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CHAPTER 4: LOCAL RELIABILITY PLANNING

4.1 MTEP25 Investment Summary

The MTEP25 portfolio consists of 435 new Appendix A projects (Figure 4.1-1) and represents nearly \$12.4 billion in transmission infrastructure investment for the MISO region. Of these projects, 306 are classified as Other projects, 60 Generator Interconnection Projects, 68 Baseline Reliability Projects, and one Multi-Value Project. The single Multi-Value Project (MVP) is a replacement project from the 2011 MVP portfolio within Northern State Power territory.

Of the \$8.1 billion investment in Other projects, 62% are driven by load growth, 16% by age and condition, and 16% by local reliability. Load growth is the largest driver in MTEP25, with most concentrated in the South (42%) and Central (37%) regions.

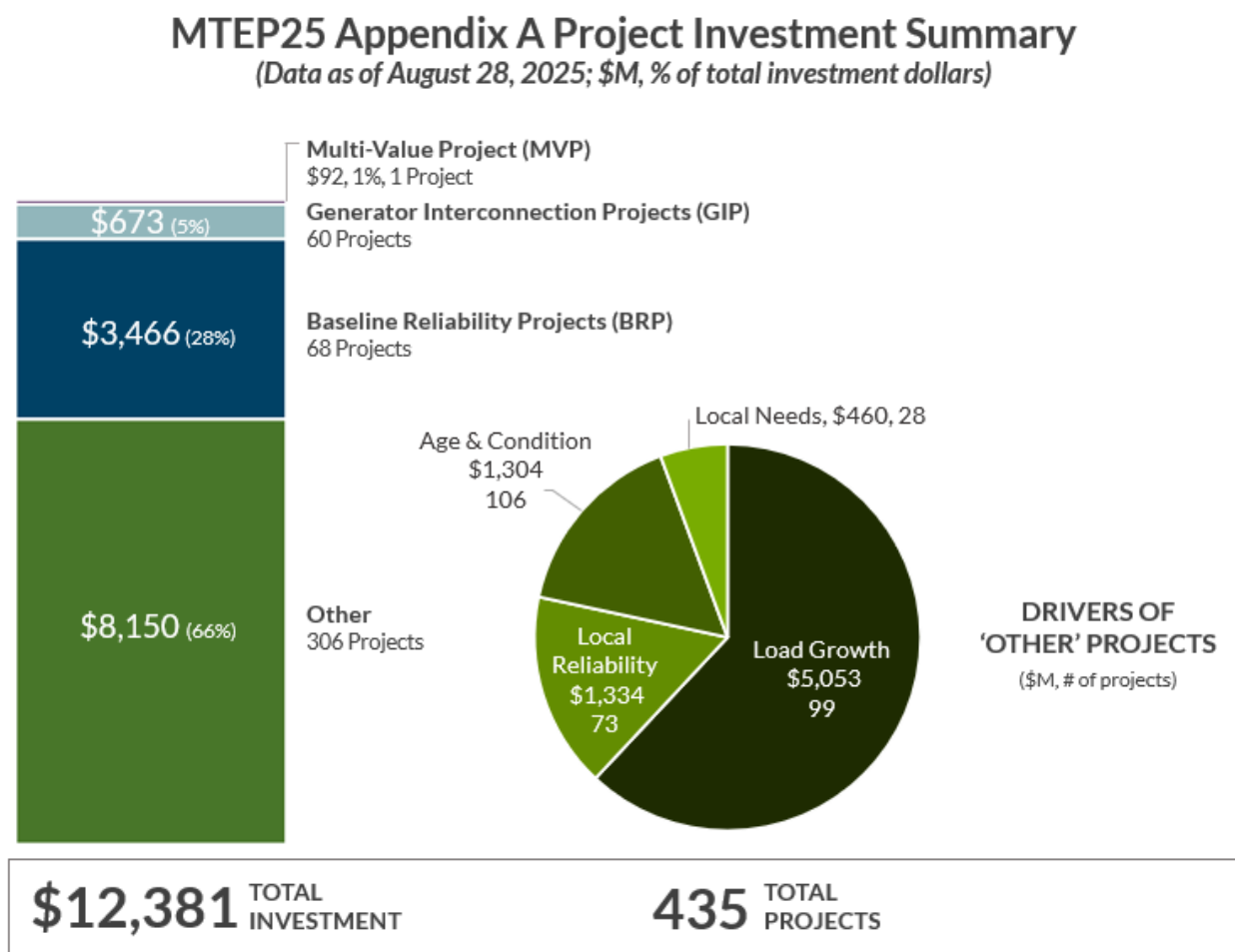


Figure 4.1-1: Appendix A project investment summary (data as of 8-28-2025).



Table 4.1-1 summarizes MTEP25 projects by planning regions, project categories, and number of projects within each region.

MTEP25 Appendix A Project Investment Summary
(Data as of August 28, 2025; \$M, number of projects, and % of total investment dollars)

Planning Region	Baseline Reliability Project (BRP)	Generator Interconnection Project (GIP)	Other Project	Multi-Value Project (MVP)	Total	# of Projects
Central	\$484	\$444	\$2,321	-	\$3,249	137
East	\$76	-	\$515	-	\$591	30
South	\$2,145	\$2	\$2,592	-	\$4,739	50
West	\$761	\$227	\$2,722	\$92	\$3,802	218
Total	\$3,466	\$673	\$8,150	\$92	\$12,381	435

Table 4.1-1: Appendix A project investment summary (data as of 8-28-2025).

The MTEP25 projects are distributed across MISO's entire footprint and reflect several key characteristics (Figure 4.1-2). In total, the portfolio includes 1,934 transmission miles, with 44% representing new line miles, 43% located in the West region, and 30% in the Central region. MTEP25 also consists of transmission to facilitate the reliable interconnection of a record 11.6 GW of spot load additions, of which 9.7 GW were approved through the Expedited Project Review (EPR) process. The portfolio includes 49 approved EPRs, including both original submittals and mitigating transmission projects, accounting for 41% of the total investment, with approximately half of EPR-related investment located in the South specific to Other-Load Growth and a third in the West. Overall, the South accounts for 38% of the total investment, the West 31%, and the Central 26%.



MTEP25 Appendix A Project Highlights

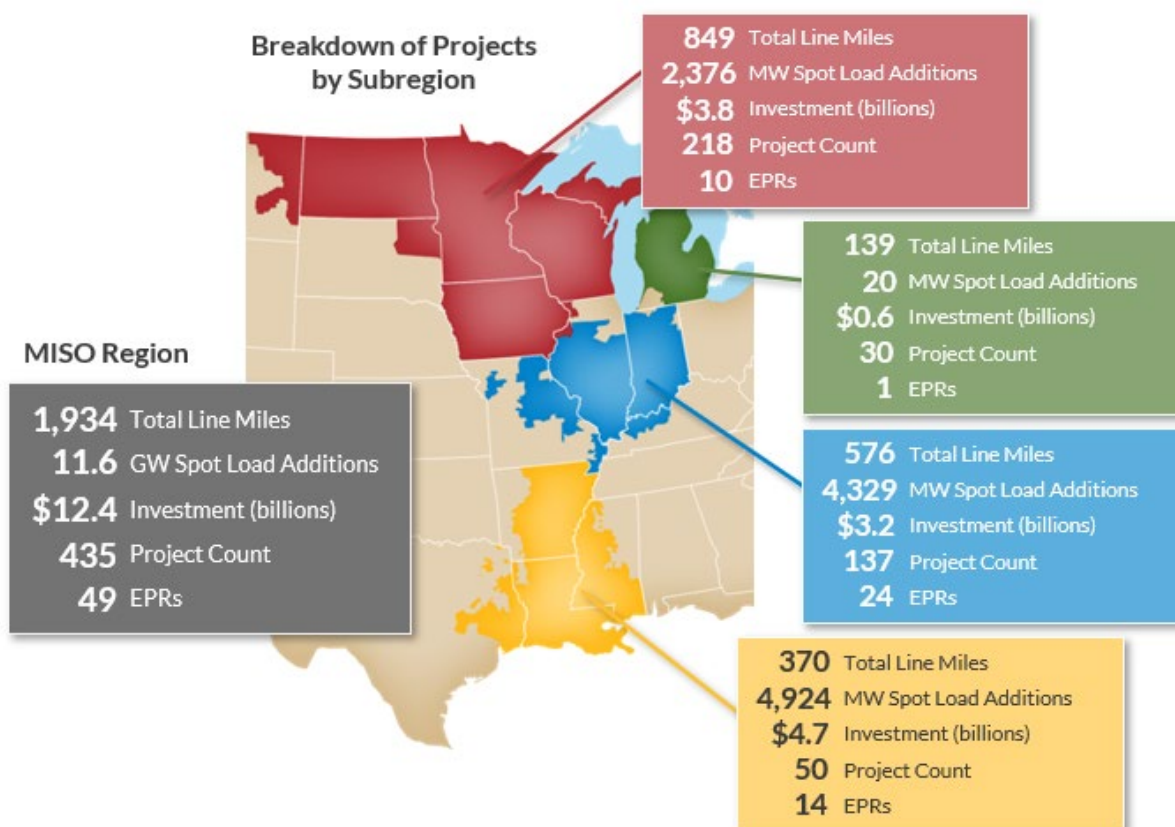


Figure 4.1-2: Appendix A project highlights (data as of 8-28-2025).

Out of the 435 MTEP25 projects submitted in this cycle, MISO Planning Engineers received and evaluated 49 Expedited Project Review (EPR) requests (Figure 4.1-3). These projects are moved through a streamlined approval process because of immediate system needs. More information on these projects is included in Section 4.2. The volume of EPRs continue to be driven by the accelerating new load growth trends, consistent in previous MTEP cycles.

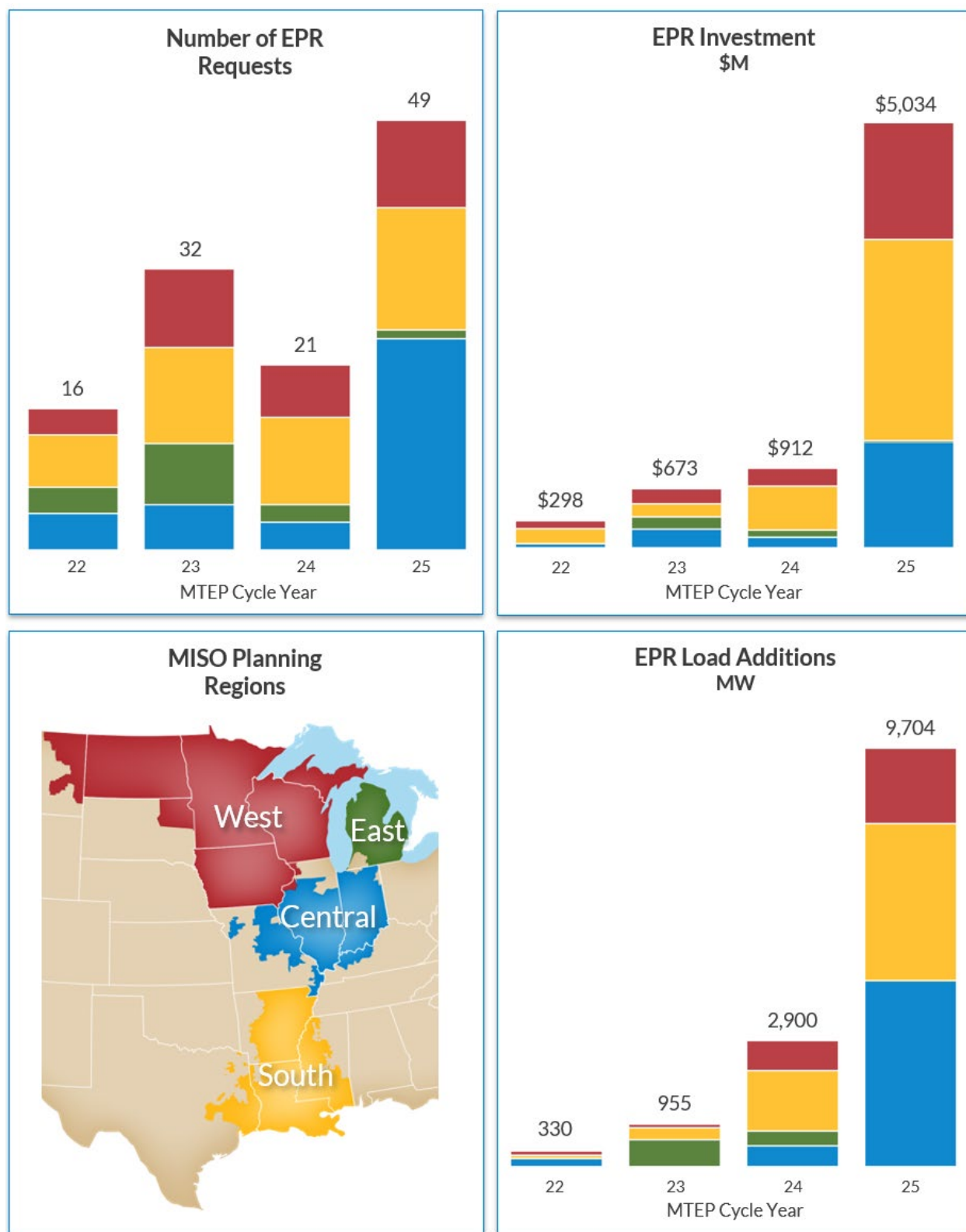


Figure 4.1-3: History on projects studied through the Expedited Project Review (EPR) process.



