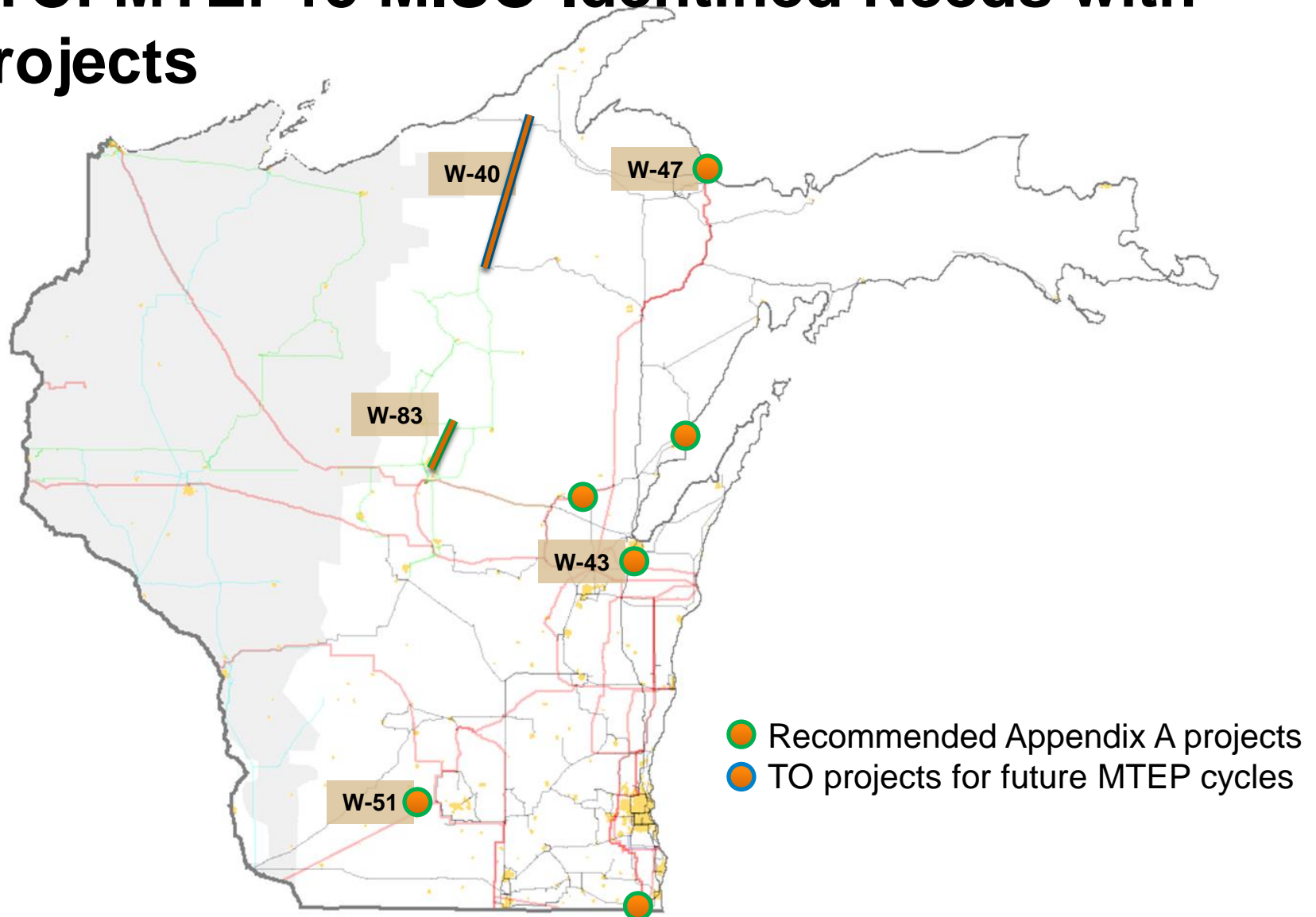


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American Transmission Company MTEP15 Project Review

3rd West Sub-regional Planning Meeting
July 27, 2015

ATC: MTEP15 MISO-Identified Needs with Projects



The complete list of issues is tabulated in spreadsheet [Issues_Tracker.xlsx](#)

ATC: MTEP15 MISO-Identified Needs

Index	Limiting Elements	Needs Summary
W-40	Conover-Mass 69	P6 x 3 for 220.4% overload 0.868 pu voltages
W-43	Glory Road-DePere 138	P7 x 1 for 109.1% overload
W-47	Northern UPMI 138	P5 x 1 for 130.5% overload 0.513 pu voltages
W-51	West Middleton-Stagecoach 69	P2 x 3 for 104.2% overload
W-83	Kelly-Bunker Hill 115	P6 x 2 for 110.0% overload

NERC TPL-001-4 Table 1 Event Descriptions

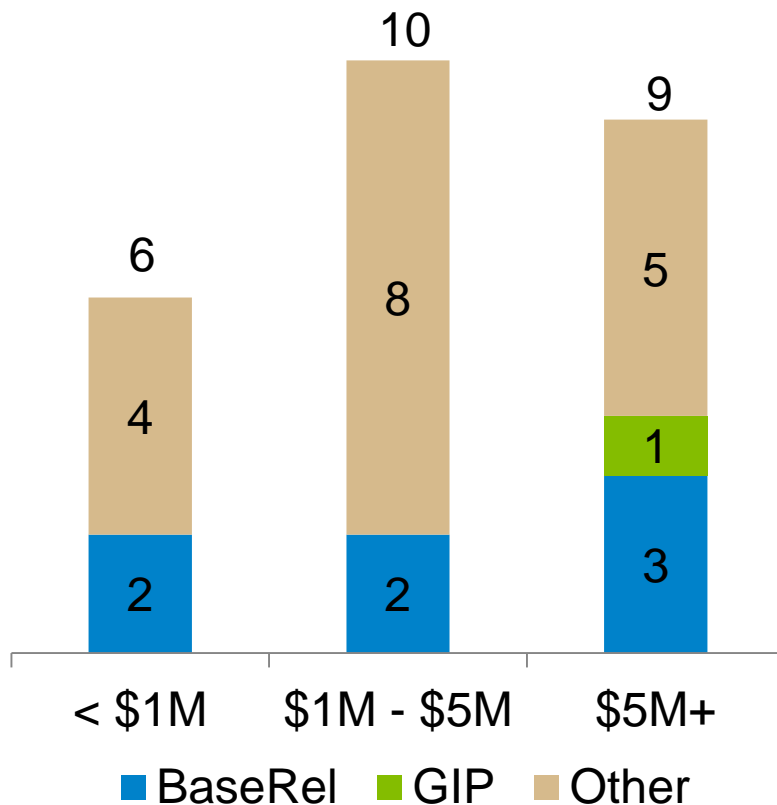
New Category	Old Category	Description
P0	Cat A	System intact
P1	Cat B	Single contingency (Fault of a shunt device- fixed, switched or SVC/STATCOM is new)
P2	Cat C1, C2	Single event which may result in multiple element outage. Open line w/o fault, bus section fault, internal breaker fault
P3	Cat C3	Loss of generator unit followed by system adjustments + P1. No load shed is allowed
P4	Cat C	Fault + stuck breaker events
P5	n/a	Fault + relay failure to operate (new)
P6	Cat C3	Two overlapping singles (not generator)
P7	Cat C5, C4	Common tower outages; loss of bipolar DC

A large, light gray, stylized sun graphic is positioned on the left side of the slide. It features a central white circle with rays extending outwards, forming a semi-circle at the top and a larger, more complex shape at the bottom. The rays are represented by various geometric shapes like triangles and trapezoids.

ATC Recommended Appendix A in MTEP15 Projects

ATC: MTEP15 Recommended Appendix A

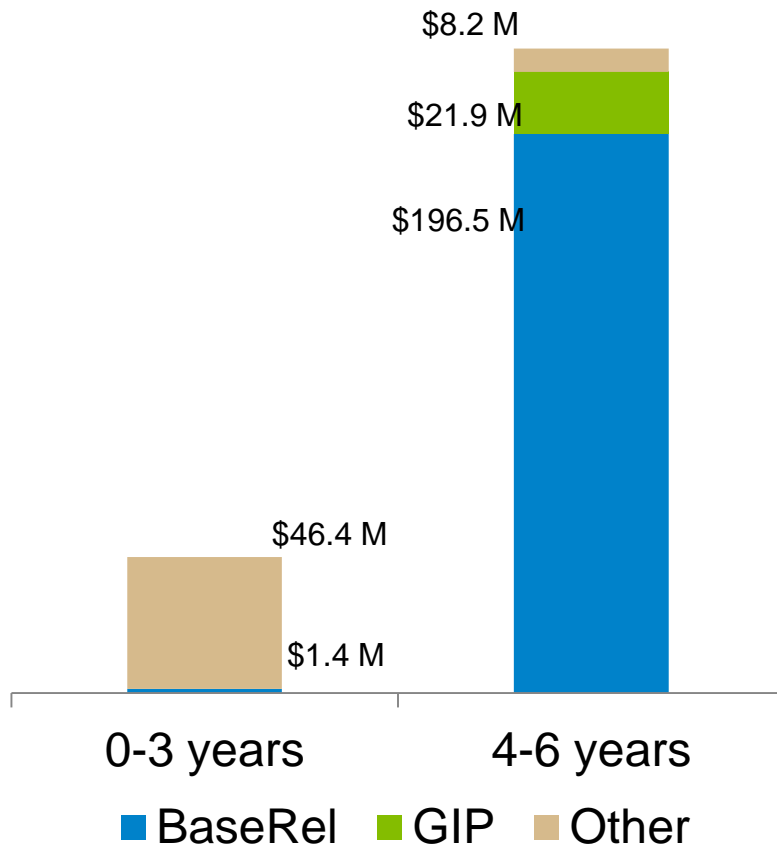
Project Count by Range of Estimated Cost



- ATC has a total of 51 projects in the MTEP15 database
- 25 projects proposed for Appendix A in MTEP15 (\$301.6 M)
 - 9 have an estimated cost greater than \$5 M
 - 10 have an estimated cost between \$1M-\$5 M
 - 6 have an estimated cost lower than \$1 M
 - 7 are Baseline Reliability
 - 1 are Generator Interconnection
 - 17 are Other Projects
- 26 projects are proposed to move to Appendix B (\$936.8 M)

ATC: MTEP15 Recommended Appendix A

Project Cost by Range of Estimated Date



- ATC has a total of 51 projects in the MTEP15 database
- 25 projects proposed for Appendix A in MTEP15 (\$301.6 M)
- The majority of project costs before 2018 are for Other Projects, and
- The majority of project costs for 2018 and beyond are for Baseline Reliability Projects
- Top two projects:
 - P8071 Construct Plains-National 138 kV: \$114 M
 - P8065 Construct Southeast Wisconsin - Northeast Illinois 345 kV transmission reinforcement: \$52 M

