022, 2027
40% Minimum Load	2017, 2021	40% Minimum Load	2018, 2022

Sensitivity Studies

- High Bias Case – Scope to be Determined
  - Not intending to propose projects in the 2017 10-Year Assessment

Load Forecast Trends



Load Forecast Trends, Continued

Model	ATC Load (MW)		
	2015 Assessment	2016 Assessment	2017 Assessment
Year 1 Summer Peak	13,400	13,400	13,000
Year 5 Summer Peak	+400	+300	+300
Year 10 Summer Peak	+800	+700	+600
Year 5 Shoulder	9,800	9,800	9,400
Year 10 Shoulder	+300	+300	+200

Off-Peak Load Forecasts

- Shoulder
  - 70% of summer peak in Zones 1, 3, southern 4, and 5
  - 80% of summer peak in northern Zone 4
  - 90% of summer peak in Zone 2

- Minimum
  - 40% of summer peak for all Zones
  - Power factors: historical minimum for a Local Balancing Authority

Generation Dispatch Changes Compared to the 2016 Assessment

- Additions
  - J384: 21 MW increase at Rockgen Energy Center
  - J395: 98 MW Quilt Block Wind Farm
  - J390: 702 MW Riverside Energy Center
- ATC Net Interchange

Model	ATC Net Interchange	
	2016 Assessment	2017 Assessment
Year 1 Summer Peak	66	-103
Year 5 Summer Peak	-93	-102
Year 10 Summer Peak	-91	-101
Year 5 Shoulder	-175	-262
Year 10 Shoulder	-174	-250

Flow Changes Compared to 2016 Assessment

- Peak Models
  - Reduction in west to east flows through the ATC system
- Potential Causes
  - Interchange variation
  - Variation in dispatching generation outside of ATC

Model	ATC Western Interface Flow		ATC Southern Interface Flow	
	2016 Assessment	2017 Assessment	2016 Assessment	2017 Assessment
Year 1 Summer Peak	-555	-278	603	158
Year 5 Summer Peak	-635	-349	525	230
Year 10 Summer Peak	-735	-330	626	211
Year 5 Shoulder	-92	-654	-99	378
Year 10 Shoulder	-537	-238	347	16

Asset Renewal (AR) Need Identification

- Focused on Life Cycle Management of ATC's Transmission Assets
- Driven by Public and Worker Safety, Regulatory Compliance, Reliability and Operational Performance
- Objective
  - Ensure assets perform required function in sustainable manner
  - Manage life cycle costs
  - Coordination of design, commissioning, operation, maintenance and replacement strategy needed to achieve objective
  - Asset renewal is the "replacement strategy" piece of the asset life cycle
  - Ensure long term plan meets ATC and customer needs