Within MTEP25 projects, the top ten projects represent roughly 44%, or \$5.4 billion of the total \$12.4 billion investment and are in three of the four planning regions (Figure 4.1-4). Out of the top ten projects, 60% are Other – Load Growth projects, 70% were submitted through the Expedited Project Review process and 50% are in the South.

Top 10 MTEP25 Appendix A Projects

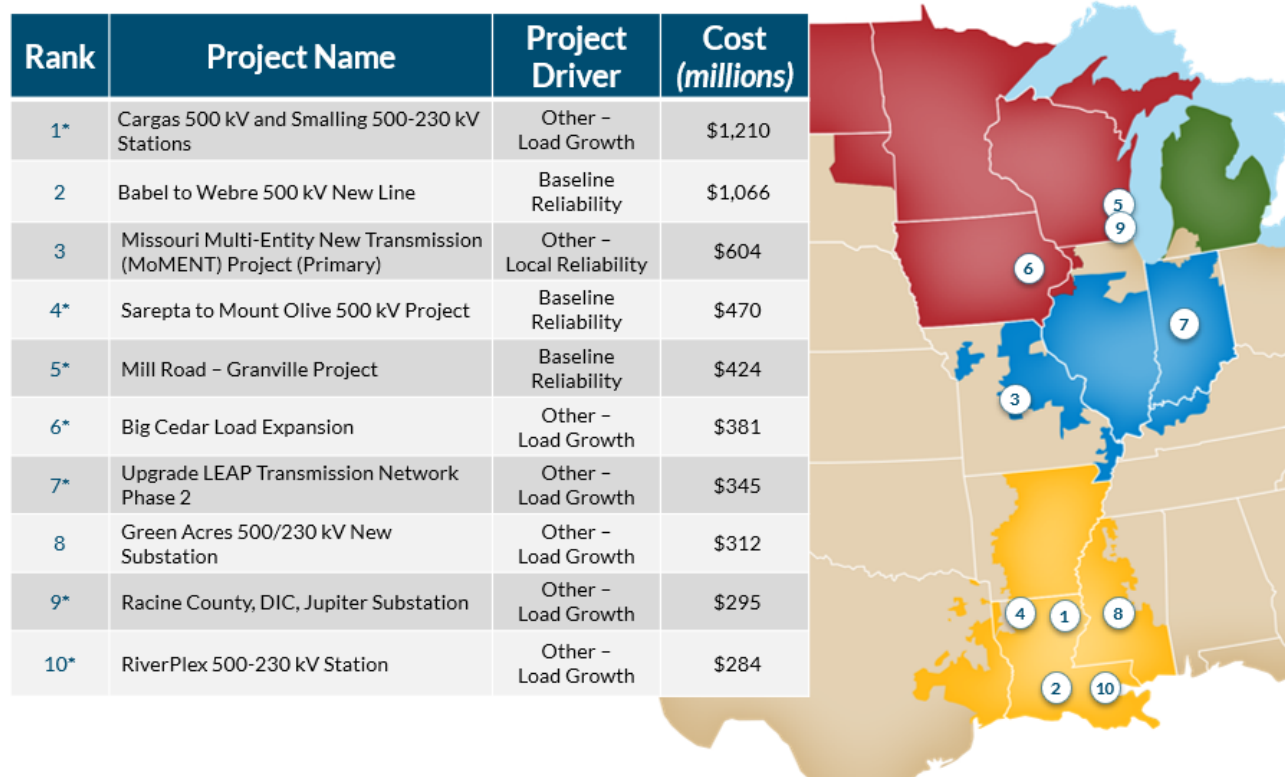


Figure 4.1-4: List of top ten MTEP25 projects as of August 28, 2025, blanket renewal projects excluded from ranking, and * represents projects studied through Expedited Project Review (EPR) process.

Of the total projects for MTEP25, 73% percent are projected to go into service within the next three years (Figure 4.1-5).

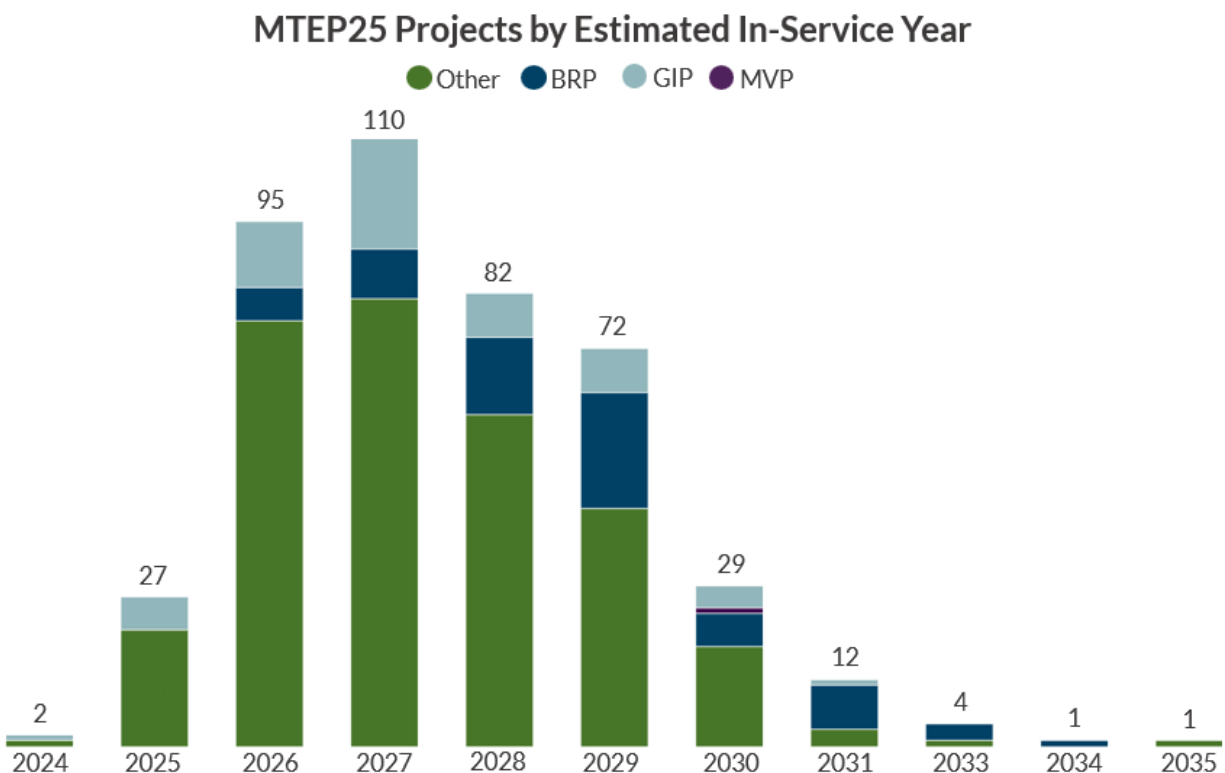


Figure 4.1-5: Number of MTEP25 Projects by In-Service Year (data as of 8-28-25).

Facility Type

Each MTEP project is composed of one or more facilities, where each facility represents an individual element of the project. Examples of facilities include substations, transformers, voltage devices, circuit breakers or various types of transmission lines (Figure 4.1-6).

The largest share (41%) of facility investment in the MTEP25 cycle is dedicated to substation or switching station related construction and maintenance. This includes completely new substations as well as terminal equipment work, circuit breaker additions and replacements. Twenty-five percent is dedicated to new lines on new right-of-way in MISO. Twenty-one percent is dedicated to line upgrades which includes rebuilds, conversions, and relocations. The remaining 13% of facility costs are dedicated between voltage devices, transformers, and miscellaneous categories.



MTEP25 Transmission Investment by Facility Type

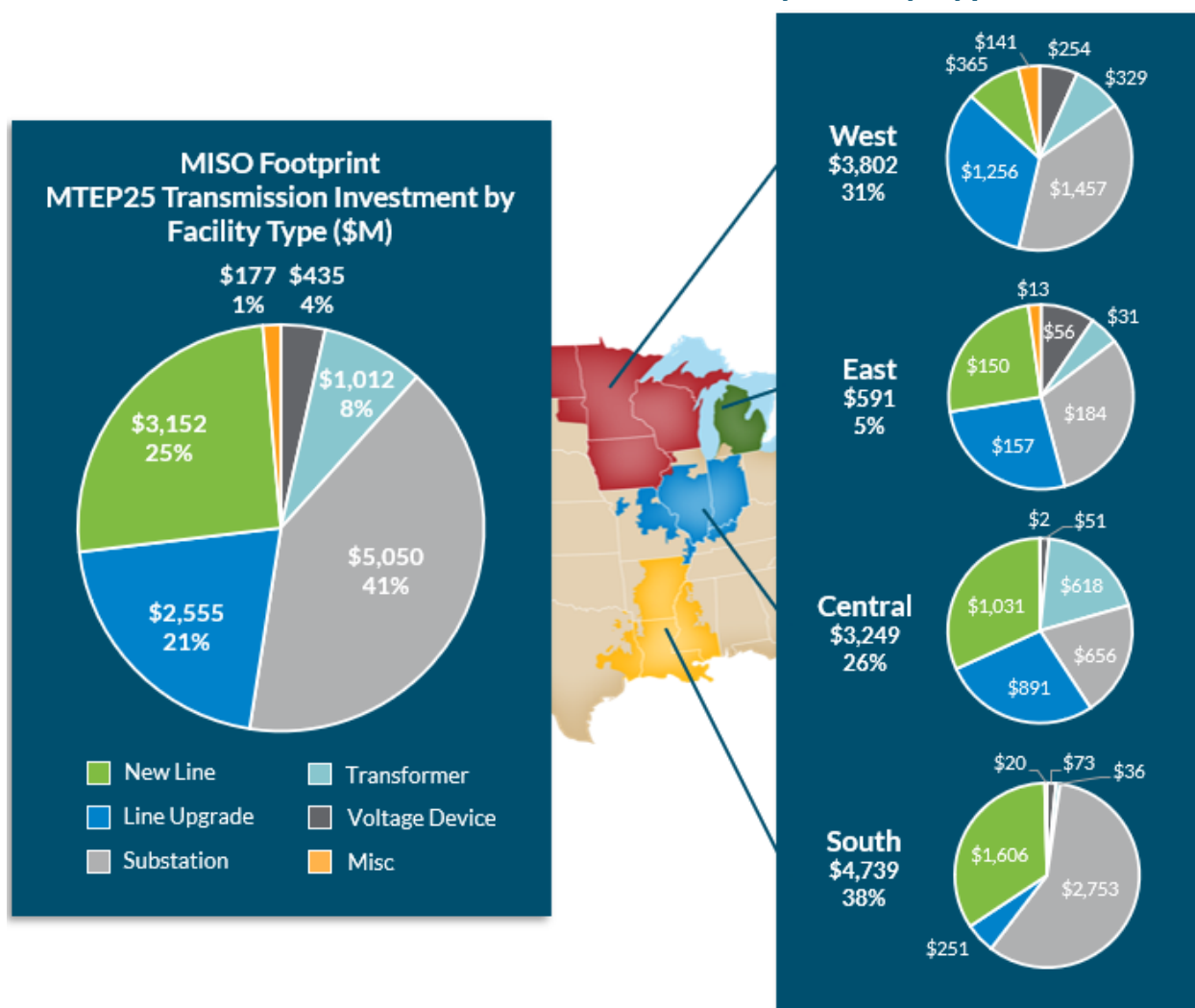


Figure 4.1-6: Facility type investment for new MTEP25 Appendix A projects by planning region (as of 8-28-25).

New Appendix A projects can be broken down at a facility level and are spread over 14 states (Figure 4.1-7). These geographic trends vary greatly year-to-year depending on local needs due to varying asset renewal programs or as existing transmission capacity is consumed and new build becomes necessary. This year shows the investment at a facility level spanning between all subregions, with notably the largest investment in Louisiana.