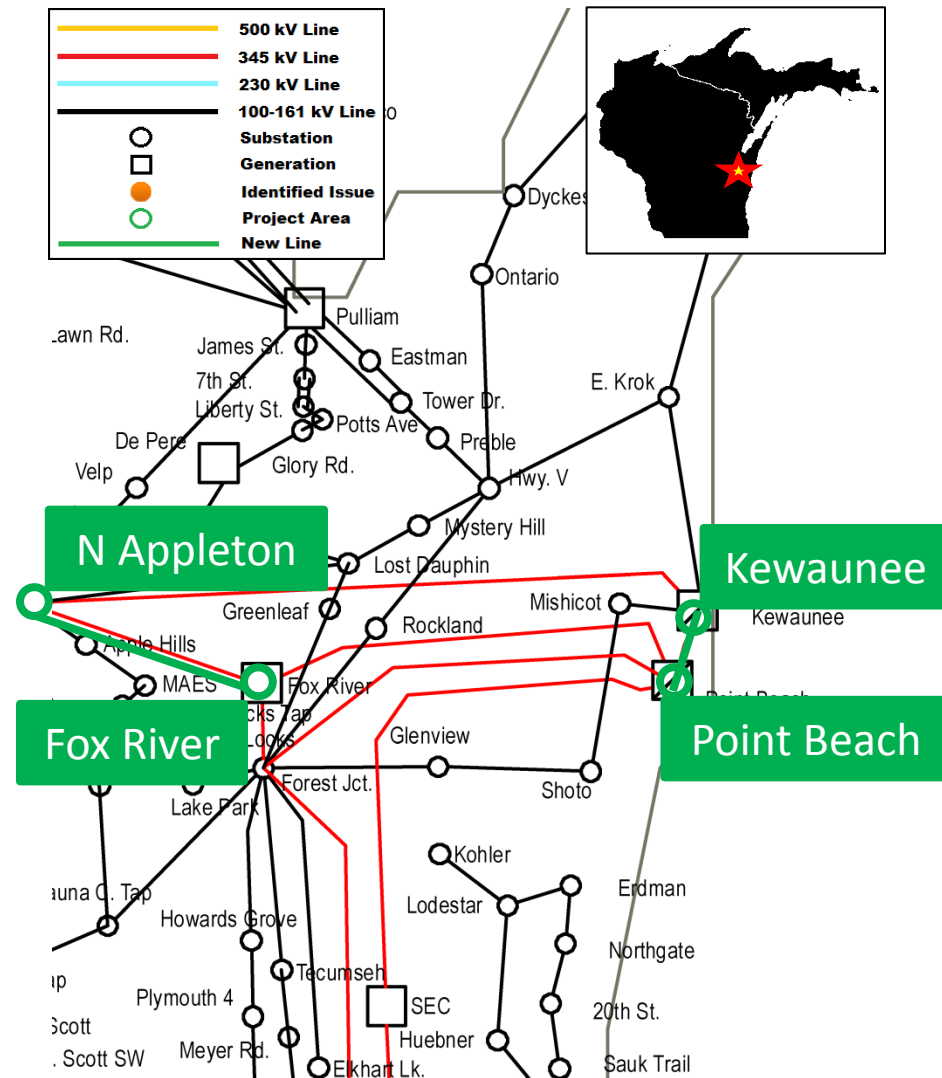
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ATC Recommended Appendix A in MTEP15 Projects

Updated since SPM2

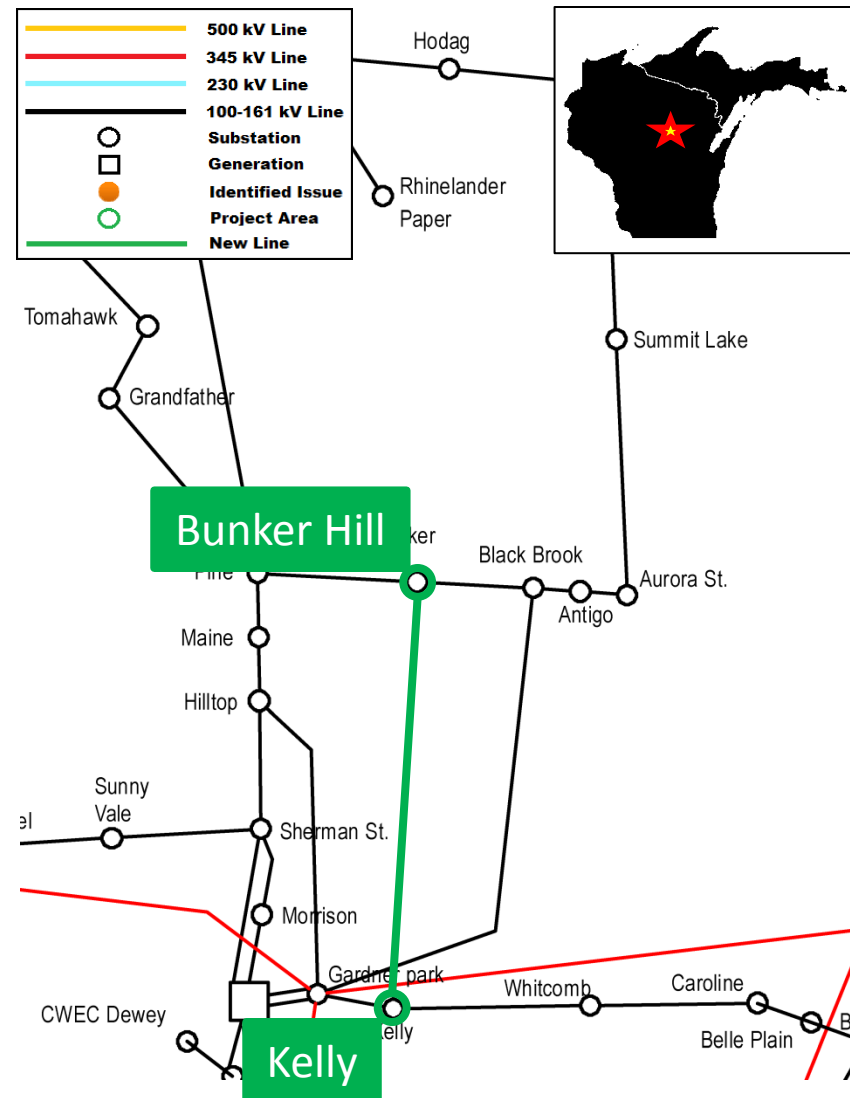
ATC: P9320

- **Expand Fox Energy Center Generation**
 - Add new 1x1, 475 MW natural gas combined cycle power plant
 - Reconfigure and expand the Fox River 345 kV switching station from a six-position ring bus to an eight-position breaker-and-a-half
 - Uprate Fox River-North Appleton 345 kV Line 6832 and re-route to new position in the station
 - Uprate Point Beach-Kewaunee 345 kV Line Q-303
- **Estimated Cost \$21.9M**
- **Expected ISD 2018 Dec**
- **Project Type**
 - GIP J293



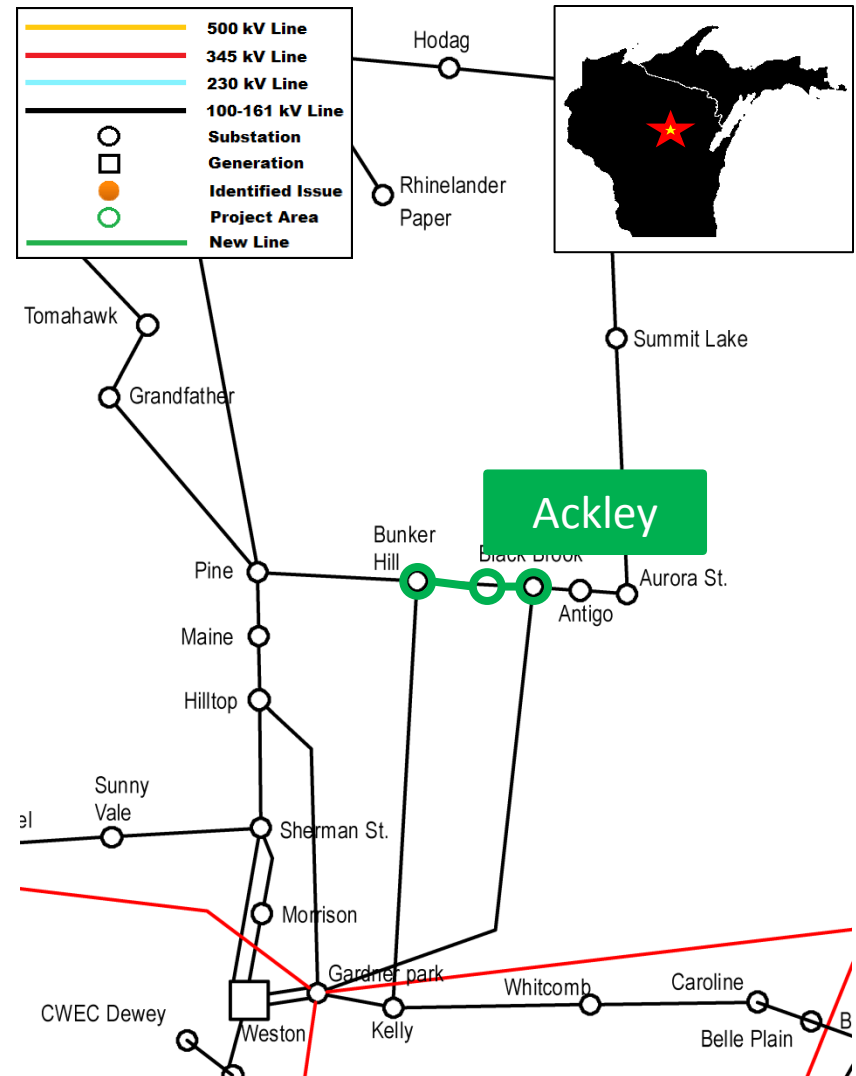
ATC: P7602

- **Uprate Bunker Hill-Kelly 115 kV**
 - Uprate Bunker Hill-Kelly 115 kV
- **Estimated Cost \$4.8M**
- **Expected ISD 2019 Oct**
- **Project Type**
 - Baseline Reliability
- **System Needs**
 - P1 during off-peak maintenance outage of Maine-Pine 115 (W-83)



ATC: P7603

- **Rebuild Bunker Hill-Blackbrook 115 kV**
 - Rebuild Blackbrook-Bunker Hill portion of M-13.
 - Retire Blackbrook and Bunker Hill stations and build new Ackley ring bus.
- **Estimated Cost \$25.2M**
- **Expected ISD 2019 Nov**
- **Project Type**
 - Baseline Reliability
- **System Needs**
 - Asset Renewal
 - Protection & Operations challenges: presently two back-to-back three terminal lines
 - P1 during off-peak maintenance outage of Maine-Pine 115 (W-83)