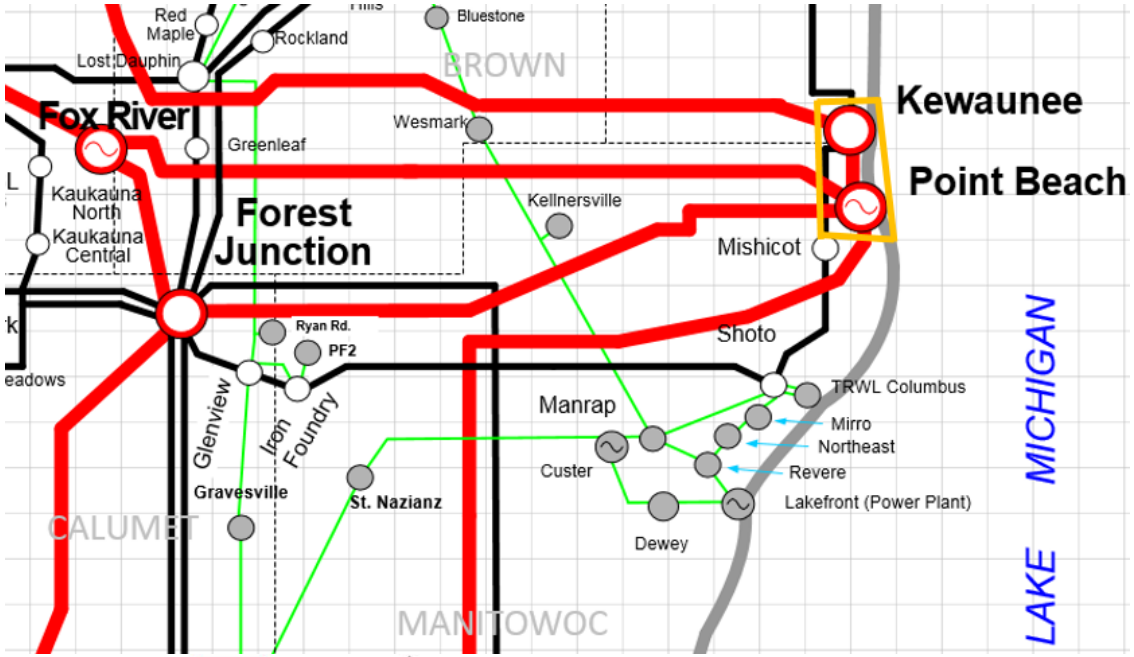
Preliminary Needs

- Needs identified since the 2016 TYA
  - Contingency Driven: 4
  - Asset Renewal Driven: 2
- Continuing Needs
  - Numerous
- Eliminated Needs
  - Contingency Driven: 2
  - Asset Renewal Driven: 0

Looking for Stakeholder Input

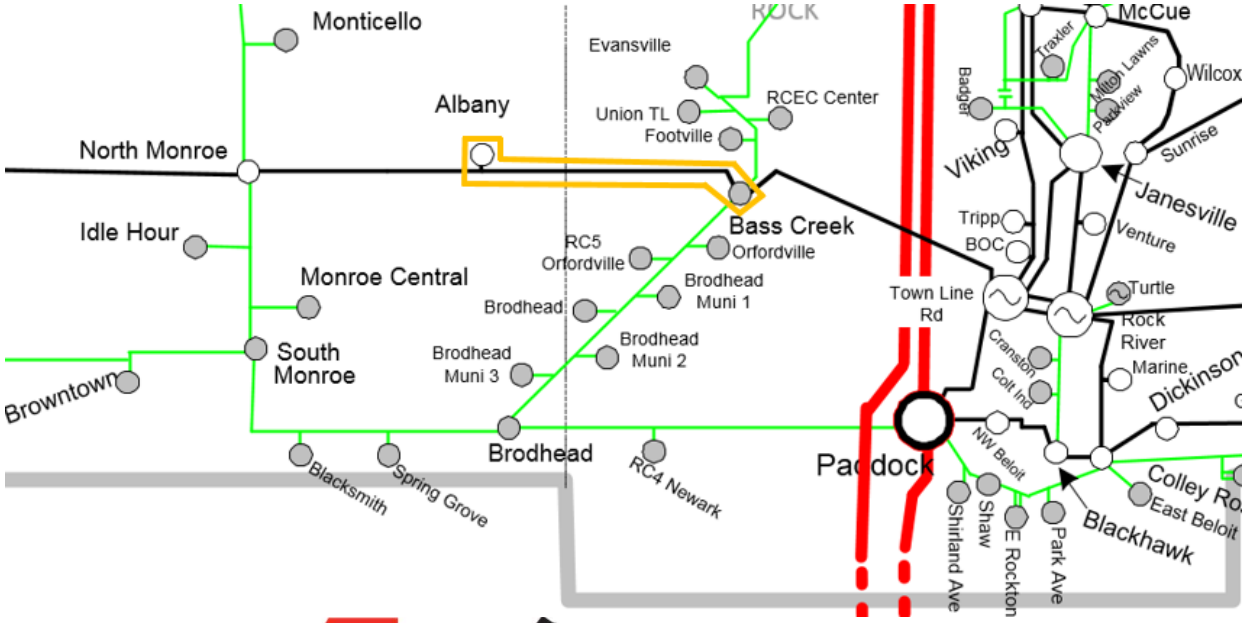
Contingency Need: Point Beach – Kewaunee 345-kV Overload