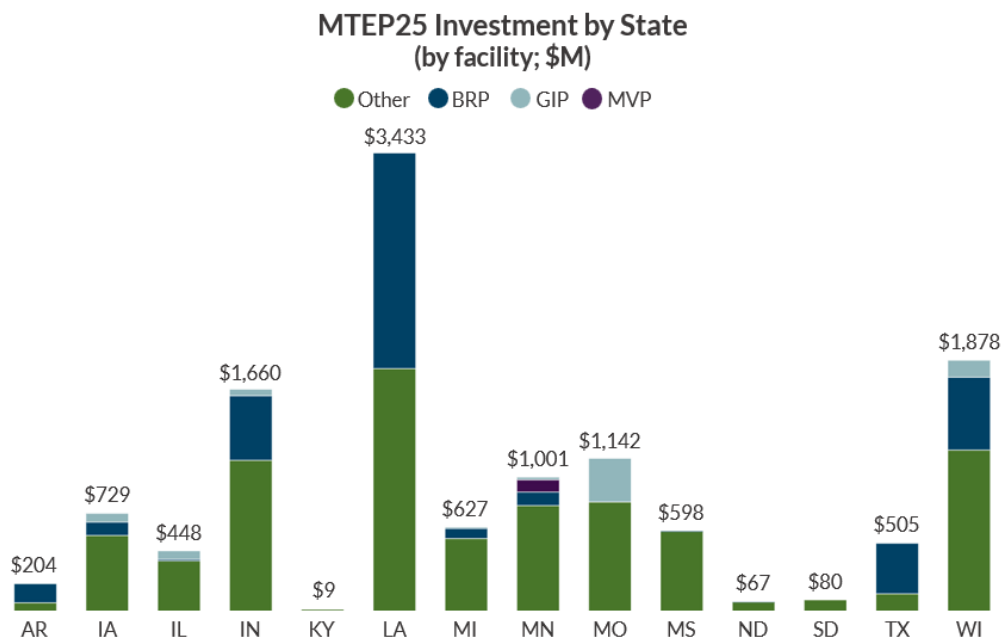


Figure 4.1-7: MTEP25 Appendix A investment categorized at a facility-level by state (as of 8-28-25).

MTEP25 New and Upgraded Line Miles

MTEP25 Appendix A projects total approximately 1,934 miles of new (Figure 4.1-8) or upgraded lines (Figure 4.1-9). Of the total, twenty-eight percent of new or upgraded line miles will go into service within the next three years, or 92% within five years. There are 893 line miles, or 46% of the total line miles, that are 230 kV or below. There are 1,041 line miles (54%) projected at 345 kV or above.

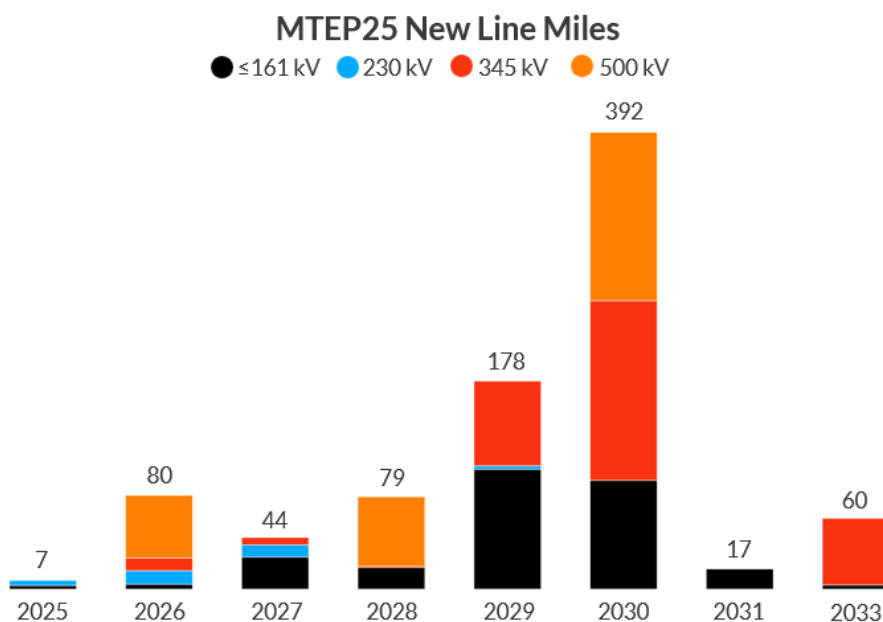


Figure 4.1-8: New and upgraded line miles in MTEP25 Appendix A projects (as of 8-28-25).

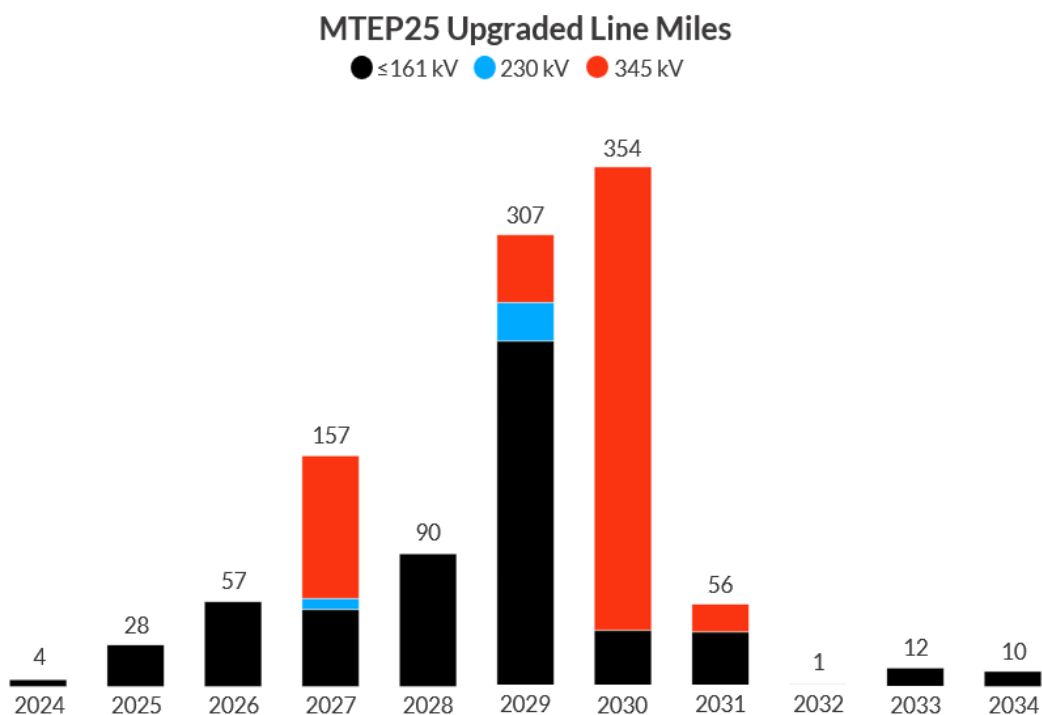


Figure 4.1-9: New and upgraded line miles in MTEP25 Appendix A projects (as of 8-28-25).

MTEP25 project recommendations

The MTEP25 portfolio consists of 435 projects totaling nearly \$12.4 billion in investment from 34 Transmission Owners across MISO's footprint. Table 4.1-2 provides a quick summary of each Transmission Owner's number of projects and estimated investment totals being recommended.



Transmission Owners	Baseline Reliability Projects		Generator Interconnection Projects		Other		Multi-Value Projects		Grand Total	
	#	\$M	#	\$M	#	\$M	#	\$M	#	\$M
Ameren Illinois			7	56	16	289			23	345
Ameren Missouri			6	328	17	208			23	536
Ameren Transmission Company of Illinois					2	604			2	604
American Transmission Company	5	546	20	139	49	1,219			74	1,904
Arkansas Electric Cooperative Corporation	1	37			1	18			2	55
Big Rivers Electric Corporation					2	9			2	9
Central Minnesota Municipal Power Agency					4	21			4	21
Dairyland Power Cooperative			1	1	2	4			3	6
Duke Energy Indiana	5	272	2	14	12	130			19	415
Entergy Arkansas	6	106	1	2	3	40			10	149
Entergy Louisiana	7	1,618			10	1,815			17	3,433
Entergy Mississippi	1	4			4	570			5	575
Entergy Texas, Inc	7	380			3	125			10	505
Great River Energy	1	2	1	5	25	310			27	317
Hoosier Energy					7	119			7	119
Indianapolis Power & Light Company	13	149			2	11			15	160
ITC	3	4			8	131			11	135
ITC Midwest	1	16	8	19	10	511			19	545
Michigan Electric Transmission Co.	3	72			12	338			15	410
MidAmerican Energy Co.	4	95	7	54	12	51			23	201
Minnesota Municipal Power Agency					1	1			1	1
Minnesota Power Inc.	3	83			5	18			8	100
Missouri River Energy Services					4	23			4	23
Montana-Dakota Utilities Co.					1	32			1	32
Northern Indiana Public Service Company	1	3	4	36	4	12			9	51
Northern States Power Company	3	12			36	523	1	92	40	627
Otter Tail Power Company			2	9	9	5			11	14
Prairie Power, Inc.					10	75			10	75
South Mississippi Electric Power Association					6	23			6	23
Southern Illinois Power Cooperative			1	9					1	9
Southern Indiana Gas & Electric Co.					7	76			7	76
Southern Minnesota Municipal Power Agency	2	7			1	4			3	11
Wabash Valley Power Association, Inc	2	60			17	789			19	849
Wolverine Power Supply Cooperative, Inc					4	47			4	47
	68	3,466	60	673	306	8,150	1	92	435	12,381

Table 4.1-2: MTEP25 Appendix A new project investment and totals by Transmission Owners (as of 8-28-2025).



MISO also considered alternatives for three projects, two in the East region and one in the Central region. As a result of the alternative analysis, MISO selected one of the original projects, one alternative and its original project were moved to Appendix B for further study, and one alternative and its original project were removed from MTEP25. Below are the projects that were submitted and evaluated as alternatives. More details are shared about these alternatives in the following sub-sections.

	Project Name	Planning Region	MISO Recommendation
1	Alternative to 50309 Rebuild Eureka 138 kV Station	East	Neither project was selected, and 50309 was moved to Appendix B in order for the members to further study the options.
2	Alternative to 20015 Rebuild Bingham – Cornell 138 kV	East	MISO selected the alternative, to withdraw project 20015. The need for rebuilding the line was negated by the inclusion of LRTP Tranche 1 projects to the model.
3	Missouri Multi-Entity New Transmission (MoMENT) (Alternate)	Central	Primary project was chosen by Ameren and the alternate was moved to Appendix B.

In accordance with Attachment FF of the tariff, in the event a Transmission Owner determines that system conditions warrant the urgent development of system enhancements, an expedited review of the impacts of the project can be requested. MISO shall use a streamlined approval process for reviewing and approving projects proposed by the Transmission Owner(s) and decisions will be provided to the Transmission Owner within 30 Days of the project’s submittal to MISO unless a longer review period is mutually agreed upon. Out of the 435 local MTEP25 projects submitted in this cycle, MISO Planning Engineers received and evaluated 49 Expedited Project Review (EPR) requests. Of the total EPR requests, nearly 50% are located in the Central planning region. New load interconnections account for over 67% of the EPR requests submitted, and nearly 40% located in the Central planning region. The following local MTEP25 projects were submitted through the Expedited Project Review (EPR) process:

	Project ID	Project Name	Planning Region	Current Cost (\$M)
1	22788	Rebuild Prest-Tibbs 138 kV line (1558)	Central	\$23
2	24919	Mill Road – Granville Project	West	\$424
3	50157	Big Cedar Load Expansion	West	\$381
4	50165	Racine County, DIC, Stratus Substation	West	\$69
5	50166	Racine County, DIC, Mount Pleasant Substation Expansion	West	\$117



	Project ID	Project Name	Planning Region	Current Cost (\$M)
6	50167	Racine County, DIC, Jupiter Substation	West	\$295
7	50168	Racine County Western Feed Transmission Line Project	West	\$124
8	50176	Audubon 230 kV Load Addition and Line upgrades	South	\$6
9	50190	New Peru-Princeton 138 kV line	Central	\$90
10	50196	Admiral 138 kV New Substation and Transmission Line	South	\$54
11	50198	New Wieland Metals 138 kV Load Addition	Central	\$11
12	50199	Rhodair 230 kV New Substation and Transmission Lines	South	\$85
13	50208	New LEAP Transmission Network	Central	\$222
14	50209	South China 138 kV New Substation	South	\$6
15	50212	Avery - New DTE Interconnection	East	\$16
16	50223	Whitewater – Sugar Creek 138 kV (WHIG53), Flow Control Device	West	\$3
17	50225	North Lake Geneva – Elkhorn 138 kV (X-55), Rebuild	West	\$24
18	50396	New BREC Bon Harbor-OMU Sub 'M' 69 kV Interconnection	Central	\$8
19	50497	MidAmerican Upgrades for MTEP 50157 Big Cedar Load Expansion	West	\$17
20	50528	Benoit 230 kV Station	South	\$52
21	50531	New AECL Load Addition at Ameren Fredericktown 138 kV	Central	\$1
22	50539	Cargas 500 kV and Smalling 500-230 kV stations	South	\$1,210
23	50540	Sarepta to Mount Olive 500 kV Project	South	\$470
24	50541	El Dorado 500/345 kV Autotransformer Upgrade	South	\$36
25	50546	Bluepoint 230 kV New Substation and line Cut-ins	South	\$60
26	50551	New Stillwell to Elderberry 345 kV Line	Central	\$75
27	50581	Fort Mountain 161 kV: Build New Substation	South	\$6
28	50594	Helena Harbor Load Addition	South	\$18
29	50599	New Merom 345 kV Substation Load Addition	Central	\$13
30	50603	OTP Big Stone South Load Addition	West	\$0
31	50608	Riparian 115 kV Station	South	\$28