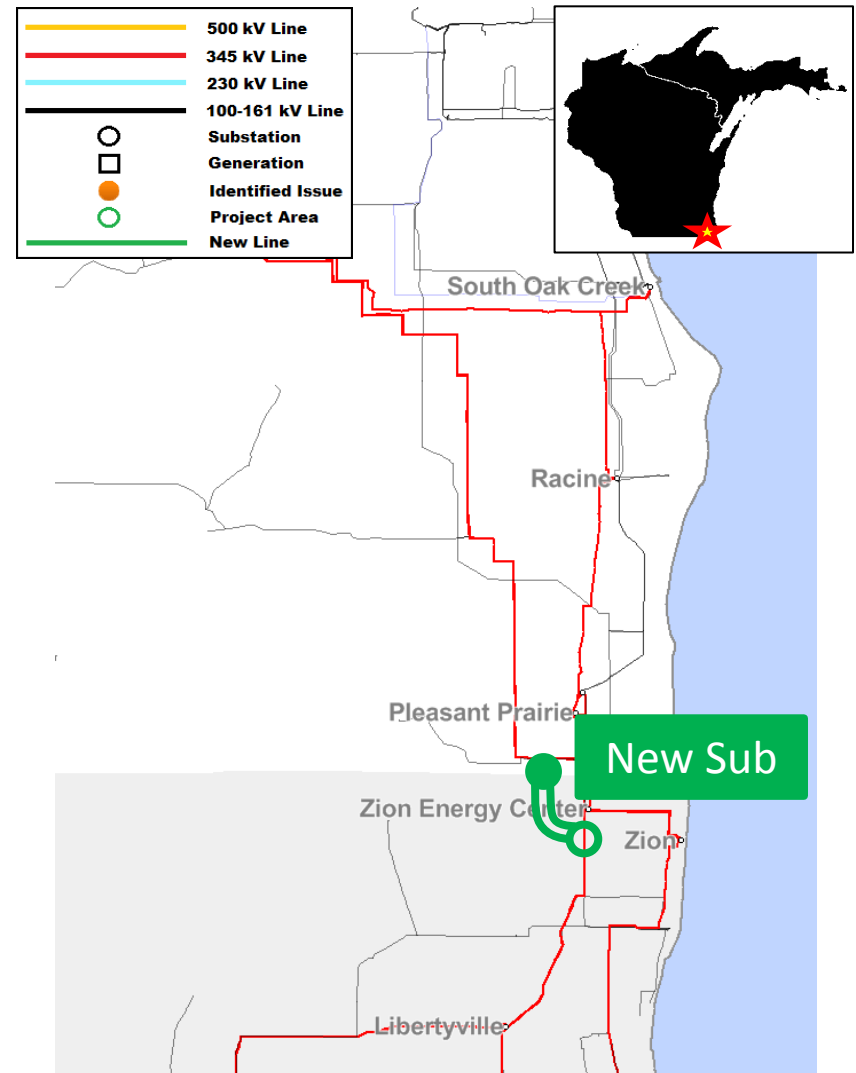
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ATC Recommended Appendix A in MTEP15 Projects

No Update since SPM2

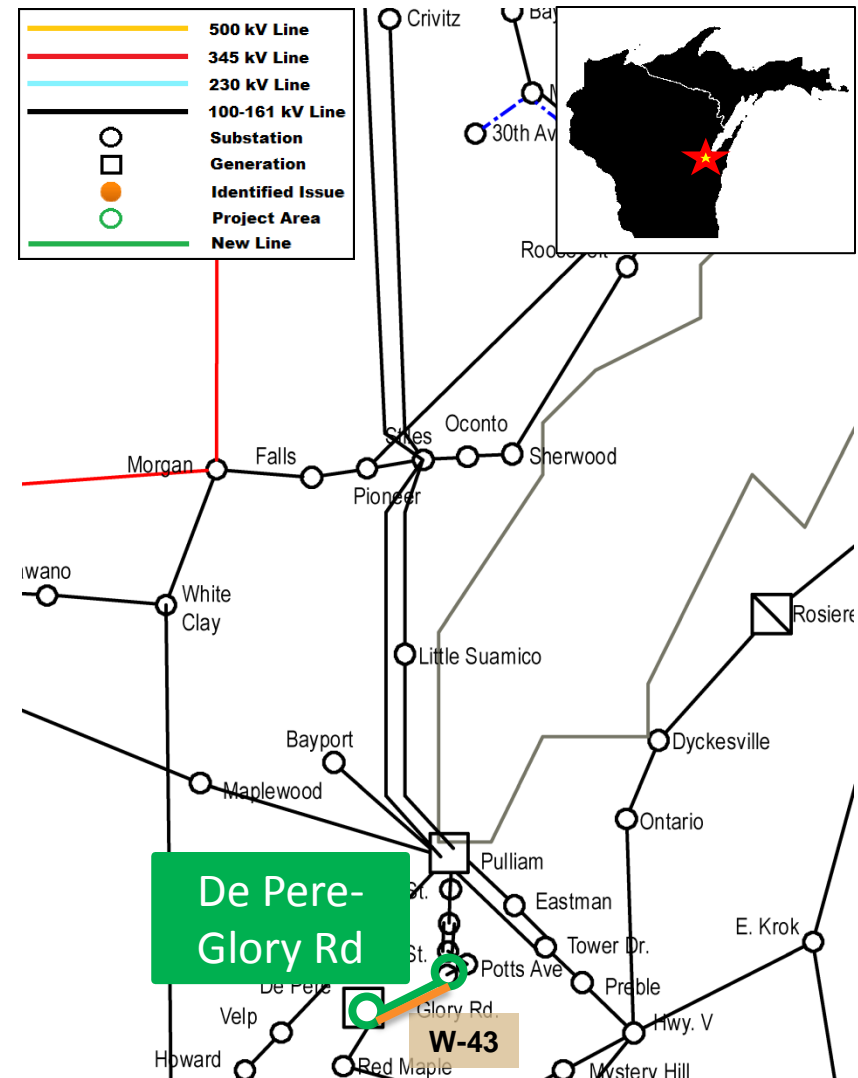
ATC: P8065

- **Construct Southeast Wisconsin - Northeast Illinois 345 kV transmission reinforcement**
 - Reconfigure the Pleasant Prairie-Arcadian 345 kV and Zion-Libertyville 345 kV transmission lines to loop into a new 4 position breaker-and-a-half 345 kV Switching Station
- **Estimated Cost: \$52.0M**
- **Expected ISD: 2020 Dec**
- **Project Type**
 - Baseline Reliability
- **System Needs**
 - System reliability; gain a third Pleasant Prairie-Zion 345 path; mitigate N-2 Real Time needs



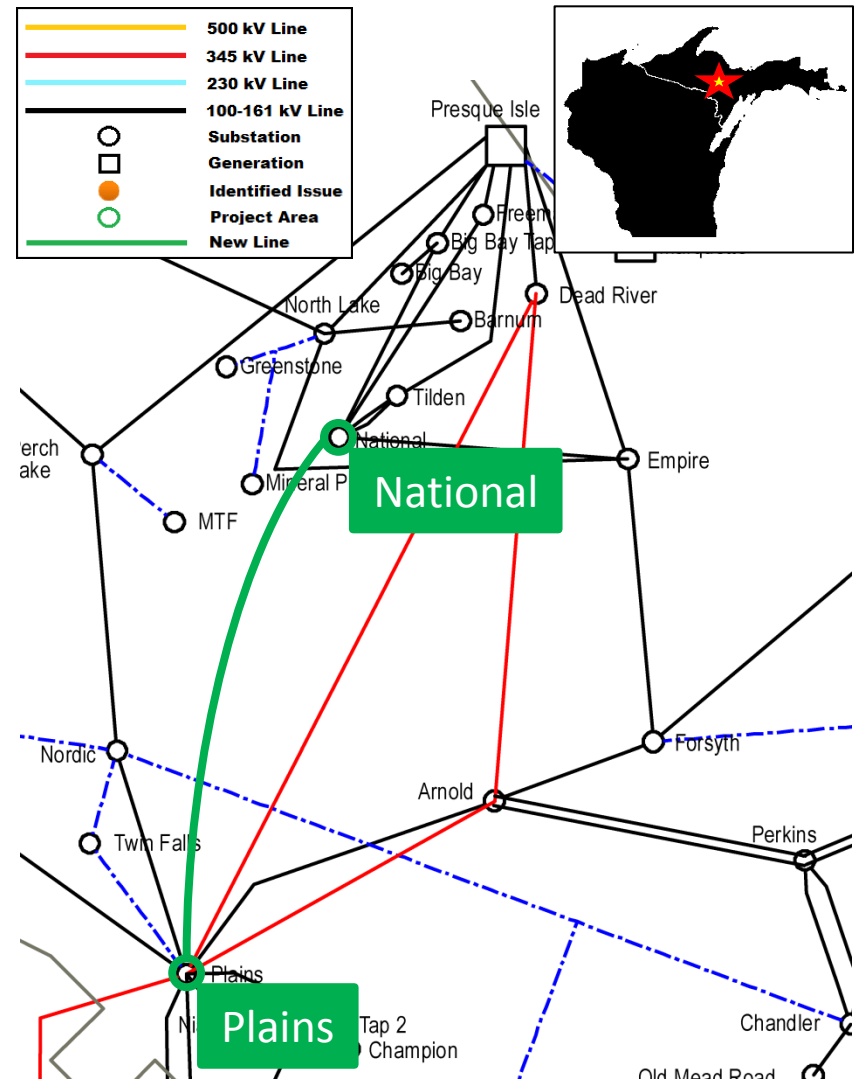
ATC: P9081

- **Reconductor De Pere - Glory Road 138 kV**
 - Reconductor R122 De Pere - Glory Road 138 kV line
- **Estimated Cost \$500k**
- **Expected ISD 2020 Dec**
- **Project Type**
 - Baseline Reliability
- **MISO identified needs**
 - 109% for a P6, P7 (W-43)
 - Refer to the Issues_Tracker.xlsx for a complete list of MISO identified issues
- **Targeted Appendix**
 - Escalated from Target B to Target A in MTEP15