Model Year	Emergency Loading	Contingency Type
2018 Peak	97%	P3-2
2022 Peak	99%	
2027 Peak	102%	
2022 Shoulder	<95%	
2027 Shoulder	<95%	



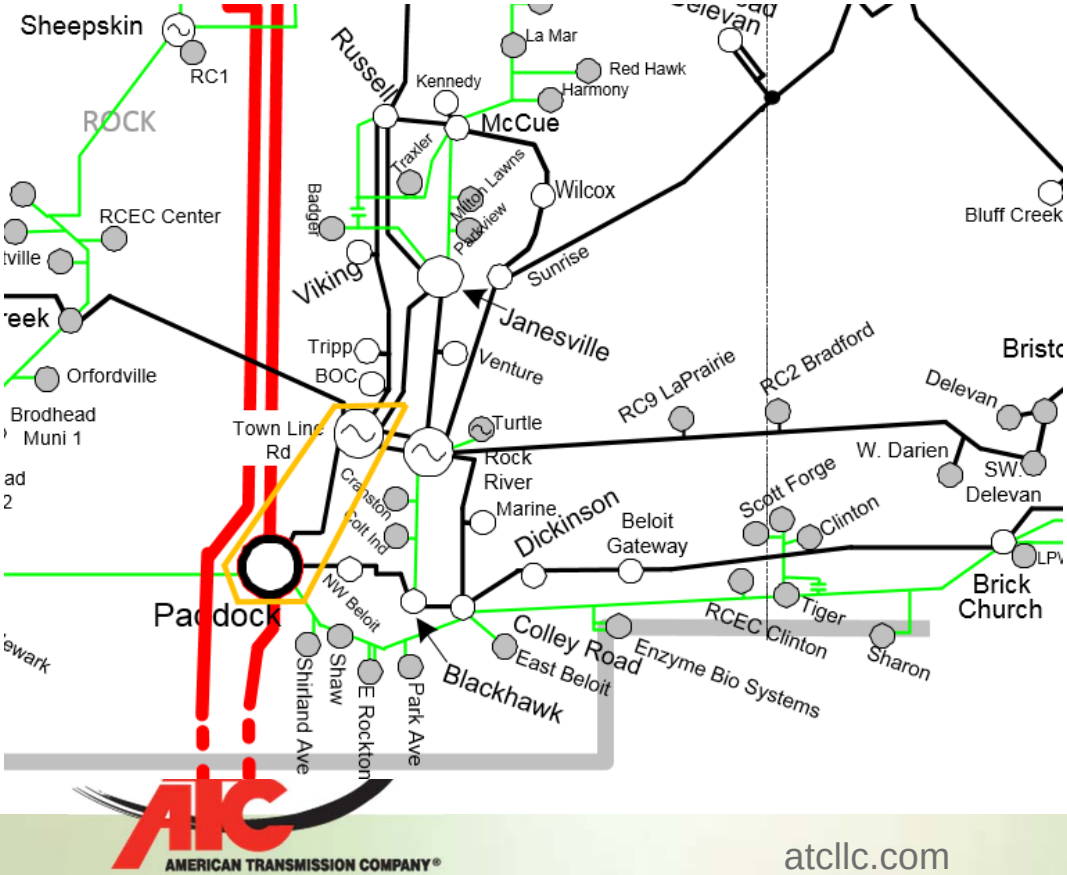
Contingency Need: Albany – Bass Creek 138-kV Overload