	Project ID	Project Name	Planning Region	Current Cost (\$M)
32	50614	New Marble Hill 345 kV Station and Load	Central	\$21
33	50615	New Central 138 kV Substation Load Addition	Central	\$1
34	50616	New Rootbeer 345 kV Substation Load Addition	Central	\$2
35	50617	New 345 kV Lumberjack substation for Load Connection	Central	\$39
36	50628	Upgrade LEAP Transmission Network Phase 2	Central	\$345
37	50636	New Diamond Core Load Addition (RECC Territory) at Mogul 345 kV substation	Central	\$0
38	50671	RiverPlex 500-230 kV Station	South	\$284
39	50675	Cove Ridge 138 kV Station	South	\$24
40	50691	LEAP Phase 2 EPR Mitigations	Central	\$45
41	50696	New Huster-McClay 138 kV line tap for Hayford load	Central	\$1
42	50698	New Scotland 345/69 kV Substation	Central	\$38
43	50718	Rebuild Cayuga to Nucor 345 kV line	Central	\$96
44	50719	Rebuild Nucor to Wolf Creek 345 kV line	Central	\$49
45	50722	New Pond Creek 345:138 kV Substation	Central	\$40
46	50723	Uprate IPL Petersburg to Cato 138 kV Equipment	Central	\$4
47	50725	Rebuild Kokomo HP to Tipton West to Cammack Rd Jct 230 kV	Central	\$66
48	50727	Replace Thompson 345/138/13.75 MVA Autotransformer at Thompson Substation	Central	\$15
49	50728	Add 3rd 345/138 kV Bank at Edwards Sub	Central	\$15

Allocation of Costs

MTEP25 projects includes a total of 15 new cost-share eligible Generator Interconnection Projects (GIPs) for Appendix A. GIP costs are primarily paid for by the interconnecting customer (generator), however, a portion of the costs for certain network upgrades are eligible for regional cost allocation under Attachment FF of the MISO Tariff. Detailed allocations by pricing zone are provided in Appendix A1.



Indicative rates related to past MTEP cost-shared projects are calculated on an annual basis. Please refer to the reports [\(indicative forecasts of annual charges\)](#) posted on the MISO public website¹.

MTEP Appendix B

MTEP Appendix B contains all projects that have been validated by MISO as the preferred solution to address an identified system need based on current information and forecasts, but where it is prudent to defer the final recommendation of a solution to a subsequent MTEP cycle.

This generally occurs when the preferred project does not yet need a commitment based on anticipated lead-time and there is still some uncertainty as to the prudence of selecting this project over an alternative project given potential changes in projected future conditions. MTEP Appendix B is limited to Baseline Reliability Projects and Other Projects and will be reviewed by MISO in subsequent cycles.

¹ Cost Allocation updates web address: <https://www.misoenergy.org/planning/planning/schedule-26-and-26a-indicative-reports/>



4.2 Reliability Assessment and Compliance

MISO, in collaboration with its transmission-owning members and stakeholders, performs annual reliability assessments to identify transmission infrastructure upgrades needed to ensure the continued system reliability in compliance with applicable local and regional reliability standards. The reliability assessment process for local MTEP25 projects (shown in Figure 4.2-1) began with a roll-up of issues and potential solutions identified from the NERC assessment of the prior MTEP cycle and from the local planning processes of Transmission Owners (TOs). Following this step, MISO conducted an independent reliability assessment to evaluate and integrate the TO local planning information into the development of the overall MTEP.

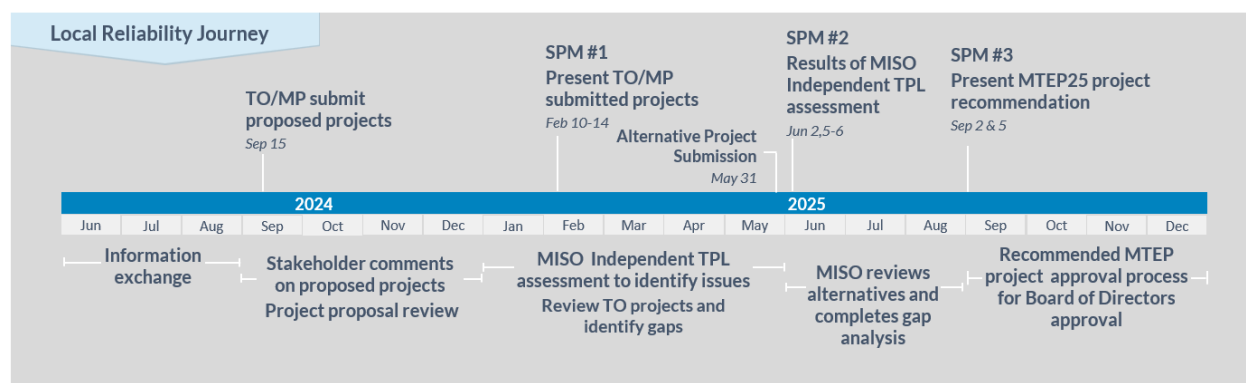


Figure 4.2-1: Local MTEP25 reliability assessment process.

MISO closely coordinates the annual reliability assessment with other planning efforts to ensure the local transmission expansion plan is met in the most efficient and cost-effective manner. A variety of factors are considered as part of MISO's transmission expansion plan development, including but not limited to, large power swings, urgency of needs, cost effectiveness of solutions, system performance of solution alternatives to address identified transmission issues, and other considerations such as lead time to develop a project, right-of-way (ROW) or substation impacts, expandability, operational flexibility, etc.

In conjunction with the MTEP planning process, an inclusive, open transparent stakeholder process is utilized to facilitate discussions and allow stakeholders to provide early and meaningful inputs into the development of transmission solutions in each planning cycle. The results of MISO's independent reliability assessments, along with proposed solution alternatives, are presented to stakeholders through a series of public Subregional Planning Meetings (SPM), and additional Technical Study Task Force (TSTF) meetings as needed, for each of the four MISO planning subregions: Central, East, South, and West.

MISO strategically set up our local planning processes to assume FERC Order 890 transparency requirements for Transmission Owner submissions resulting in different study approaches based on the types of projects submitted by Transmission Owners.

- **Verify need:** Confirmation of system need identified in project submission including to meet compliance with applicable National Electric Reliability Organization (NERC) reliability standards and reliability standards adopted by Regional Reliability Organizations, and applicable within the



Transmission Provider Region. MISO must verify the need for alternatives to adequately examine their effectiveness.

- **No harm:** Ensure a submitted project does not create a system issue. Includes projects that create model changes like contingency definitions, line ratings, or line impedances.
- **Post only:** Provided for FERC Order 890 transparency provisions. May include controls equipment to communicate remotely with the facility. This information is not able to be represented with model changes.

Alternatives for projects may be completed prior to submission to MISO by the Transmission Owners, proposed by MISO, or proposed by stakeholders. Alternative criteria considers cost comparisons, feasibility to construct and how reliability needs are resolved. Alternatives do not always result in one project replacing another, instead they tend to be additive to the original project, even when submitted with the thought that they would directly compete. MISO considers alternatives in multiple forms, including like-for-like replacement, regional reliability projects, the combination of multiple local solutions, and other options identified through either MISO analysis or submitted by stakeholders.

After MISO completes its independent review of all proposed projects and associated alternatives and addresses stakeholder feedback received through SPM discussions, MISO staff formally recommends a set of projects to the MISO Board of Directors for review and approval. These projects make up Appendix A of the MTEP report and represent the preferred solutions to the identified transmission needs of the MISO reliability assessments. Proposed transmission upgrades with sufficient lead times are included in Appendix B for further review in future planning cycles.

The complete results of local MTEP25 reliability assessments are detailed in Appendices D3-D10 of the MTEP25 report, which are available on the [MISO ShareFile site](#) and subject to Critical Energy Infrastructure Information (CEII) and non-disclosure agreements. These results serve as compliance evidence for a variety of NERC planning standards listed on the [MISO public website](#).

As appropriate, an executive summary of results for the appendices will be available on the MISO website.

Appendix	Title	Insights
D3	Steady State CEII	MISO ran N-1, N-1-1, spare equipment, planned outages, adjacent, and extreme event contingency analysis to identify any voltage and thermal violations in the MISO area. For local MTEP25 projects, over 300,000 issues were identified, and all valid results contain a corrective action plan to mitigate the violation.
D4	Voltage Stability CEII	MISO studied ten interfaces for voltage stability. These studies cover all four regions in MISO footprint for potential voltage stability issues in various planning horizons. The most limiting contingencies and transfer levels are identified for each interface. Interconnection Reliability Operating Limit (IROL) tests are performed at instability transfer levels and no new IROL is identified from this year's studies.
D5	Transient Stability CEII	MISO analyzed over 5,000 dynamic disturbances to identify any violations on the system and posted issues for stakeholder comments after MISO reviews the results.
D6	Generator Deliverability CEII	MISO conducted the Annual MTEP Deliverability Analysis to ensure the ongoing deliverability of existing Network Resources (NRs).



Appendix	Title	Insights
		Affected stakeholders have reviewed the preliminary results for MTEP25.
D7	Contingency Coverage CEII	MISO received 274,309 steady state contingencies from 41 Transmission Owners to be used in MTEP25 contingency analysis. There were an additional 15,251 contingencies added by MISO to ensure full coverage.
D8	Nuclear Plant Interface Coordination CEII	MISO incorporated Nuclear Plant Interface Requirements (NPIRs) into the MTEP25 analyses, adhering to Nuclear Plant Operating Agreements. MISO monitored steady state analysis, transient stability, and extreme events for nuclear plants in the MISO footprint and addressed any constraints by implementing mitigations necessary to adhere to NPIRs.
D9	Planning Horizon Transfer Capability CEII	MISO performed a comprehensive 5-year and 10-year Transfer Capability analysis to evaluate the robustness of the MISO transmission system, taking into account both LRTP 1 (5-year) and LRTP 2.1 (10-year) impacts.
D10	Short Circuit Analysis CEII	For local MTEP25, TO transmission planners have performed a short-circuit analysis to determine whether their circuit breakers have the expected interrupting capability for faults. If the short-circuit current interrupting duty on a circuit breaker exceeds the equipment rating, the TO transmission planner has provided MISO a corrective action plan to mitigate the violation.

Transfer Capability Analysis is performed annually in accordance with MISO's Transfer Capability Methodology in Appendix N of BPM-020 – Transmission Planning, which requires this assessment of the transmission system to identify weaknesses and limiting facilities that could impact the Bulk Electric System's (BES) ability to reliably transfer energy in the Near-Term Transmission Planning Horizon. The Appendix D9 report summarizes the results of the assessment performed by MISO planning staff.

There were eleven (11) transfer scenarios analyzed for this MTEP planning cycle (Figure 4.2-2). The First Contingency Incremental Transfer Capability (FCITC) for each linear transfer was calculated, along with the Total Transfer Capability (TTC) on the transfer paths. The typical transfer test level is the sum of available generation MW in the source area, which is considered a high transfer level. The entire NERC book of flowgates were analyzed for all transfer scenarios.

For some of the transfers, the transfer capability increased as compared to previous MTEP cycles indicating an improvement in MISO Bulk Electric System performance. However, the transfer capability decreased for some of the transfers because of reasons such as localized constraints and addition of large loads in MTEP planning models. Transfer capability was also compared between the 5-year out and 10-year out model, which represents the addition of LRTP Tranche-2.1 facilities. Again, some of the transfers had decreased transfer capability in the 10-year out model because of localized constraints. Mitigating these localized constraints enables substantial increase in transfer capability in the 10-year out model.

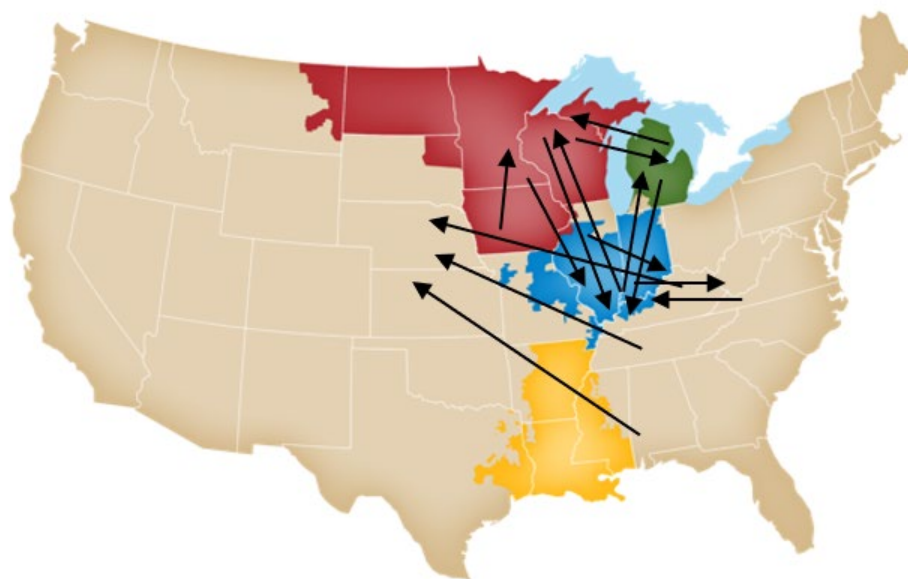


Figure 4.2.-2: MTEP25 transfer Scenarios studied.