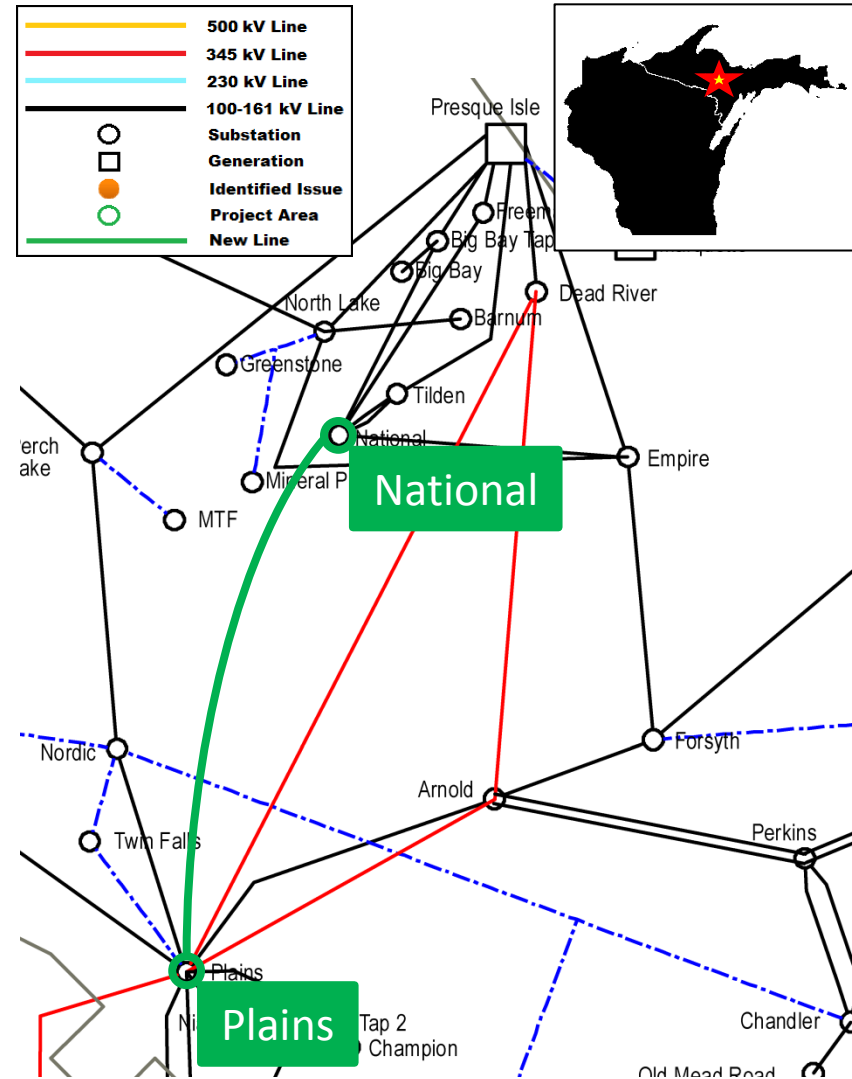
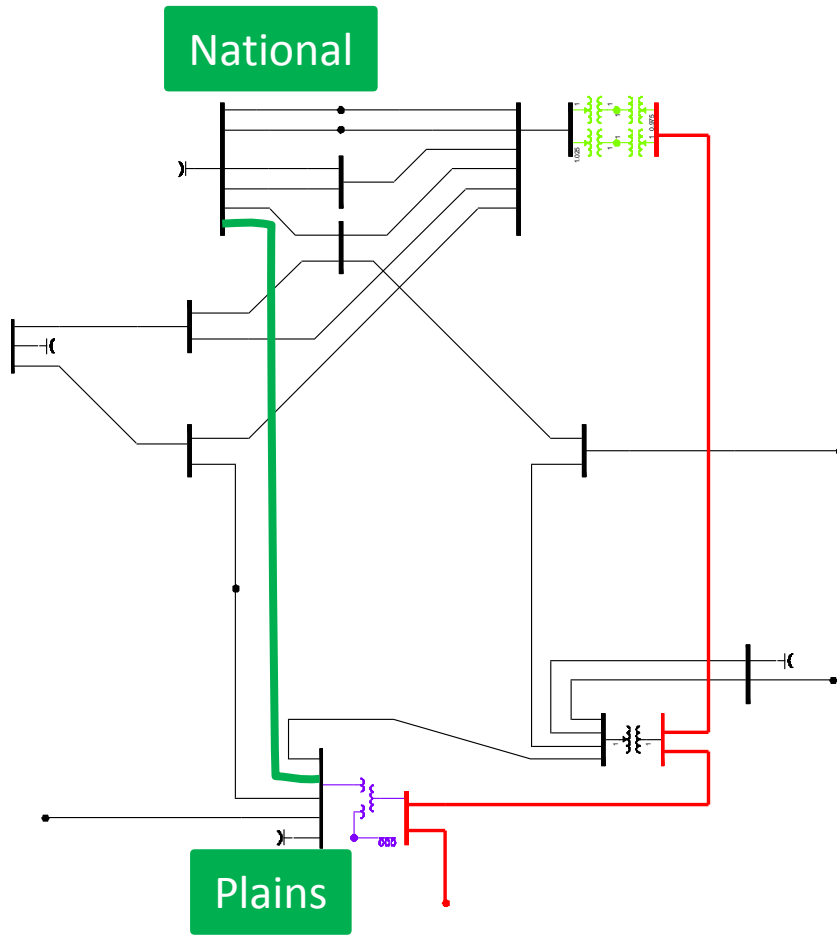


ATC: P8071

- **Construct Plains-National 138 kV**
 - New Plains-National 138 kV line on new ROW
- **Estimated Cost \$114M**
- **Expected ISD 2020 Dec**
- **Project Type**
 - Baseline Reliability
- **MISO identified needs**
 - Multiple needs appear in generator retirement scenarios

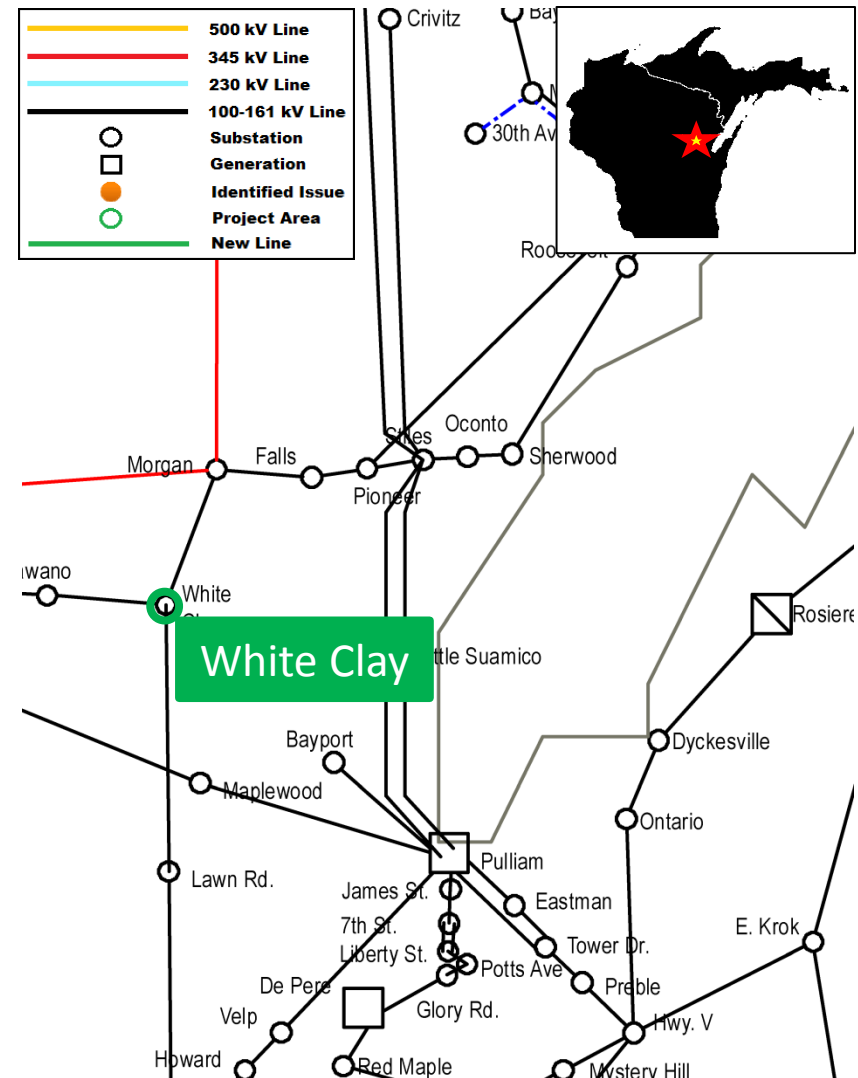


ATC: P8071

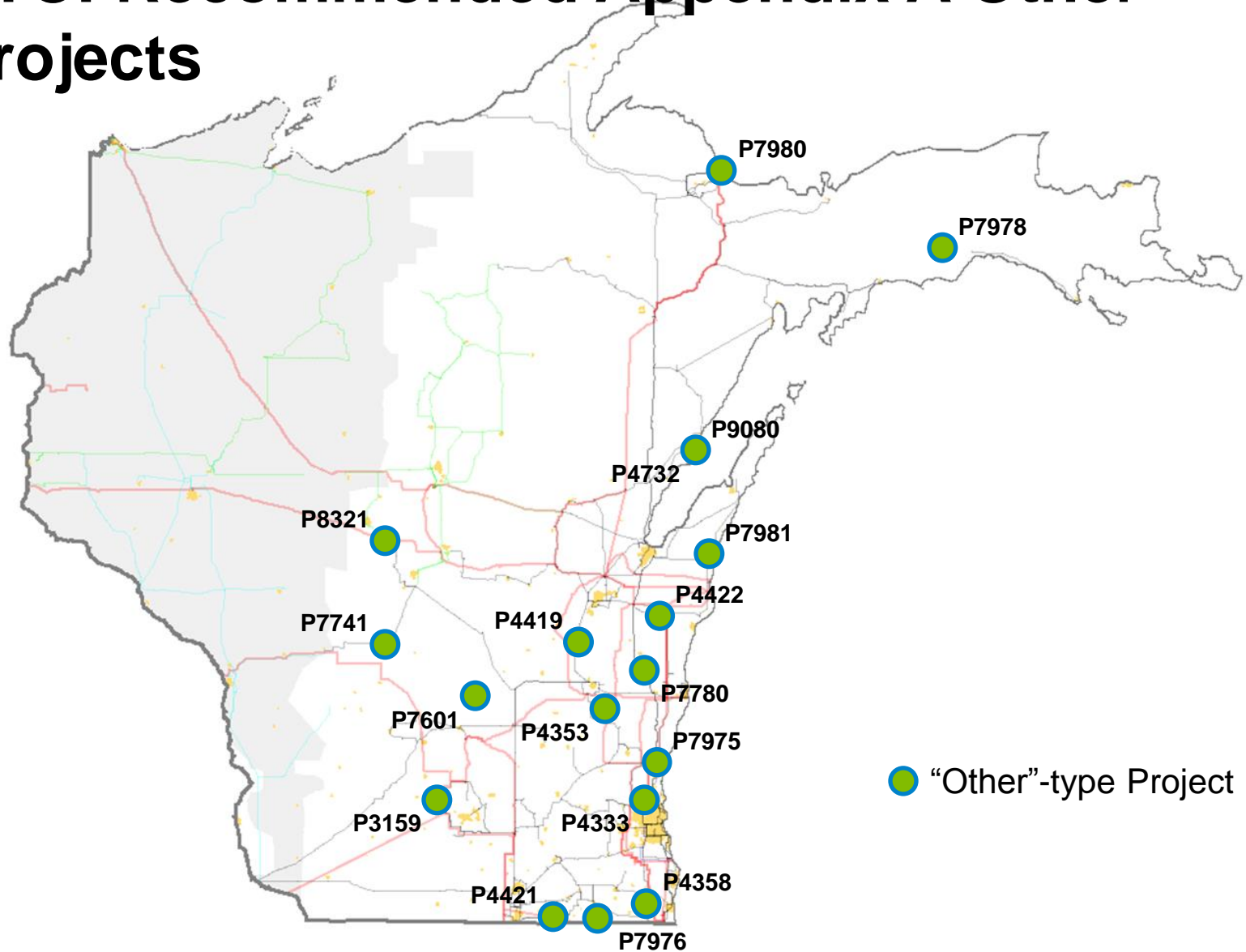


ATC: P7582

- **Reconductor White Clay Bus**
 - Reconductor White Clay strain bus with 1590 AAC.
 - Replace bus tie switch and OCBs to NAP and Morgan.
- **Estimated Cost \$1.3M**
- **Expected ISD 2015 Dec**
- **Project Type**
 - Baseline Reliability
- **System needs**
 - Asset Renewal, breaker and switch replacement
 - Bus overloads in generator retirement scenarios



ATC: Recommended Appendix A Other Projects



ATC: Other A in MTEP15 upgrades

Type	ID	Project Name	Project Description	Est ISD	Cost	Prj Type
T-D projects	4358	Construct Berryville 138 kV T-D	Add new load at Berryville 138 kV substation and associated network upgrades	2015 Oct	\$4.0 M	Other Distribution
	4422	Construct Foundry Iron 138/69 kV substation and extend M-65 69 kV line	Loop Shoto-Glenview 138 kV line into new 138/69/12.47 kV Foundry substation; Install a 138/69 kV transformer; Extend Glenview 69 kV line to new 69 kV bus	2016 Aug	\$12.9 M	Other Distribution
	4353	Construct Creekview 138 kV T-D	New load at Creekview 138 kV substation; Associated network upgrades	2017 June	\$16.0 M	Other Distribution
	7780	Construct Esker View 138 kV T-D	Build new 138/24.9 kV distribution substation	2016 Apr	\$5.7 M	Other Distribution
	4421	Construct Williams Bay 138 kV Substation	Loop Elkhorn-Brick Church 138 kV line in and out of Williams Bay; Install distribution transformer; Add two 138 kV line breakers	2017 July	\$4.2 M	Other Distribution
	8321	Construct Richfield 115 kV T-D	Tap Mill Creek-Arpin 115 kV for T-D request	2015 Aug	\$694 k	Other Distribution
	4732	Construct Ogden Street 69 kV Networking Project	Construct a new 69 kV line from Ogden St.-Bayshore; Rebuild Bayshore-2nd St.-Fiber switching structure; Rebuild Ogden St-Wells St.; Install two line breakers at Ogden St.	2018 June	\$10.6 M	Other Distribution