Model Year	Emergency Loading	Contingency Type
2018 Peak	<95%	P3-3
2022 Peak	<95%	
2027 Peak	101%	
2022 Shoulder	<95%	
2027 Shoulder	<95%	



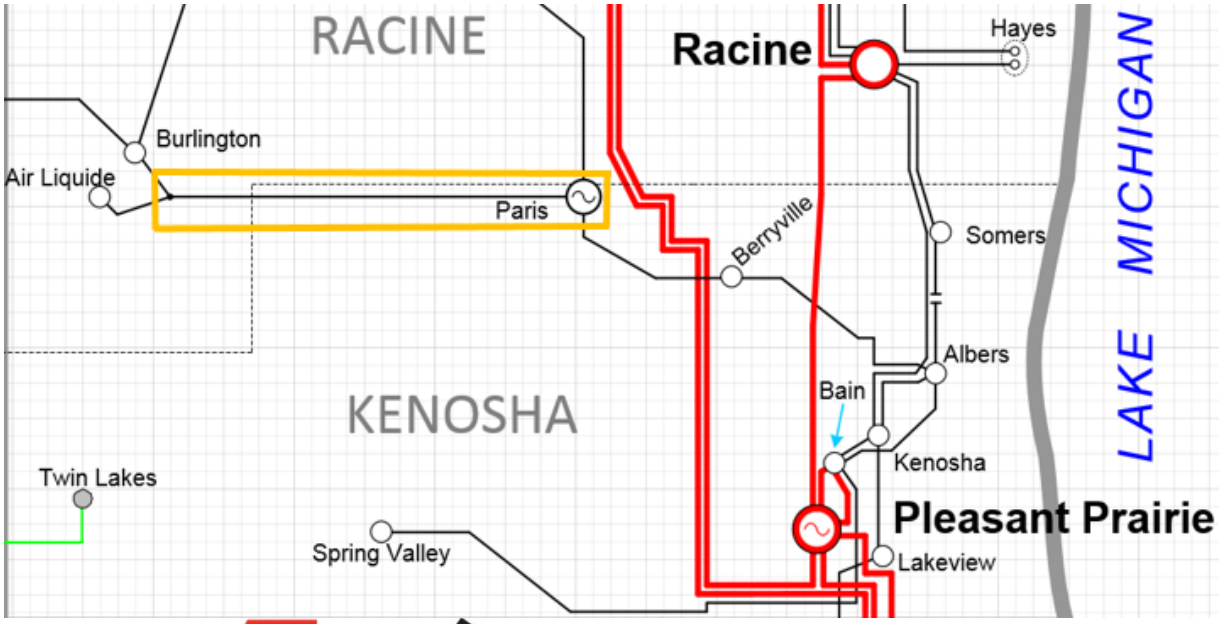
Contingency Need: Paddock – Townline Road 138-kV

Model Year	Emergency Loading	Contingency Type
2018 Peak	<95%	P3-2
2022 Peak	<95%	
2027 Peak	101%	
2022 Shoulder	<95%	
2027 Shoulder	<95%	