4.3 Project Justifications – Central Region

Central Region Overview

The MISO Central planning region spans four states (Missouri, Illinois, Indiana, and Kentucky) and consists of the following Transmission-Owning members:

American Electric Power Service Corporation (AEP)	Henderson Municipal Power & Light (HMPL)
Ameren Illinois (AMIL)	Hoosier Energy REC Inc. (HE)
Ameren Missouri (AMMO)	Indianapolis Power & Light (IPL)
Ameren Transmission Company of Illinois (ATXI)	Northern Indiana Public Service Co. (NIPSCO)
Big Rivers Electric Corp. (BREC)	Pioneer Transmission (PTx)
Citizen's Electric Corporation (CEC)	Prairie Power Inc. (PPI)
City of Columbia, Mo. (CWLD)	Republic Transmission (RTx)
City of Springfield, Ill. (CWLP)	Southern Indiana Gas & Electric (SIGE)
Duke Energy Corp. (DEI)	Southern Illinois Power Cooperative (SIPC)
GridLiance Heartland LLC (GLH)	Wabash Valley Power Association Inc. (WVPA)

The Bulk Power System (BPS) within these states consists of an extensive 765 kV, 345 kV, 230 kV, 161 kV, and 138 kV networked transmission system. The 345 kV network spans Missouri, Illinois, and Indiana, both north to south and east to west. The 230 kV network spans through Indiana, both north to south and east to west. The 161 kV network spans north to south and east to west in Missouri, Illinois, and Kentucky. The 138 kV network spans both north and south, and east to west in Illinois, Indiana, and Kentucky and east in Missouri. All of Ameren, BREC, CEC, CWLD, CWLP, GLH, HMPL, PPI, and SIPC belong entirely in the SERC Region for reliability administration. All of DEI, HE, IPL, NIPSCO, PTx, RTx, SIGE, and WVPA belong entirely in the ReliabilityFirst Region.

Major load centers in the MISO Central planning region are St. Louis, MO; Jefferson City, MO; Peoria, IL; Springfield, IL; Evansville, IN; Gary, IN; Merom, IN; and Indianapolis, IN (shown in Figure 4.3-1).

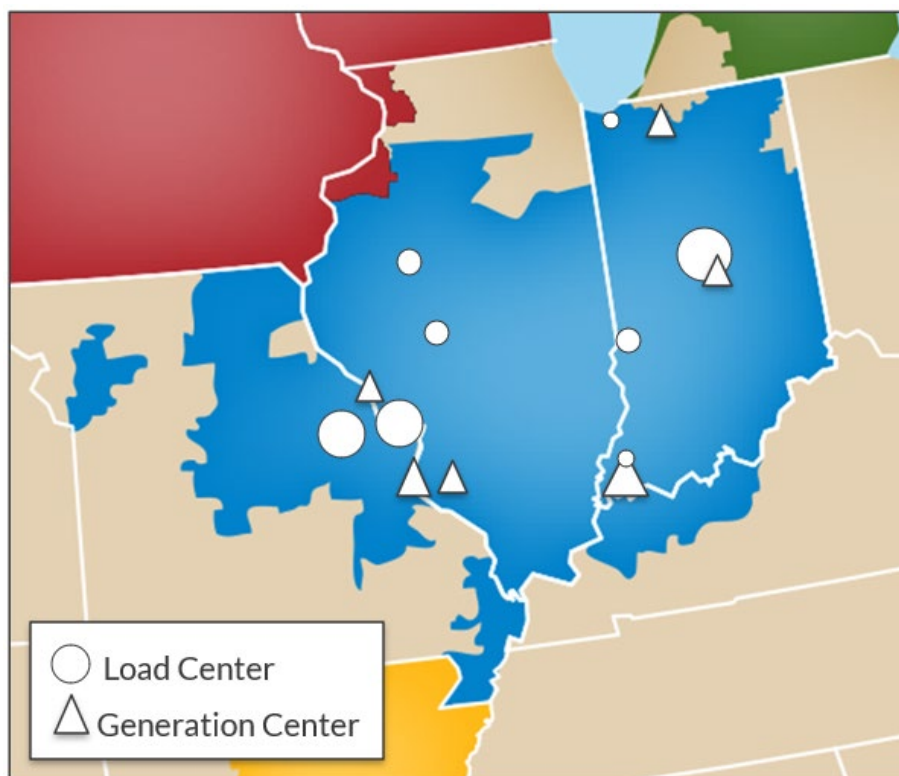
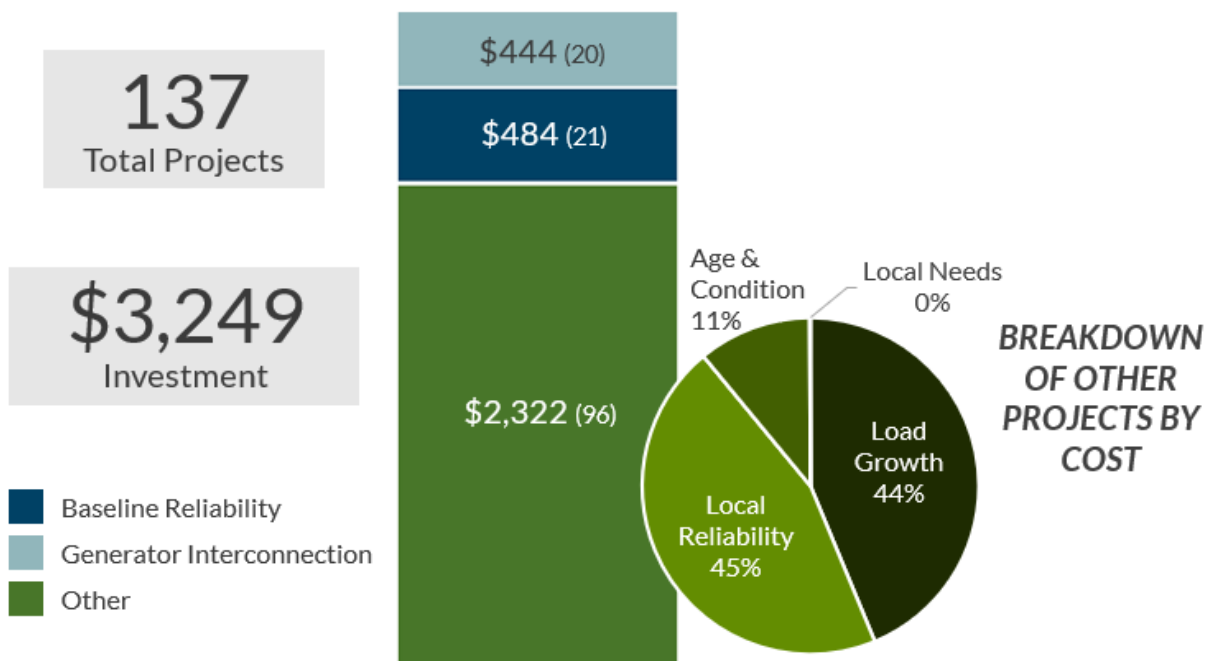


Figure 4.3-1: Generation and load centers in the Central planning region.



Central Planning Region Local MTEP25 Summary

(Data as of August 28, 2025; \$M, # project count)



CENTRAL REGION HIGHLIGHTS

Transmission Miles

576 total line miles
58% new miles, 42% upgraded miles
Top states: Indiana, Missouri, Illinois

Spot Load Additions (4.3 GW)

Top states: Indiana, Missouri, Illinois

Expedited Project Reviews (EPRs)

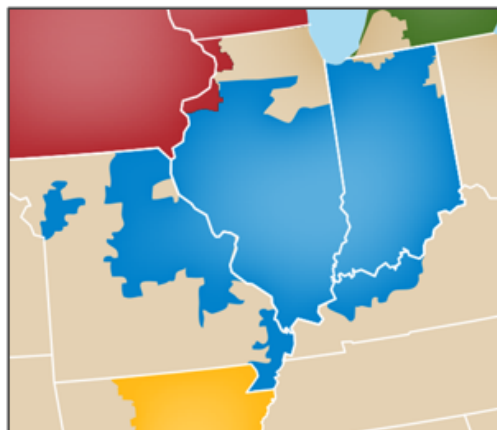
24 approved
\$1.2 billion investment
Top states: Indiana, Missouri, Illinois

Central Region Total Investment

Top states: Indiana, Missouri, Illinois

Other Projects:

Majority of Load Growth in Indiana
Majority of Local Reliability in Missouri





The ten largest project investments in the MISO Central region represent \$1.8 billion (56%) of the \$3.2 billion total recommended projects for the Central region, or 15% of the \$12.4 billion total recommended in the MISO footprint. The locations of these projects are shown in Figure 4.3-2, and the investment is spread across the Central planning region. Projects that are blanket expenditures (relays, physical security, etc.) are excluded from this list.

Central Region Top 10 Local MTEP25 Projects

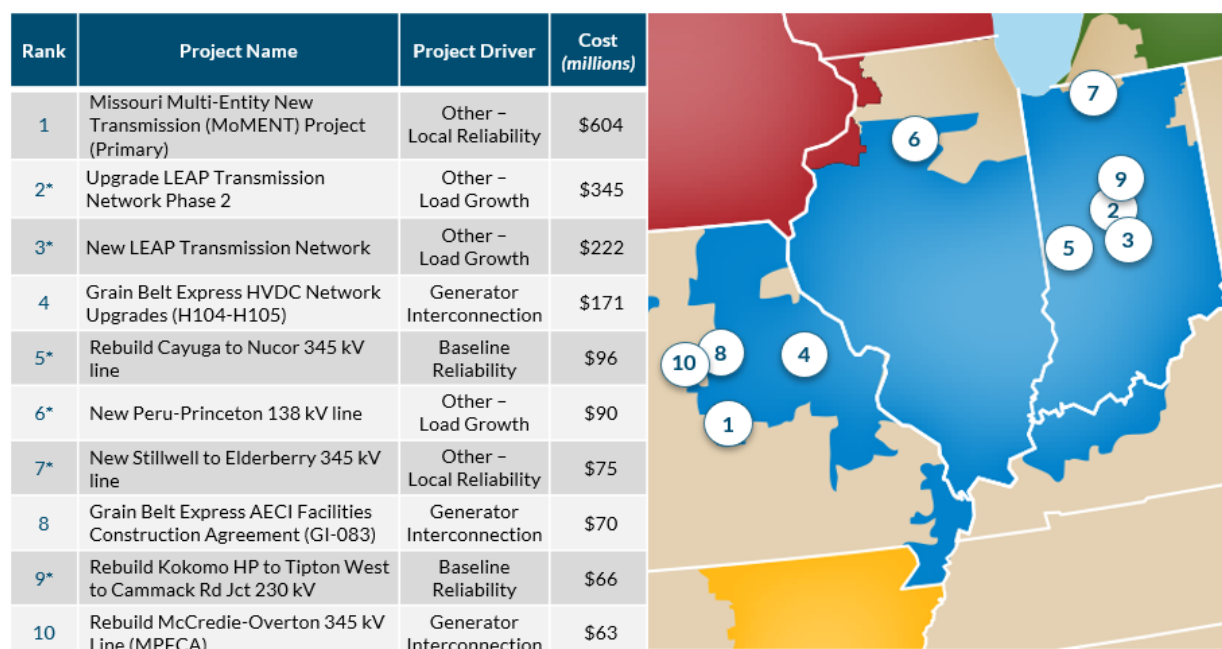


Figure 4.3-2: Central region top ten projects by cost; * represents project studied through Expedited Project Review (EPR) process (as of 8-28-2025).

4.3.1 American Electric Power Service Corporation (AEP)

American Electric Power Service Corporation and MISO are not recommending any new projects for MTEP25.