ATC: Other A in MTEP15 upgrades

Type	ID	Project Name	Project Description	Est ISD	Cost	Prj Type
Bus Rebuilds	4419	Uprate Sunset Point jumpers	Uprate the jumpers of 138 kV lines Sunset Point-Mears Corners and Sunset Point-Ellinwood	2016-Jun	\$100 k	BaseRel
	7978	Reconfigure 69 kV Blaney Park substation	Add a bus tie and two line breakers at Blaney Park to break up line	2016-Mar	\$3.1 M	Other Reliability
Breakers	7981	Rebuild Beardsley St 69 kV Substation	Sectionalize J-10 circuit	2016-Oct		Other Reliability
	7741	Install Dellwood Line Breakers 69 kV	Install breakers and cap bank at Dellwood 69 kV; Remove remove mobile cap bank at McKenna.	2016-Dec	\$3.1 M	Other Reliability
	7601	Install Montello 69 kV breakers	Add line breakers at Montello 69 kV; add 8 Mvar capacitor at Montello 69 kV; remove mobile capacitor at Lakehead Portage	2016-Jun	\$3.2 M	Other Reliability
	9080	Install W. Marinette 138-69 kV transformer high-side protection	Install high side breakers on existing 138/69 kV transformer	2020-Dec	\$4.5 M	Other Reliability
	7976	Install 69 kV breakers at Katzenberg	Add two 69 kV, 2000 A circuit breakers at Katzenberg, sectionalizing line Y-51-ALE	2015-Mar	\$3.5 M	Other Reliability
Relays	7980	Install 138 kV Presque Isle Redundant Bus Differentials	Install four new dual SEL-487B bus differential relay panels	2015-Dec	\$550 k	Other Reliability
	7975	Install 138 kV Saukville Redundant Bus Differentials	Eliminate the C-9 contingency for the Saukville 138 kV bus	In service	\$510 k	Other Reliability

ATC: Other A in MTEP15 upgrades

Type	ID	Project Name	Project Description	Est ISD	Cost	Prj Type
Line Upgrades	4333	Rebuild Granville-Butler 138 kV	Uprate the Granville - Butler 138 kV line replacing some structures and re-conductoring the line with 959.6 kcmil ACSS/TW	In service	\$5.6 M	Other Economic
	3159	Uprate West Middleton-Stage Coach 69 kV	West Middleton-Timberlane-Stage Coach 69 kV line uprate	2018 Dec	\$874 k	Other Reliability

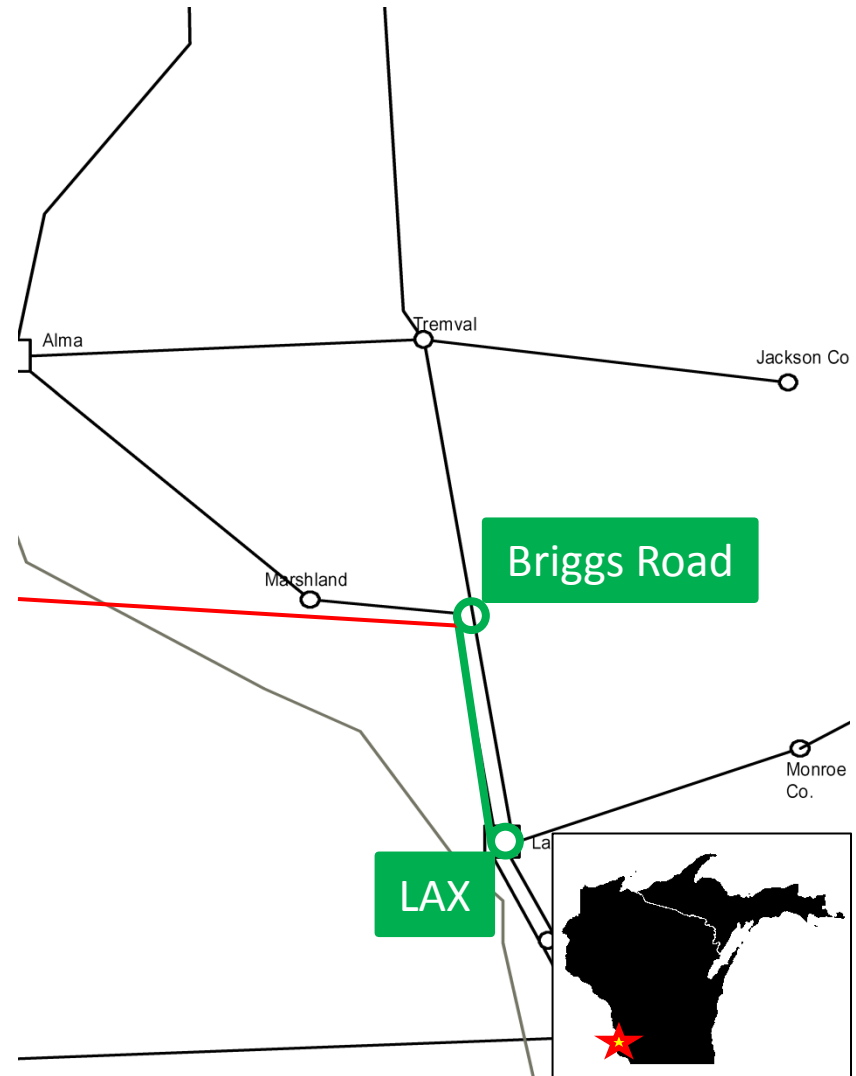
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Dairyland Power Cooperative Review of reliability projects under consideration

3rd West Sub-regional Planning Meeting
June 27, 2015

DPC: P7664

- **Rebuild Briggs Road-La Crosse Tap 161 kV**
 - Rebuild the Briggs Road-La Crosse Tap 161 kV line on the existing ROW
 - Replace poles
 - Install 795 ACSS conductor
- **Estimated Cost \$12.1M**
- **Expected ISD 2016 June**
- **Preliminary Project Type**
 - Other Reliability
- **System Needs**
 - The line is 62 years old, experiencing increased maintenance costs due to its age, and needs replacement.



Contact

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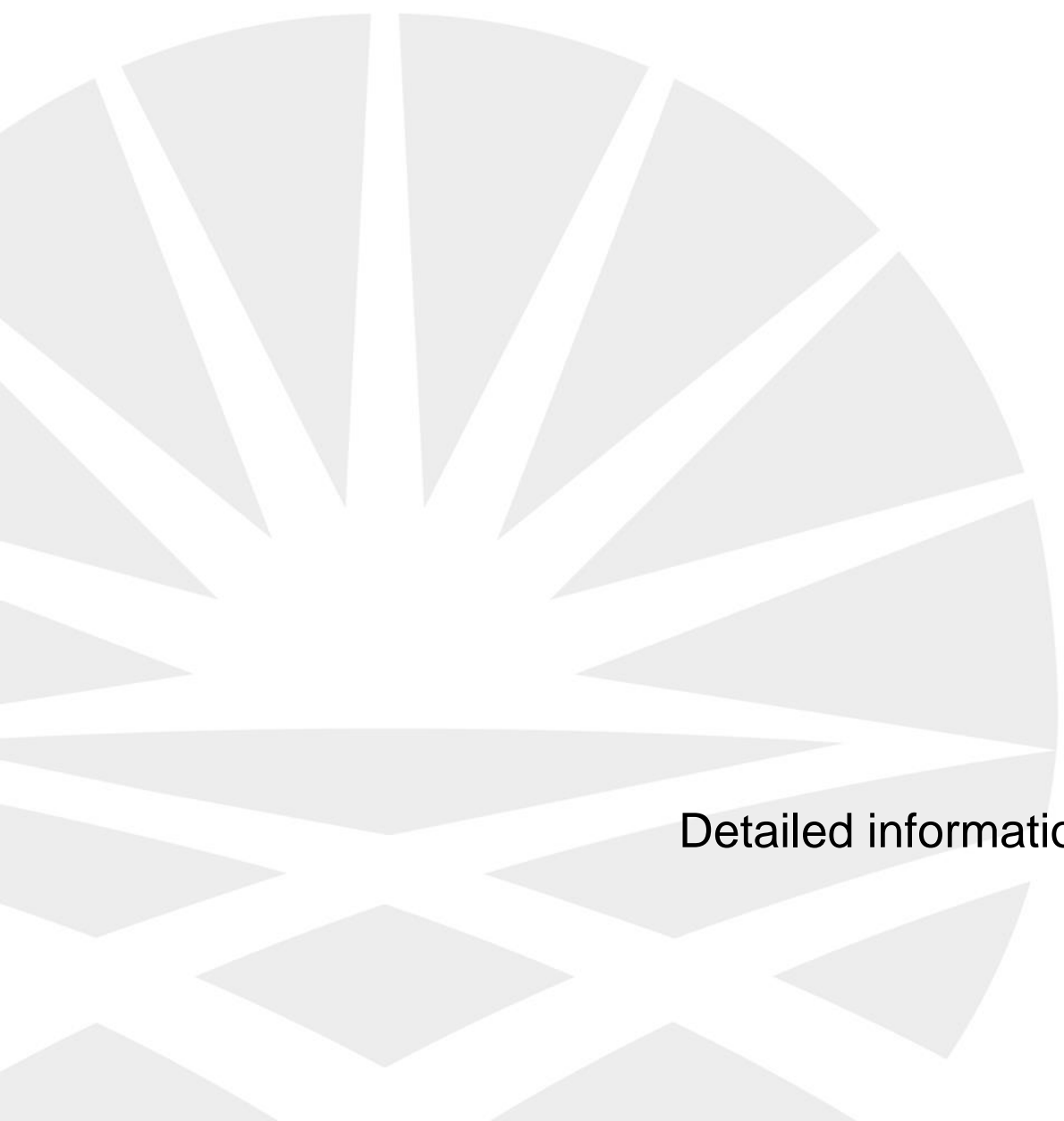
651.632.8430