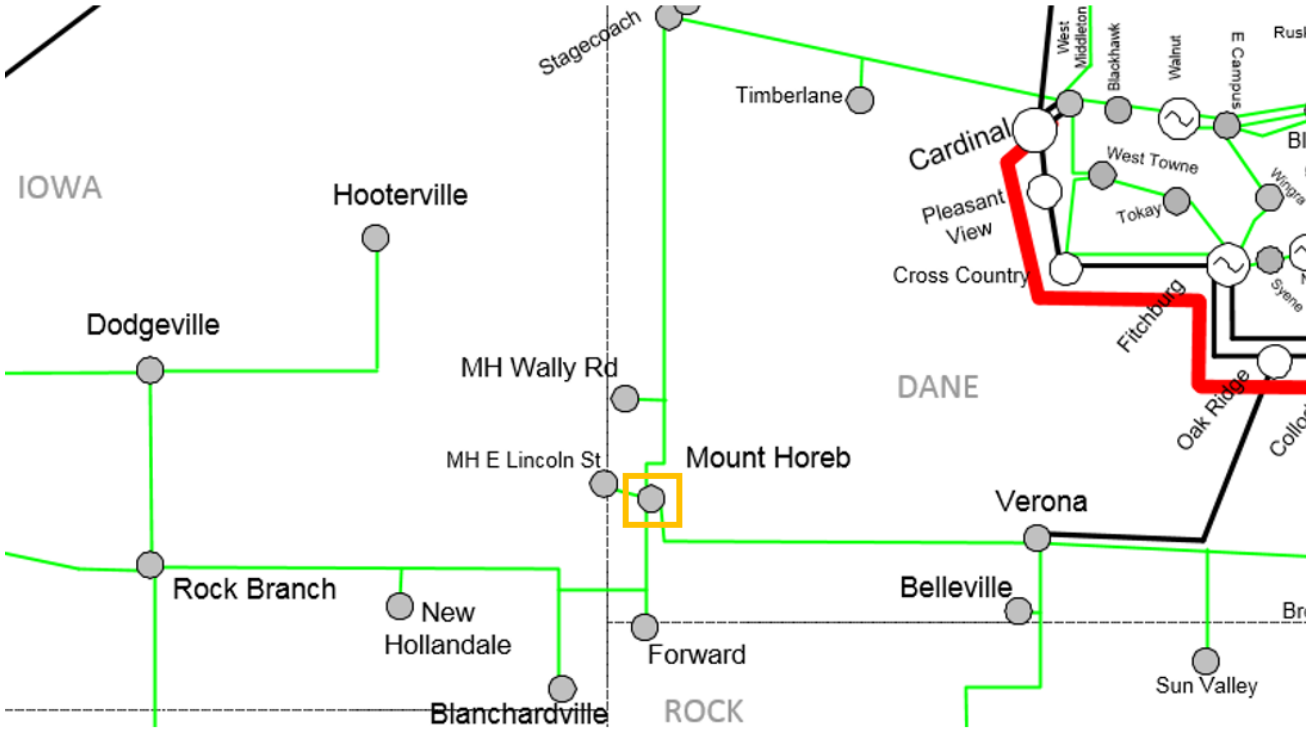
Contingency Need: Paris – Air Liquide Tap 138-kV

Model Year	Emergency Loading	Contingency Type
2018 Peak	<95%	P3-3
2022 Peak	<95%	
2027 Peak	101%	
2022 Shoulder	<95%	
2027 Shoulder	<95%	