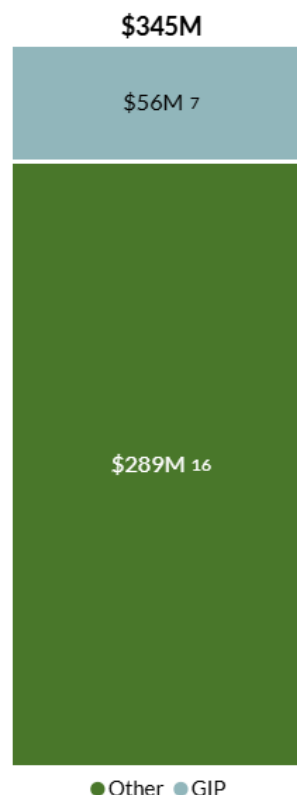
4.3.2 Ameren Illinois (AMIL)

AMEREN ILLINOIS

MTEP25 Summary

23
Total Projects

\$345M
Investment



Other Projects

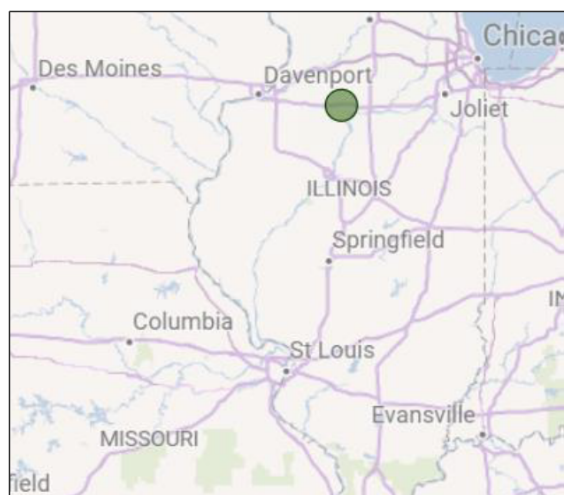
Project ID	Project Name	Other Breakdown	ISD	Estimated Cost (\$M)
9740	Reconductor Grand Tower-Campbell Hill 138 kV line	Age and Condition	12/1/2029	\$34.9
*22788	Rebuild Prest-Tibbs 138 kV line (1558)	Local Reliability	12/1/2025	\$23.0
22907	Upgrade Tuscola West 138 kV substation	Age and Condition	12/1/2026	\$5.8
22908	Rebuild Joppa - Marion South 161 kV line	Age and Condition	12/1/2030	\$46.5
25269	Replace West Frankfort East 345/138 kV transformer 1	Age and Condition	12/1/2026	\$10.6
25328	Upgrade Charleston NE 138 kV line	Age and Condition	6/1/2026	\$4.0
50140	Upgrade Fargo 138 kV Line Position for Lucky	Local Needs	12/1/2029	\$2.0
50175	Upgrade Taylorville South 138 kV Substation	Local Reliability	12/1/2026	\$5.2
50185	Replace Marion South 161/138 kV transformer	Age and Condition	12/1/2026	\$3.6



Project ID	Project Name	Other Breakdown	ISD	Estimated Cost (\$M)
*50190	New Peru-Princeton 138 kV line	Load Growth	6/1/2029	\$90.0
*50198	New Wieland Metals 138 kV Load Addition	Load Growth	12/1/2026	\$10.7
50230	New Harco South-Carrier Mills 161 kV line	Local Reliability	12/31/2029	\$30.0
50257	Reconfigure Steeleville 138 kV Substation to Ring Bus	Age and Condition	12/1/2026	\$6.0
50282	New Radbourn 345 kV and Leghorn 345 kV Shunt Reactors	Load Growth	12/1/2026	\$4.8
50288	Replace Marblehead North 161/138 kV transformer	Age and Condition	12/1/2027	\$1.5
50299	New Wakefield 138 kV switching station	Load Growth	12/1/2027	\$10.7

* Project studied through Expedited Project Review (EPR) process.

50190 – New Peru-Princeton 138 kV line



Submitting TO	AMEREN ILLINOIS
Project #	50190
Project Name	New Peru-Princeton 138 kV line
Project Type	Other – Load Growth
Project Description	Rebuild the existing Princeton substation as a 4-position 138 kV substation in a ring bus configuration with two additional positions available for future expansion. Construct a new 4-position 138 kV substation in a ring bus configuration with two additional positions available for future expansion. Construct a new 23-mile 138 kV Transmission line from Ameren's Princeton substation to the new substation near the City of Peru.
System Need	
Current Cost	\$90M
Expected ISD	6/1/2029
Target Appendix	A

Figure 4.3.2-1: P50190 Geographic transmission map of project area and MTEP Portal project details.

Project submitted through the Expedited Project Review (EPR) process and a reliability analysis showed that no adverse system impact would be caused by this project.

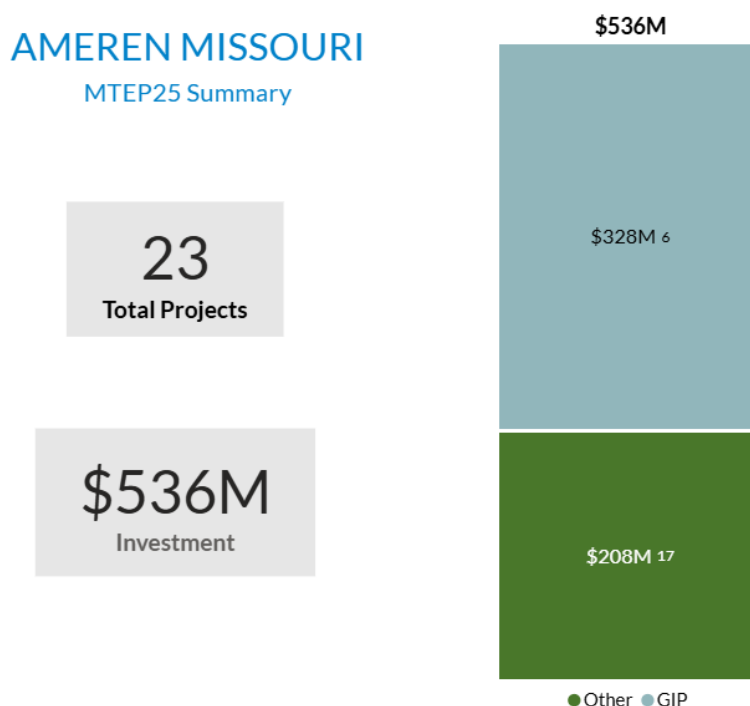
Generator Interconnection Projects

Project ID	Project Name	ISD	Estimated Cost (\$M)
25018	New Moonshine Solar Bootleg 138 kV switching station (J1382)	12/1/2025	\$8.0
50077	New Aster 138 kV interconnection (J1777)	6/1/2026	\$0.8
50084	New Ramsey East 138 kV Connection (J1714)	12/1/2026	\$0.8



Project ID	Project Name	ISD	Estimated Cost (\$M)
50118	Upgrade Powerton-Tazewell 345 kV line (AE1-163)	12/1/2025	\$1.5
50119	New Moro-Cottage Hills 138 kV Line (C1908 MPFCA)	6/30/2028	\$38.6
50189	Rebuild Latham-Docket-1409 138 kV line (C1903 MPFCA)	12/1/2027	\$4.0
50504	Upgrade Dupo Ferry 138 kV breakers	12/1/2026	\$2.5

4.3.3 Ameren Missouri (AMMO)



Other Projects

Project ID	Project Name	Other Breakdown	ISD	Estimated Cost (\$M)
22874	Upgrade Ashley 161 kV substation	Age and Condition	12/1/2027	\$4.1
22881	Upgrade Belleau 138 kV substation	Local Reliability	6/1/2027	\$3.0
23046	Upgrade Montgomery 345/161 kV Substation	Local Reliability	6/1/2026	\$17.0
25040	Replace Tyson 345/138 kV transformer 3	Age and Condition	12/1/2027	\$8.5
25496	New Blanchette 138 kV Ring Bus	Local Reliability	6/1/2027	\$7.0



Project ID	Project Name	Other Breakdown	ISD	Estimated Cost (\$M)
25497	Reconfigure Overton 161 kV Substation	Local Reliability	12/1/2027	\$46.0
50100	Rebuild Baumgartner 138 kV Substation	Age and Condition	6/1/2028	\$6.3
50226	New Vulcan 138/34 kV Substation	Load Growth	6/1/2027	\$12.0
50227	Upgrade California 161 kV Terminal	Local Reliability	6/1/2028	\$22.6
50256	New Tibbe 138/34.5 kV Substation	Load Growth	12/1/2029	\$33.0
50259	Rebuild Fletcher-Pilot Knob-2 161 kV line	Local Reliability	6/1/2026	\$1.4
50403	Relocate Dardenne 161/138 kV Substation	Age and Condition	12/1/2027	\$3.6
*50531	New AECI Load Addition at Ameren Fredericktown 138 kV	Load Growth	12/1/2026	\$1.2
*50615	New Central 138 kV Substation Load Addition	Load Growth	12/1/2026	\$1.0
*50616	New Rootbeer 345 kV Substation Load Addition	Load Growth	12/1/2026	\$2.0
*50617	New 345 kV Lumberjack substation for Load Connection	Load Growth	12/1/2027	\$38.5
*50696	New Huster-McClay 138 kV line tap for Hayford load	Load Growth	6/1/2027	\$0.5

* Project studied through Expedited Project Review (EPR) process.

Generator Interconnection Projects

Project ID	Project Name	ISD	Estimated Cost (\$M)
23530	New Spencer Creek generation interconnection MPFCA (J956/J1026)	5/3/2024	\$4.6
50154	Grain Belt Express AECI Facilities Construction Agreement (GI-083)	12/1/2027	\$70.5
50186	Grain Belt Express HVDC Network Upgrades (H104-H105)	12/1/2030	\$171.0
50220	Rebuild McCredie-Overton 345 kV Line (MPFCA)	6/1/2031	\$63.1
50221	Rebuild Overton-McBaine Tap 161 kV Line (MPFCA)	12/1/2030	\$9.6
50222	Rebuild Overton-Sedalia East 161 kV Line (MPFCA)	12/1/2030	\$9.7



4.3.4 Ameren Transmission Company of Illinois (ATXI)

AMEREN TRANSMISSION COMPANY OF ILLINOIS

MTEP25 Summary

2
Total Projects

\$604M
Investment



Other Projects

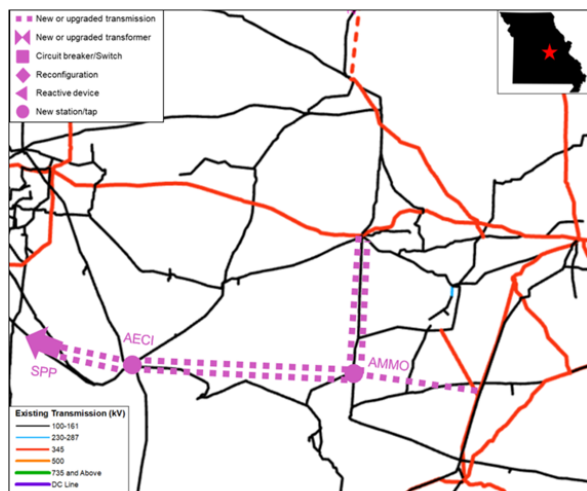
Project ID	Project Name	Other Breakdown	ISD	Estimated Cost (\$M)
**50631	Missouri Multi-Entity New Transmission (MoMENT) Project (Primary)	Local Reliability	12/1/2030	\$604.0
*50636	New Diamond Core Load Addition (RECC Territory) at Mogul 345 kV substation	Load Growth	12/1/2027	\$0.0

* Project studied through Expedited Project Review (EPR) process.

** Project included an alternative project (50632) which was moved to MTEP25/Appendix B by ATXI prior to the SPM3 meeting.



50631 - Missouri Multi-Entity New Transmission (MoMENT) Project (Primary)



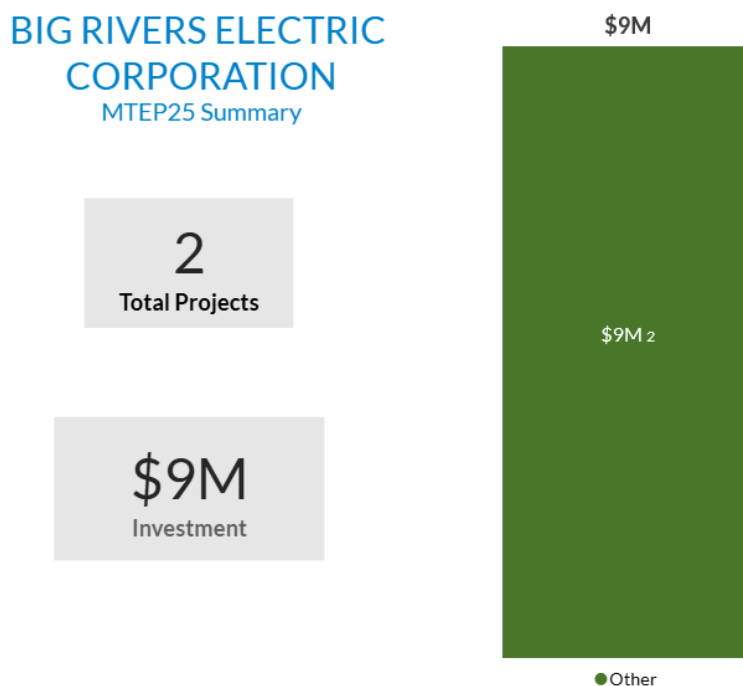
Submitting TO	AMEREN TRANSMISSION COMPANY OF ILLINOIS
Project #	50631
Project Name	Missouri Multi-Entity New Transmission (MoMENT) Project (Primary)
Project Type	Other
Project Description	New 40 mile 345 kV line from Loose Creek to Barnett. New 345/161 kV substation at Barnett. New 38 mile 345 and 161 kV double circuit line from Overton to Barnett. New 65 mile double circuit 345 kV line from Barnett to Clinton. New Clinton substation. New 50 mile double circuit 345 kV line from Clinton to LaCygne.
System Need	This program is the result of a joint effort between ATXI, AECI and Evergy to identify a portfolio of projects which would increase reliability to all customers across the Central and Western Missouri region. Benefits include Increased transfer capability between regions and increased reliability to multiple substations. Future benefits include potential interconnection points for generators and load customers.
Current Cost	\$604M
Expected ISD	12/1/2030
Target Appendix	A

Figure 4.3.4-1: P50631 Geographic transmission map of project area and MTEP Portal project details.