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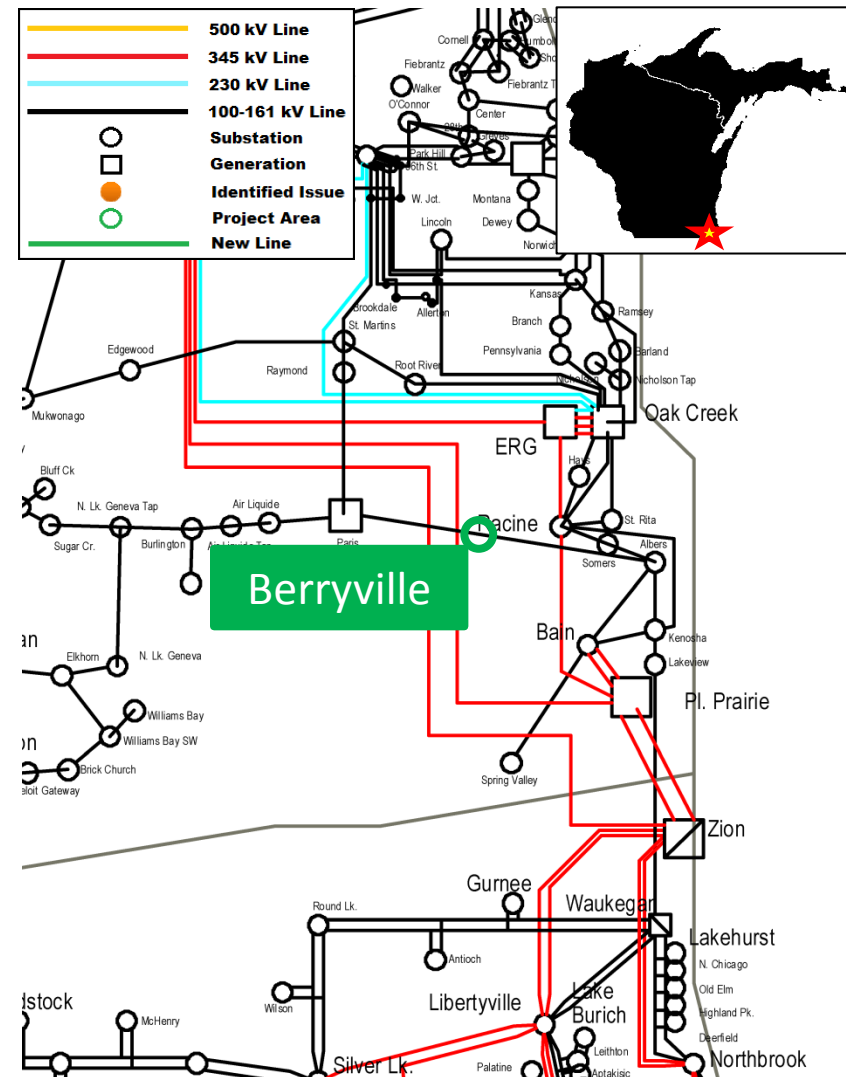


Appendix:

Detailed information on Other type projects

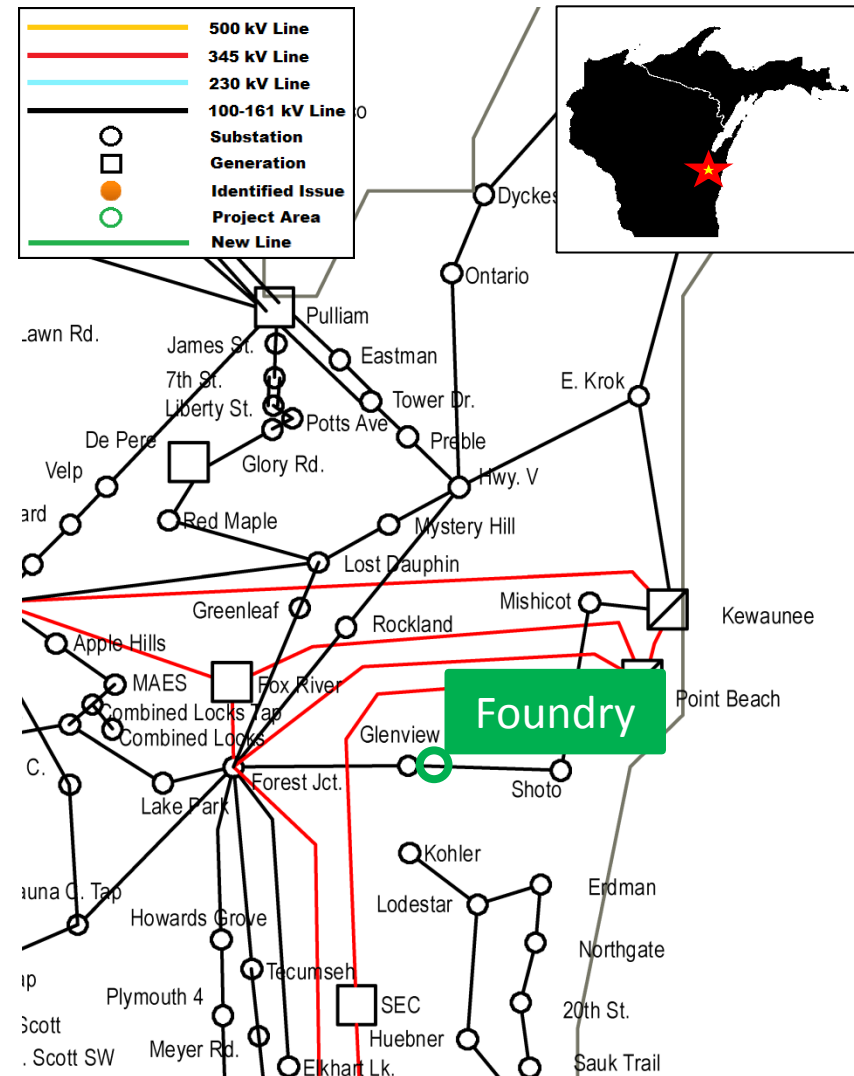
ATC: P4358

- **Construct Berryville 138 kV T-D**
 - Add new load at Berryville 138 kV substation and associated network upgrades
- **Estimated Cost: \$4.0M**
- **Expected ISD: 2015 Oct**
- **Project Type**
 - Other Distribution
- **System Needs**
 - T-D Interconnection



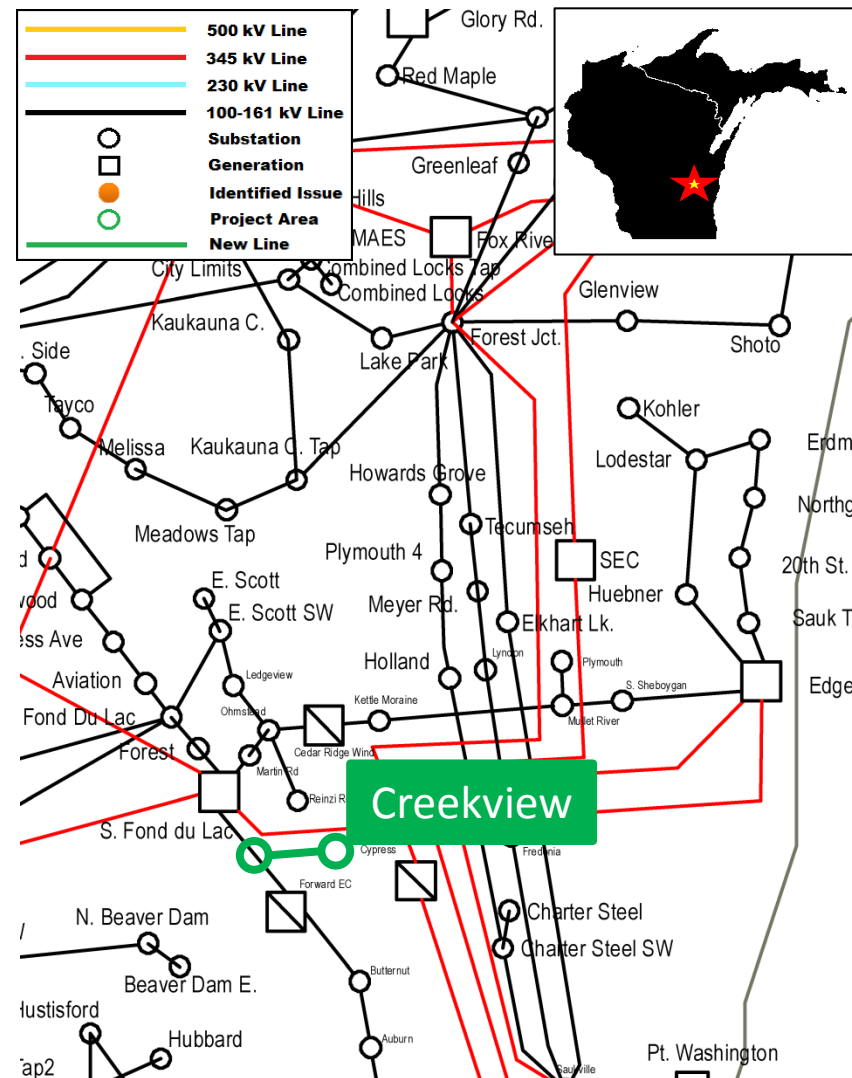
ATC: P4422

- **Construct Foundry Iron 138/69 kV substation and extend M-65 69 kV line**
 - Loop Shoto-Glenview 138 kV line into new 138/69/12.47 kV Foundry Iron substation
 - Install a 138/69 kV transformer
 - Extend Glenview 69 kV line to new 69 kV bus
- **Estimated Cost \$12.9M**
- **Expected ISD 2016 Aug**
- **Project Type**
 - Other Distribution
- **System Needs**
 - T-D Interconnection



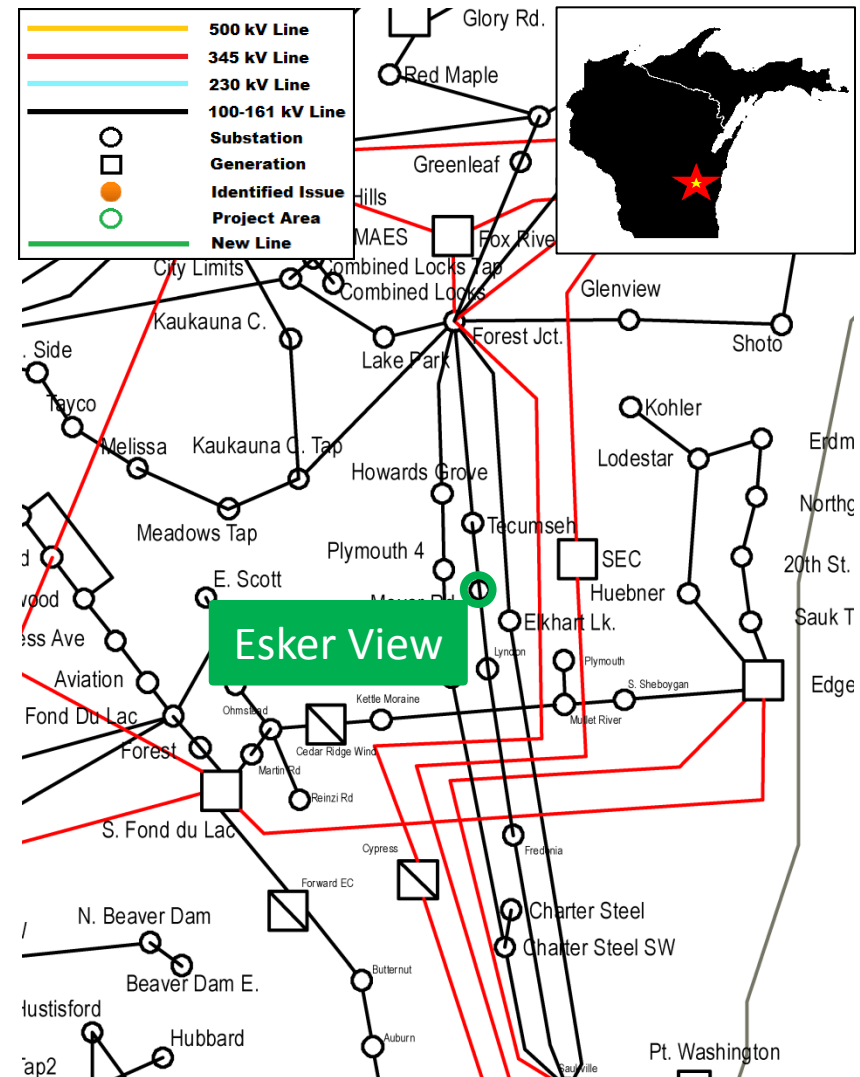
ATC: P4353

- **Construct Creekview 138 kV T-D**
 - New load at Creekview 138 kV substation
 - Associated network upgrades
- **Estimated Cost \$16.0M**
- **Expected ISD 2017 June**
- **Project Type**
 - Other Distribution
- **System Needs**
 - T-D Interconnection