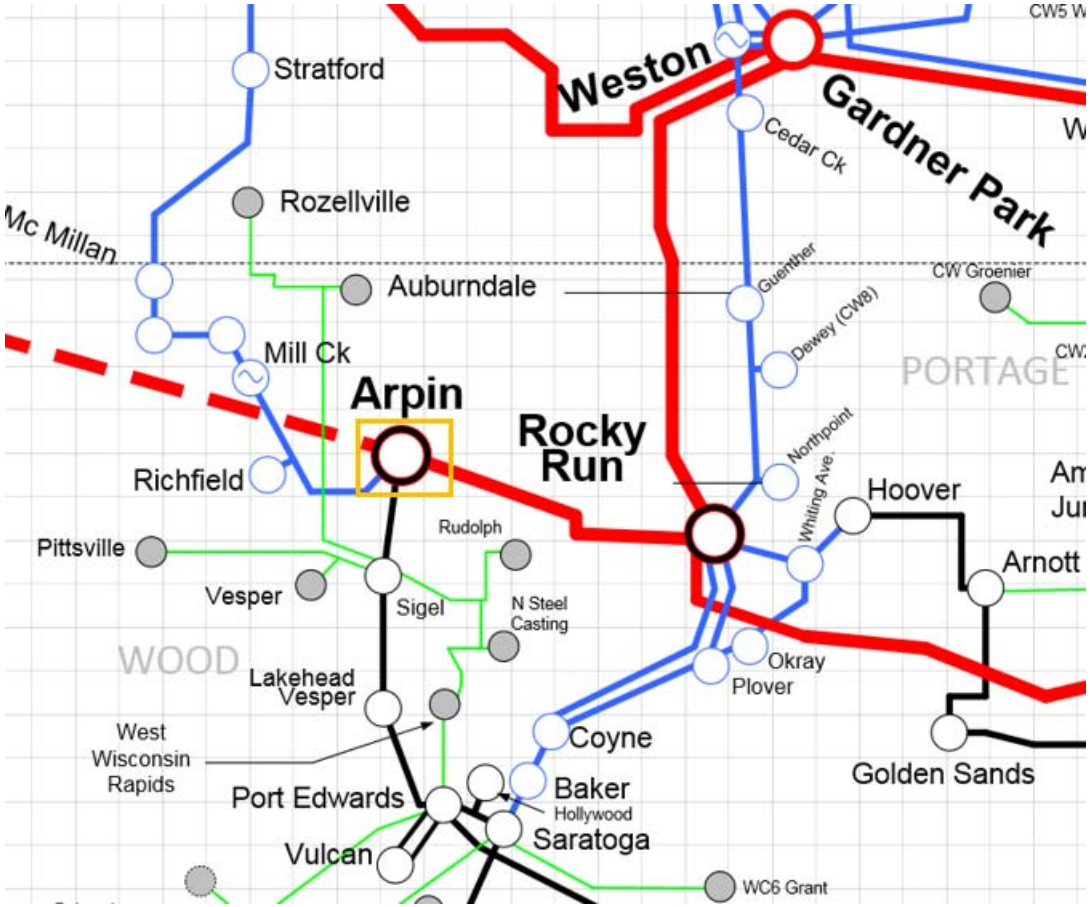
AR Need: Mount Horeb 69-kV Substation

- Need Year – 2018
- Condition



AR Need: Arpin 345/138/115-kV Substation

- Need Year – 2025
- Condition



Updates to ATC 10-Year Assessment Network Project List

- New Needs Identified Since the 2016 10-Year Assessment
  - Updates to ATC 10-Year Assessment Network Project List

Projects with Continuing Needs

- See Preliminary Network & AR Needs Table

Network Projects with Eliminated Needs

System Addition	2015 TYA Network Need Year	2016 TYA Network Need Year	2017 TYA Network Need Year	Planning Zone	Need Category	MISO MTEP16 Appendix Status	MISO MTEP17 Targeted Appendix Status	MTEP PRJiD
Wesmark Substation: Install 2-8 Mvar 69-kV capacitor banks	>2030	>2031	>2032	4	reliability (69P2.1)	targeted B	--	9935
Construct Shoto to Custer 138-kV line	>2030	>2031	>2032	4	reliability (69P1.2, 69P1.3)	B	--	1719
Custer Substation: Install 138/69-kV transformer	>2030	>2031	>2032	4	reliability (69P1.2, 69P1.3)	B	--	1718

Public Policy Requirements – Comments?

- Any public policy driven needs that may not be covered by the Assessment process?

Assessment Status

- Completed
  - Requested load forecast from LDCs
  - Sent final load forecast back to LDCs
  - Process and assumptions meeting

- Next Steps
  - Needs comments - due March 21
  - Finalize needs - end of March
  - Preliminary solutions meeting/presentation – April 27
  - Finish sensitivity studies - May
  - Develop scope and cost estimates – June
  - Complete multiple outage study - June
  - Draft study write-up - July
  - ATC review/approval – August
  - 2017 Assessment publication - September

Questions?

For more information, please contact Jeremy Voigt

Phone: 262-832-8742

Email: jvoigt@atcllc.com