The joint project between ATXI, AECI, and Evergy (SPP) had two potential configurations under consideration. 50631 added double-circuit 345 kV lines between Barnett and Clinton substations and Clinton and LaCygne substations while the alternative, 50632, only added single circuits between the substations. ATXI, in consultation with the impacted entities, chose the Primary option prior to the third Subregional Planning Meeting (SPM3). The primary project was included in the MISO MTEP25 models and no new or worsened reliability issues were identified as a result. The cost represents the ATXI portion of the project.



4.3.5 Big Rivers Electric Corporation (BREC)



Other Projects

Project ID	Project Name	ISD	Estimated Cost (\$M)
*50396	New BREC Bon Harbor-OMU Sub 'M' 69 kV Interconnection	12/1/2026	\$7.5
50577	Henderson County Capacitor Bank	12/1/2027	\$1.5

* Project studied through Expedited Project Review (EPR) process.

4.3.6 Citizen's Electric Corporation (CEC)

Citizen's Electric Corporation and MISO are not recommending any new projects for MTEP25.

4.3.7 City of Columbia, MO (CWLD)

City of Columbia, MO, and MISO are not recommending any new projects for MTEP25.

4.3.8 City of Springfield, IL (CWLP)

City of Springfield, IL, and MISO are not recommending any new projects for MTEP25.



4.3.9 Duke Energy Corporation (DEI)

DUKE ENERGY INDIANA, LLC

MTEP25 Summary

19

Total Projects

\$415M

Investment

\$415M

\$14M²

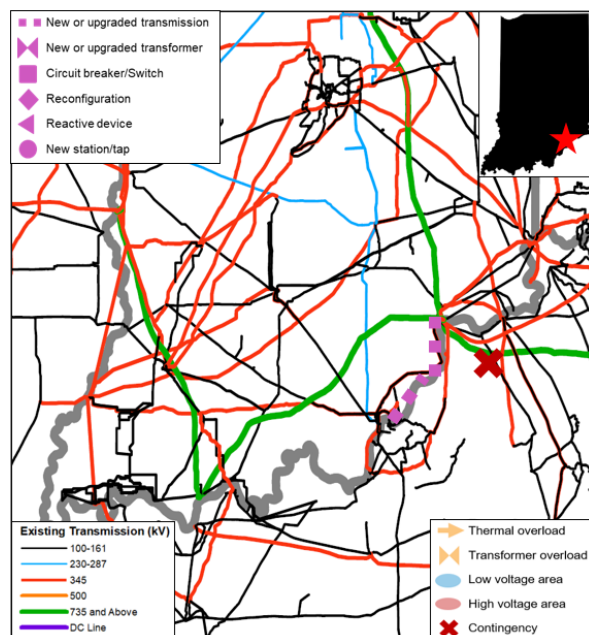
\$272M⁵

\$130M¹²

● Other ● BRP ● GIP

Baseline Reliability Projects

50201 – Rebuild Slugger to LGE Trimble 34530 Ckt. 345 kV Line



Submitting TO	DUKE ENERGY INDIANA, LLC
Project #	50201
Project Name	Rebuild Slugger to LGE Trimble 34530 Ckt. 345kV Line
Project Type	BRP
Project Description	34530 Rebuild - Slugger to LGE Trimble to (2)954ACSS@200C (DEI-owned portion only)
System Need	MTEP24 confirmed - thermal OL of 111% identified; 10 yr summer peak model only so 6/1/2030 is the earliest MTEP required IS date
Current Cost	\$43M
Expected ISD	6/1/2031
Target Appendix	A

Figure 4.3.9-1: P50201 Geographic transmission map of project area and MTEP Portal project details.



Project Justification: The [DEI] Slugger (old Popcorn) - [LGEE] Trimble County 345 kV tie line becomes overloaded to one hundred eleven (111%) percent in year 2034 for a NERC defined category P7 contingency event. Rebuilding Slugger to LGE Trimble 345/30 345 kV tie line project will increase the summer emergency rating of the line.

Cont. Type	Limiting Element	Pre-Project (post-cont.) Loading (%)	Post-Project (post-cont.) Loading (%)
P7	[DEI] Project Slugger (old Popcorn) - [LGEE] Trimble County 345 kV line	111	82

Table 4.3.9-1: P50201 Thermal loading drivers.

50279 – Replace Staunton 230/138 kV Xfmr Bk1 and 2

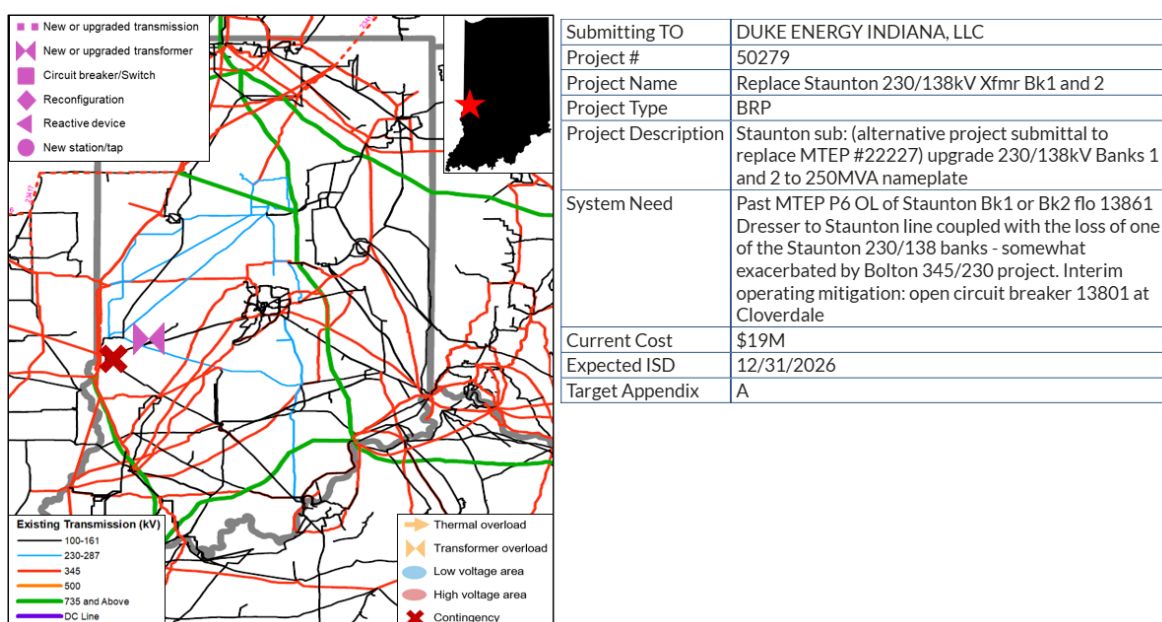


Figure 4.3.9-2: P50279 Geographic transmission map of project area and MTEP Portal project details.

Project Justification: The [DEI] Staunton 230/138 kV transformer is overloaded in year 2023 Summer peak to one hundred five (105%) percent for a NERC defined category P6 contingency event. Replacing Staunton 230/138kV transformer banks 1 and 2 will increase the summer emergency rating of the transformers.



Cont. Type	Limiting Element	Pre-Project (post-cont.) Loading (%)	Post-Project (post-cont.) Loading (%)
P6	[DEI] Staunton 230/130 kV transformer 1	105	77
P6	[DEI] Staunton 230/130 kV transformer 2	106	77

Table 4.3.9-2: P50279 Thermal loading drivers.

50718 – Rebuild Cayuga to Nucor 345 kV line

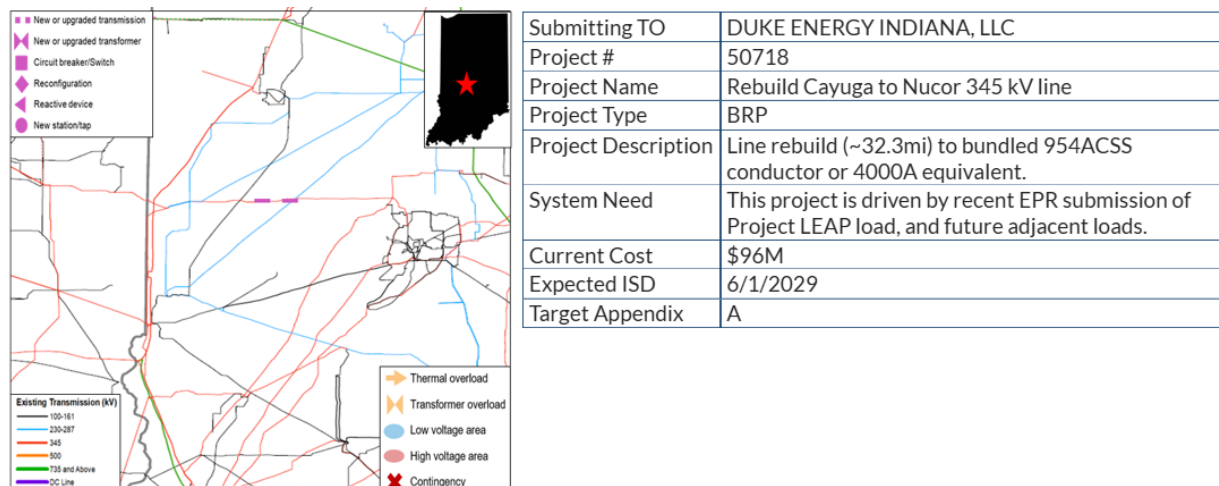


Figure 4.3.9-3: P50718 Geographic transmission map of project area and MTEP Portal project details.

Project submitted as a Corrective Action Plan for WVPA 50628 LEAP 2 Expedited Project Review (EPR).

50719 – Rebuild Nucor to Wolf Creek 345 kV line

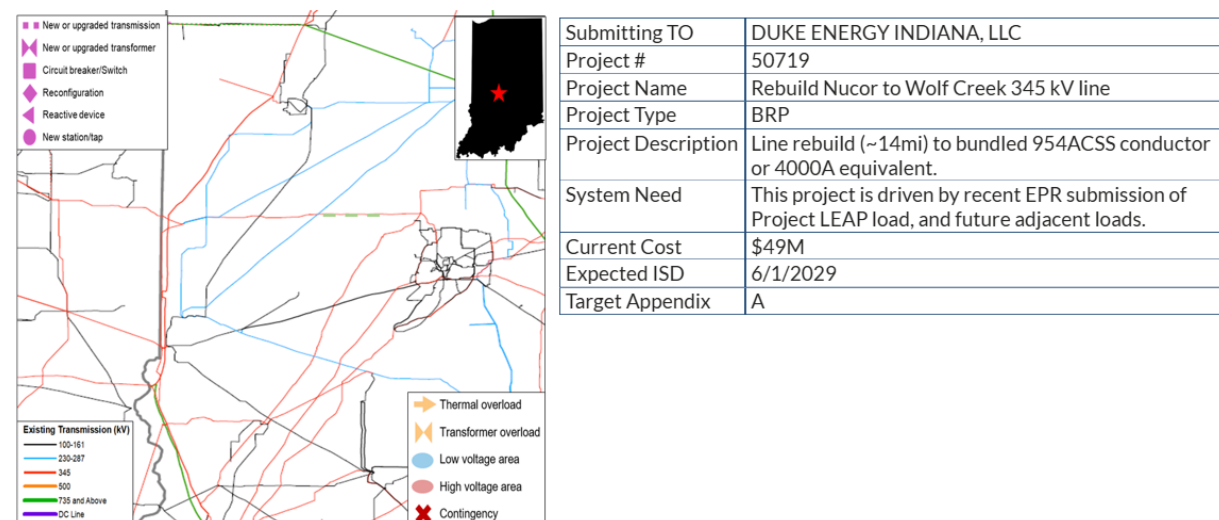


Figure 4.3.9-4: P50719 Geographic transmission map of project area and MTEP Portal project details.

Project submitted as a Corrective Action Plan for WVPA 50628 LEAP 2 Expedited Project Review (EPR).