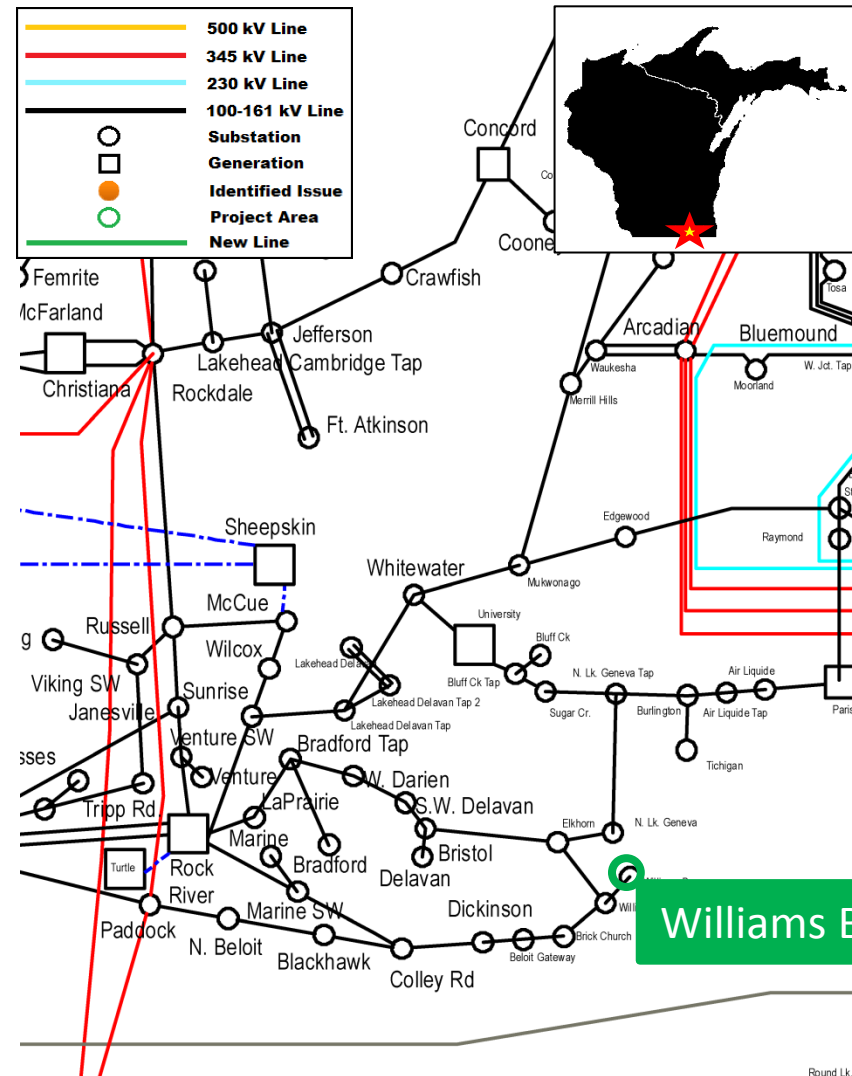
ATC: P7780

- **Construct Esker View 138 kV T-D**
 - Build new 138/24.9 kV distribution substation
- **Estimated Cost \$5.7M**
- **Expected ISD 2016 Apr**
- **Project Type**
 - Other Distribution
- **System Needs**
 - T-D Interconnection



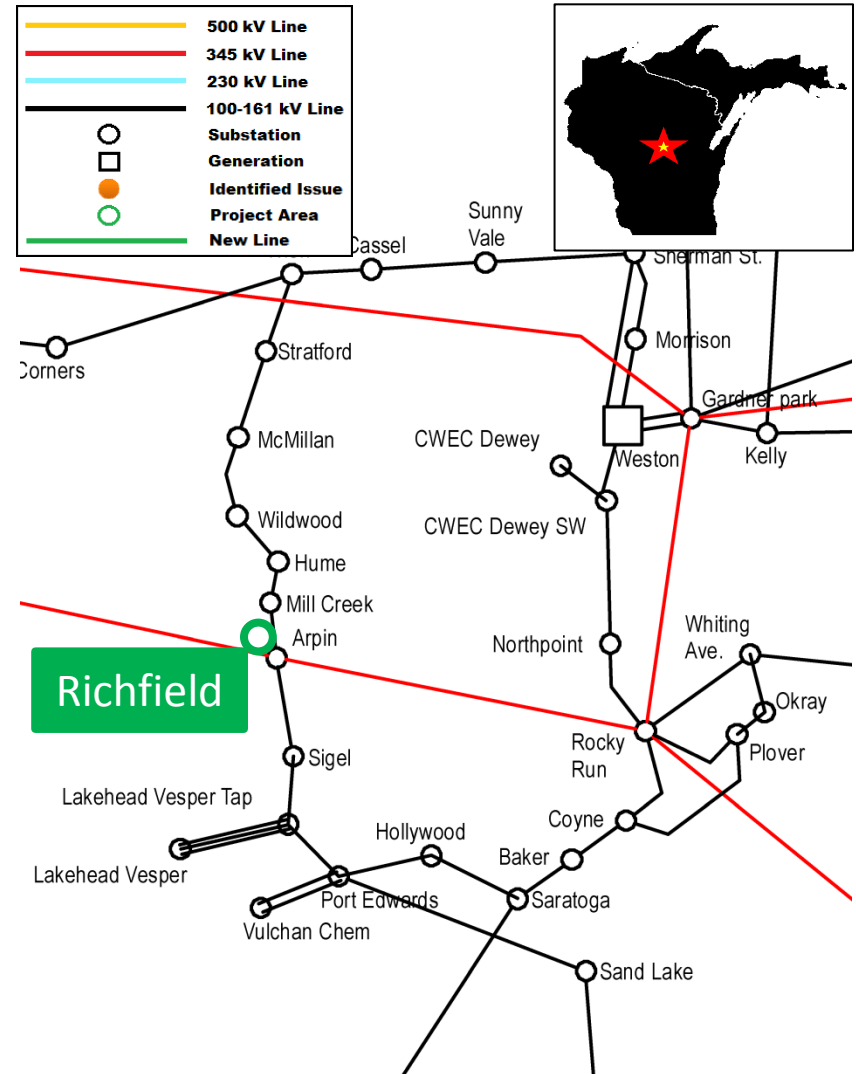
ATC: P4421

- **Construct Williams Bay 138 kV Substation**
 - Loop Elkhorn-Brick Church 138 kV line in and out of Williams Bay
 - Install distribution transformer
 - Add two 138 kV line breakers
- **Estimated Cost \$4.2M**
- **Expected ISD 2017 July**
- **Project Type**
 - Other Distribution
- **System Needs**
 - T-D Interconnection



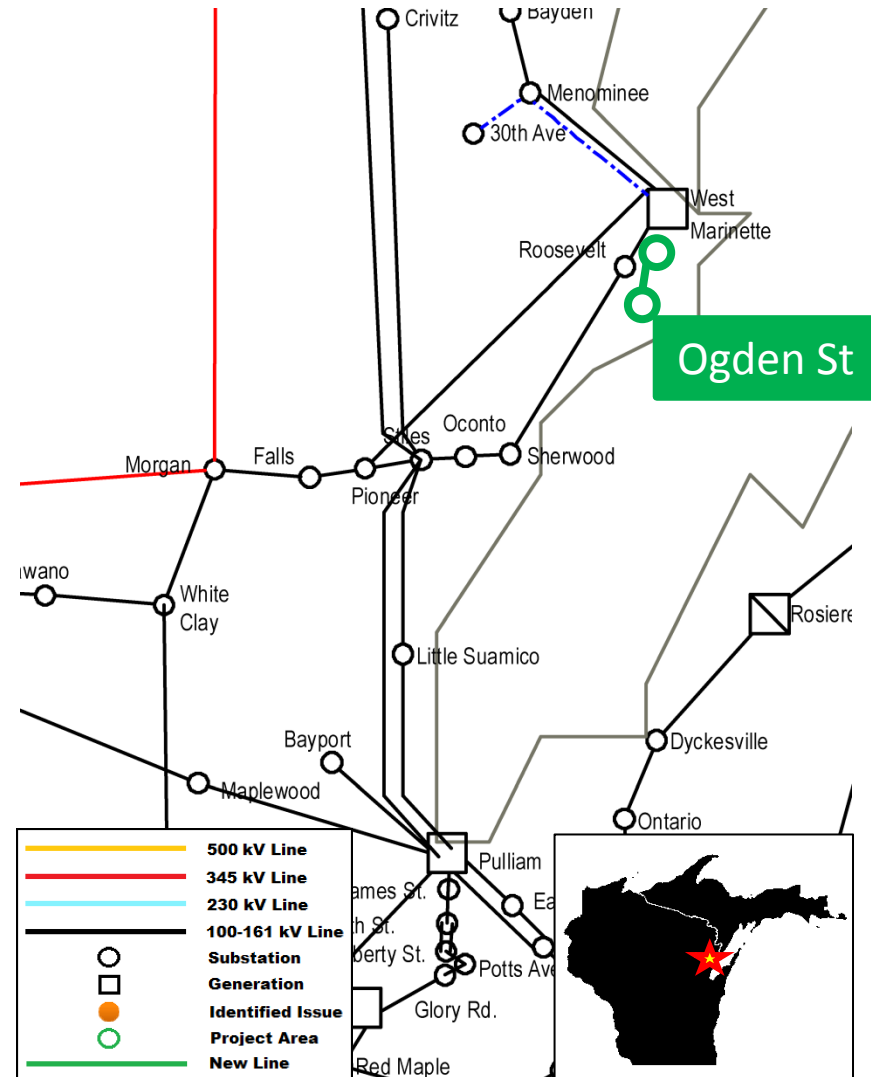
ATC: P8321

- **Construct Richfield 115 kV T-D**
 - Tap Mill Creek-Arpin 115 kV for T-D request.
- **Estimated Cost \$694k**
- **Expected ISD 2015 Aug**
- **Project Type**
 - Other Distribution
- **System Needs**
 - T-D interconnection



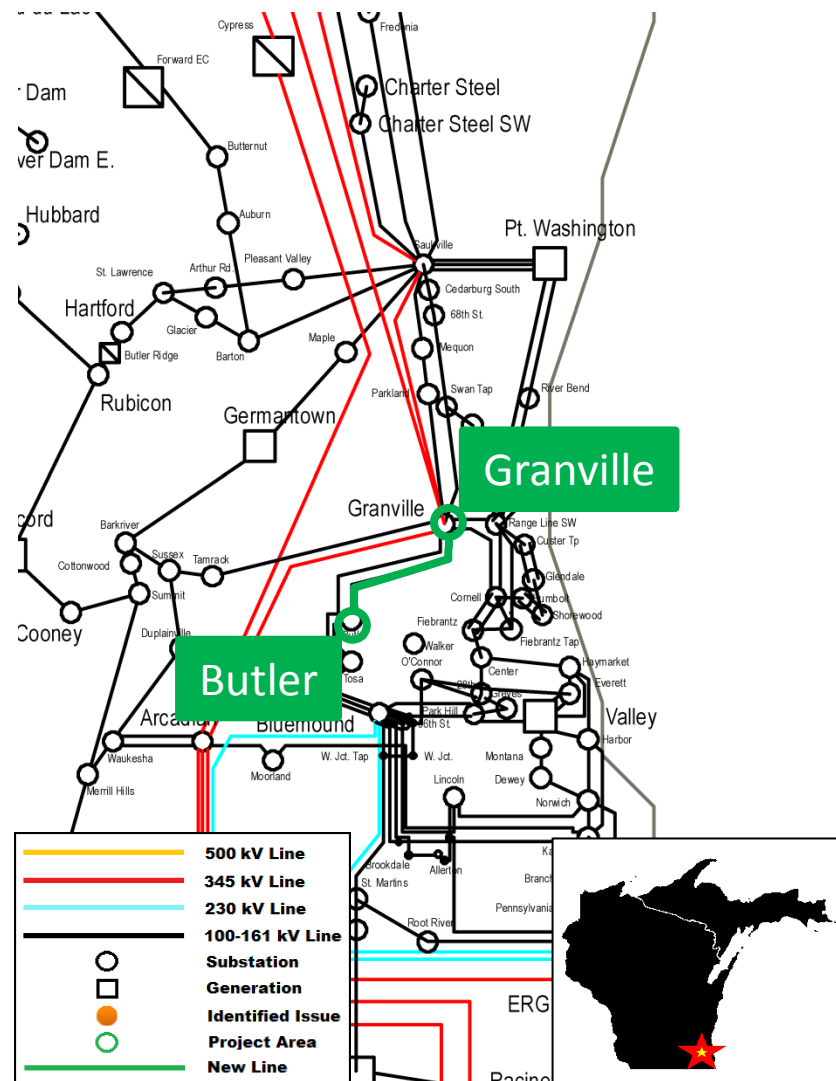
ATC: P4732

- **Construct Ogden Street 69 kV Networking Project**
 - Construct a new 69 kV line from Ogden St.-Bayshore
 - Rebuild Bayshore-2nd St.-Fiber switching structure
 - Rebuild Ogden St-Wells St.
 - Install two line breakers at Ogden St.
- **Estimated Cost \$10.6M**
- **Expected ISD 2018 June**
- **Project Type**
 - Other Distribution
- **System Needs**
 - T-D interconnection



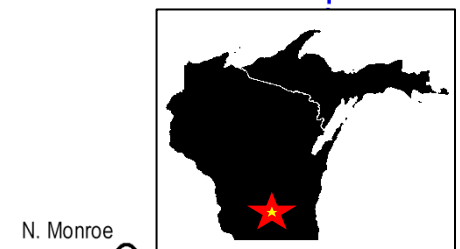
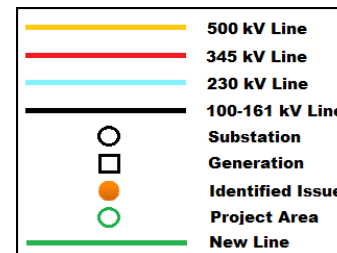
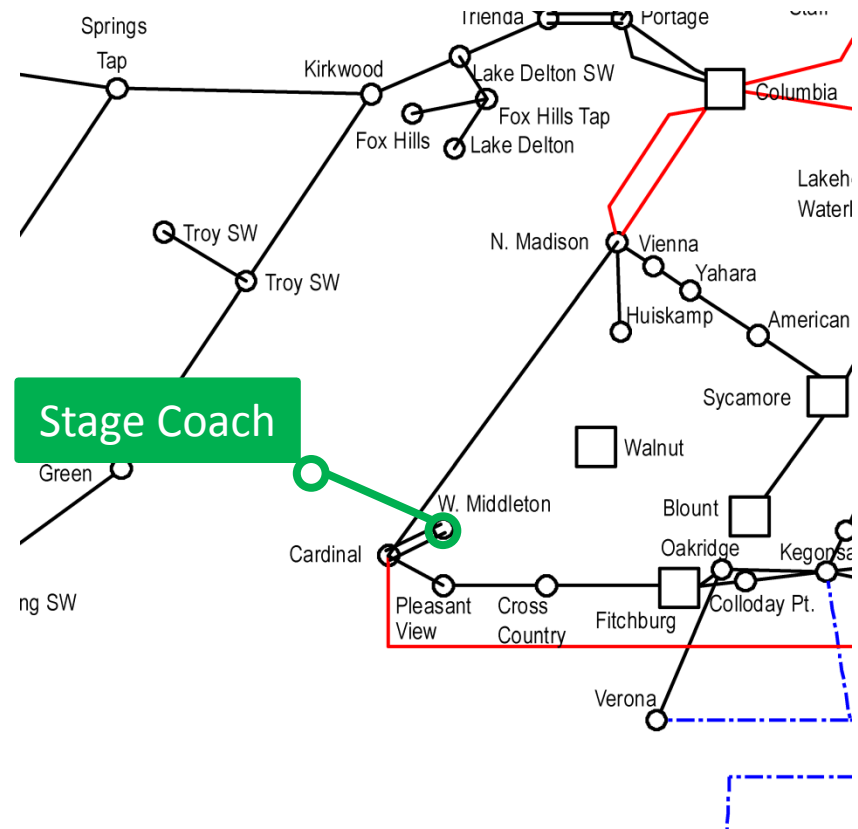
ATC: P4333

- **Rebuild Granville-Butler 138 kV**
 - Uprate the Granville - Butler 138 kV line replacing some structures and re-conductoring the line with 959.6 kcmil ACSS/TW
- **Estimated Cost \$5.6M**
- **Expected ISD In service**
- **Project Type**
 - Other Economic
- **System Needs**
 - System Congestion Relief



ATC: P3159

- **Uprate West Middleton-Stage Coach 69 kV**
 - West Middleton-Timberlane-Stage Coach 69 kV line uprate
- **Estimated Cost \$874k**
- **Expected ISD 2018 Dec**
- **Project Type**
 - Other Reliability
- **MISO identified needs**
 - (W-51)
 - P2 x 3, max overload 101%
 - P6 x 16, max overload 113%



ATC: Target B in MTEP15 projects

Type	ID	Project Name	Project Description	Est ISD	Cost
New construction	3678	Construct Marquette-Mackinac 138 kV	Rebuilds Forsyth to Nine Mile as 138 kV line and rebuilds from Nine Mile to Straits area as 138 kV. This includes a new 138 kV connection between Seney and Roberts.	2050-Dec	\$263 M
	8076	Construct Morgan-Plains Area Reinforcement Project	New Thunder Substation, Loop Morgan - Plains 345 into new Thunder Substation, New Morgan - Thunder 138 kV line, Convert Thunder - Crivitz 69 kV to 138 kV, W. Marinette TR2 breakers	2020-Dec	\$96.1 M
	1719	Construct Shoto-Custer 138 kV line	Construct a Shoto-Custer 138 kV line	2022-Jun	\$23 M
Transformers	7585	Install 2nd Colley Rd 138/69 kV transformer	Add 2nd 138/69 kV transformer at Colley Rd	2023-Jun	\$9.9 M
	7586	Install Atlantic 138/69 kV transformer and reconfigure bus	Reconfigure the Atlantic substations 138 kV and 69 kV bus work. Denergize the existing Atlantic 138/69 kV transformer and install a new 138/69 kV transformer.	2019-Jun	\$9 M
	1718	Install Custer 138/69 kV transformer	Install a 138/69 kV transformer at Custer substation	2022-Jun	\$4.9 M

ATC: Target B in MTEP15 projects

Type	ID	Project Name	Project Description	Est ISD	Cost
Line Upgrades	8073	Construct Plains-Marquette Area Reinforcement Project	Uprate Plains - Arnold 138 kV line and upgrade existing Plains 345/138 kV transformer and install a 2nd Plains 345/138 kV transformer	2020-Dec	\$31 M
	8089	Convert Lakota-Winona 69 kV to 138 kV expand Mass Substation	Convert the existing 69-kV lines from Conover-Mass and Mass-Winona from 69 kV to 138 kV; Modify the existing Mass Substation to accommodate 138-kV buswork and a new 138/69-kV transformer	2021-Dec	\$100 M
	8640	Upgrade City Limits Bus 138 kV	Reconductor the City Limits 138 kV bus.	2017-Dec	
	8082	Construct Green Bay Area Reinforcement Project	Highway V - Preble 138 kV line reconductor	2020-Dec	\$6 M
	8084	Construct Rhinelander Area Reinforcement Project	Uprate Highway 8 - Clear Lake 115 kV line	2020-Dec	\$24 M
	8263	Rebuild Y-45 W. Wisconsin Rapids - Sigel 69 kV	Rebuild Y-45 on existing right of way. No terminal equipment is being replaced.	2021-Dec	\$19 M

ATC: Target B in MTEP15 projects

Type	ID	Project Name	Project Description	Est ISD	Cost
Line Upgrades	7583	Rebuild Lone Rock - Boscobel 69 kV	Rebuild Y-124 from Lone Rock to Boscobel with T2-4/0 ACSR. Includes partial rebuild of Y-78 Lone Rock - Richland Center	2015-Dec	\$42 M
	7584	Rebuild New Holstein - St Nazianz - Custer 69 kV	Rebuild P-68 New Holstien - St Nazianz- Custer 69 kV circuit with T2-4/0 ACSR	2022-Dec	\$16 M
	7600	Rebuild Sheepskin - Stoughton 69 kV	Rebuild Y-12 Sheepskin to Stoughton with T2-4/0 ACSR	2023-Dec	\$11 M
	7765	Rebuild Y-145 Lincoln - McKenna 69 kV	Rebuild Y-145 from Lincoln Pumping Station - McKenna 69 kV with T2 4/0 Penguin conductor.	2023-Dec	
	7762	Rebuild Y-19 Wautoma - Harrison 69 kV	Rebuild Y-19 from Wautoma to Harrison 69 kV with T2 4/0 Penguin conductor.	2023-Dec	
	7763	Rebuild Y-47 Mckenna - Castle Rock 69 kV	Rebuild Y-145 from McKenna - Castle Rock 69 kV with T2 4/0	2023-Dec	
	7764	Rebuild Y-49 Wautoma - Chaffee Creek 69 kV	Rebuild Y-145 from Wautoma - Chaffee Creek 69 kV with T2 4/0	2023-Dec	

ATC: Target B in MTEP15 projects

Type	ID	Project Name	Project Description	Est ISD	Cost
Substation Equipment	7580	Install 138 kV Werner West Reactor	Install a 138 kV 25 Mvar inductor at Werner West	2018-Jun	\$1.5 M
	7581	Install 138 kV Forest Jct Reactor	Install a 138 kV 25 Mvar inductor at Forest Jct	2018-Jun	\$1.8 M
	7983	Install 138/69 kV Canal Breakers	Install Canal 138-69 kV transformer high/low side breaker additions	2017-Jun	
	7986	Install 138/69 kV Highway V Breakers	Install 138-69 kV transformer high/low side breaker additions to T1 and T2.	2018-Jun	
	8101	Install 138 kV Forest Junction Redundant Bus Differentials	This project consists of installing redundant bus differential protection on the Forest Junction 138-kV buses K4 and K8.	2018-Dec	
	7985	Install 138 kV Canal Redundant Bus Differentials	This project consists of installing redundant bus differential protection on the two Canal 138-kV buses. The project will install two new dual SEL-487B bus differential relay panels.	2017-Jun	\$220 k