50725 – Rebuild Kokomo HP to Tipton West to Cammack Rd Jct 230 kV

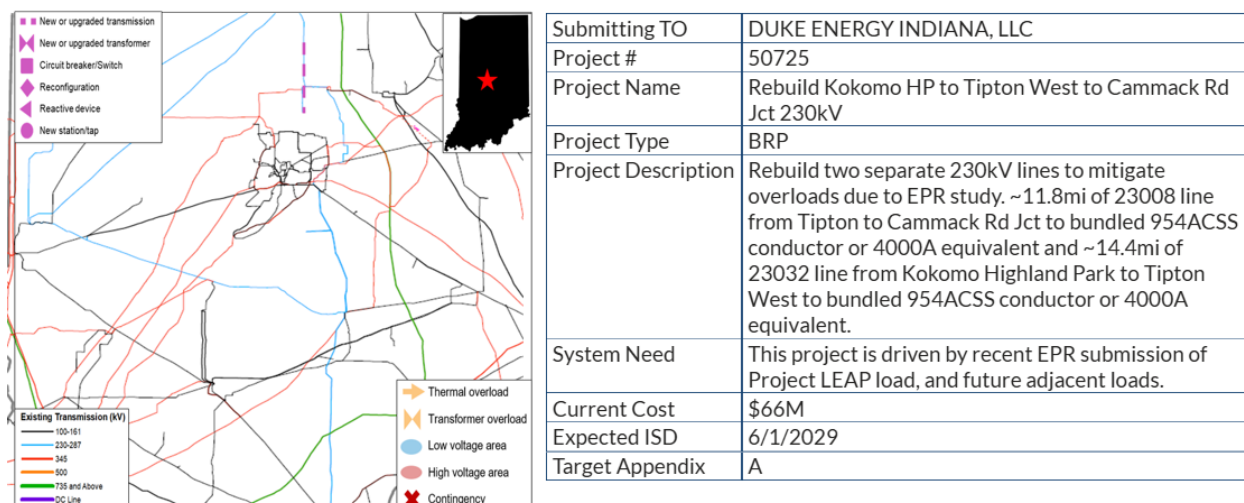


Figure 4.3.9-5: P50725 Geographic transmission map of project area and MTEP Portal project details.

Project submitted as a Corrective Action Plan for WVPA 50628 LEAP 2 Expedited Project Review (EPR).

Other Projects

Project ID	Project Name	Other Breakdown	ISD	Estimated Cost (\$M)
50280	New Neuron - Lafayette 27MW load	Load Growth	12/31/2028	\$25.0
50285	New HE Shadow Lake 138/12 kV Sub	Load Growth	6/1/2026	\$3.0
50289	New Wabash Industrial 69/12 kV Sub	Load Growth	10/16/2026	\$3.0
50341	Replace 34507 Gibson-Petersburg 345 kV Line	Age and Condition	5/21/2027	\$15.2
50342	Rebuild Greencastle Industrial Jct. to WVPA Vandalia 69 kV Line	Local Reliability	6/1/2026	\$2.0
50343	Terre Haute Water St. 138 kV Ring Bus	Local Reliability	12/10/2026	\$16.5
50345	New WVPA Richland 69 kV ring bus	Local Reliability	11/11/2026	\$11.7
50347	Replace Frankfort 230/69 Bk1	Age and Condition	7/31/2026	\$6.3
50349	Crane Naval Base load expansion	Load Growth	3/8/2027	\$29.0
50351	Rebuild Arcadia N to Arcadia 69 kV Line	Age and Condition	1/19/2027	\$5.5
50369	Rebuild Huntington Goblesville Jct to United Jct 69 kV Line	Age and Condition	12/11/2026	\$9.2
50376	Rebuild HE Bethany to Charlestown Jct 69 kV Line	Load Growth	6/1/2026	3.3



Generator Interconnection Projects

Project ID	Project Name	ISD	Estimated Cost (\$M)
50370	Replace New London to Kokomo Highland Park 230 kV Line	2/12/2027	\$2.0
50374	Upgrade Dresser 345 kV Line	7/1/2027	\$11.6

4.3.10 GridLiance Heartland LLC (GLH)

GridLiance Heartland LLC and MISO are not recommending any new projects for MTEP25.

4.3.11 Henderson Municipal Power & Light (HMPL)

Henderson Municipal Power & Light and MISO are not recommending any new projects for MTEP25.

4.3.12 Hoosier Energy REC, Inc. (HE)

HOOSIER ENERGY

MTEP25 Summary

7
Total Projects

\$119M
Investment



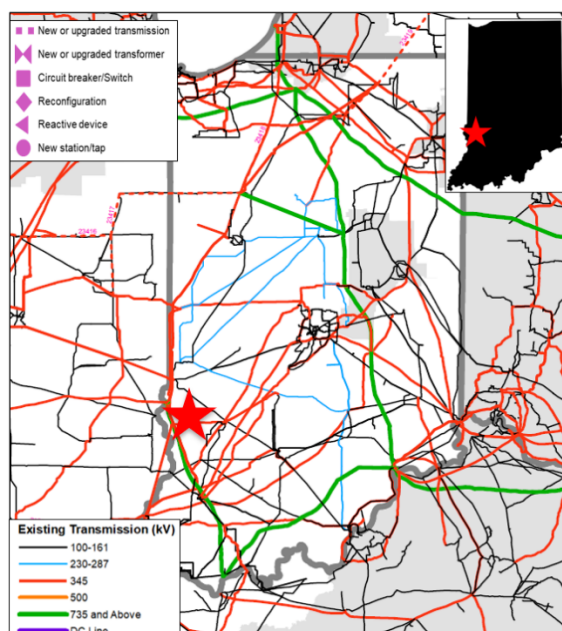


Other Projects

Project ID	Project Name	Other Breakdown	ISD	Estimated Cost (\$M)
50490	Merom Station 345 kV Expansion and New 345 kV line	Load Growth	12/1/2030	\$14.0
50491	New Ellettsville 345 kV Station	Load Growth	1/1/2035	\$20.0
50492	Expand Wheeler Creek 138 kV Station	Local Reliability	12/1/2029	\$4.7
50493	Rebuild Ashland Tap - Cisne Junction 69 kV Line	Local Reliability	12/1/2028	\$9.5
*50599	New Merom 345 kV Substation Load Addition	Load Growth	7/1/2026	\$12.8
*50614	New Marble Hill 345 kV Station and Load	Load Growth	10/1/2027	\$20.5
*50698	New Scotland 345/69 kV Substation	Load Growth	12/1/2029	\$38.0

* Project studied through Expedited Project Review (EPR) process.

50599 – New Merom 345 kV Substation Load Addition



Submitting TO	HOOSIER ENERGY
Project #	50599
Project Name	New Merom 345 kV Substation Load Addition
Project Type	Other
Project Description	Extend a new 345kV line from Merom Transmission Station, approximately 1-mile, to a new data center. The data center has a total estimated load of 620 MW at 95% PF (653 MVA, 204 MVAR).
System Need	A new data center customer has plans to construct a 620 MW facility within Hoosier Energy's service territory, approximately 1-mile from Hoosier Energy's Merom Transmission Station. The is planning an in-service date of July 2026. The full ramp-up to 620 MW load is planned for service by July 2027.
Current Cost	\$13M
Expected ISD	7/1/2026
Target Appendix	A

Figure 4.3.12-1: P50599 Geographic transmission map of project area and MTEP Portal project details. Project submitted through the Expedited Project Review (EPR). MISO performed a complete TPL-001 analysis, and no new or worsened reliability issues were identified as a result.



50614 – New Marble Hill 345 kV Station and Load

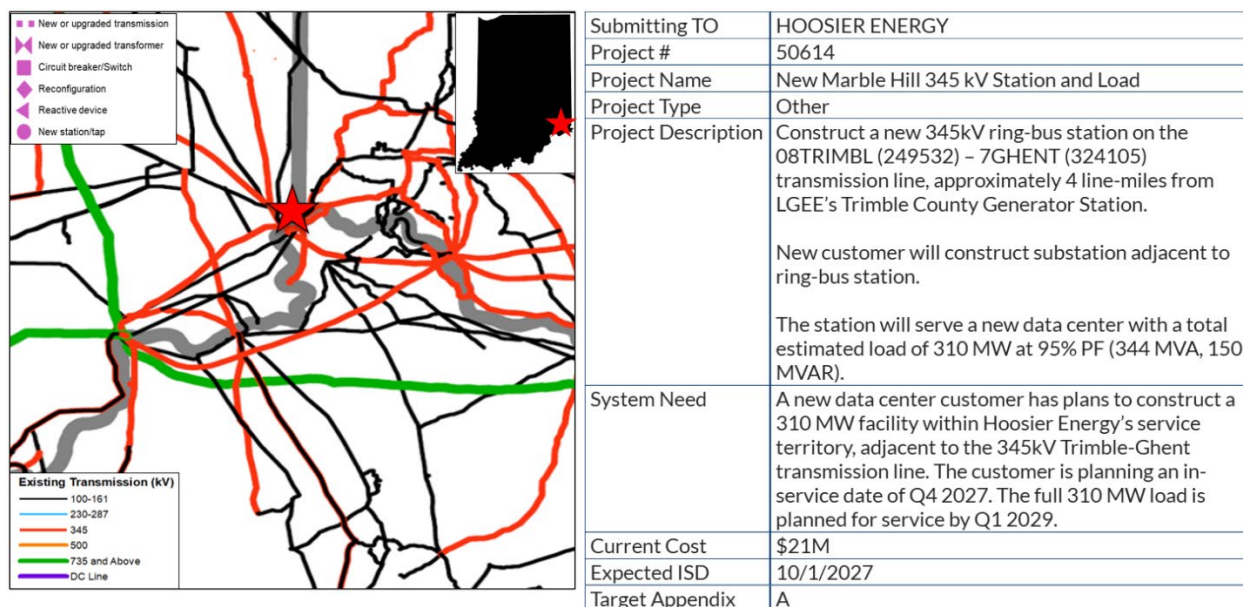


Figure 4.3.12-2: P50614 Geographic transmission map of project area and MTEP Portal project details.

Project submitted through the Expedited Project Review (EPR) process. MISO performed TPL-001-5.1 no harm analysis utilizing N-1 and N-1-1 contingencies centered around the point of interconnection of the EPR. New TPL violations and worsened reliability issues were identified and resolved without requiring additional MISO projects and MISO coordinated with impacted neighboring entities based on the analysis results.



4.3.13 Indianapolis Power & Light Company (IPL)

INDIANAPOLIS POWER & LIGHT COMPANY

MTEP25 Summary

15
Total Projects

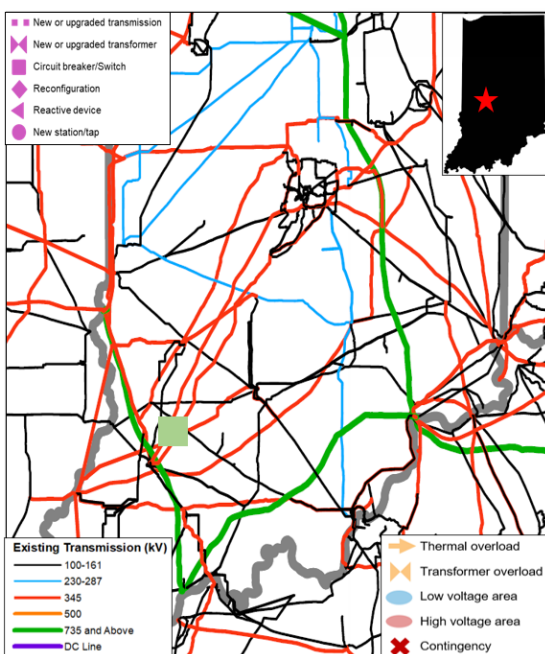
\$159.6M
Investment





Baseline Reliability Projects

50216 – Upgrade Petersburg 138 kV Breakers - 3 Breakers



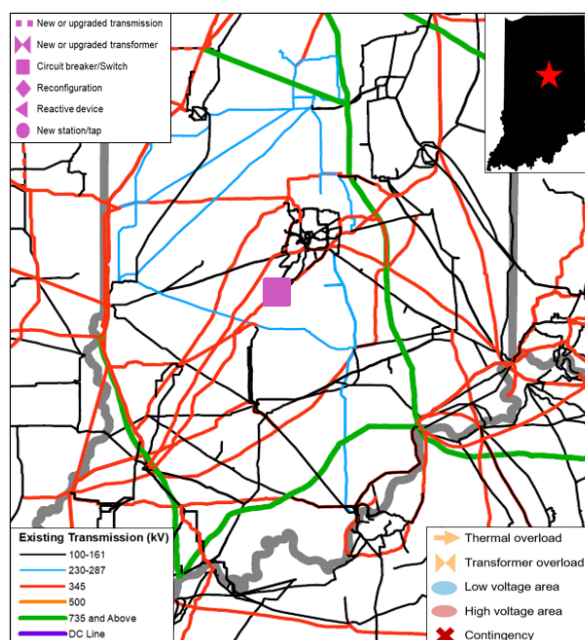
Submitting TO	INDIANAPOLIS POWER & LIGHT COMPANY
Project #	50216
Project Name	Upgrade Petersburg 138 kV Breakers - 3 Breakers
Project Type	BRP
Project Description	Upgrade existing 138 kV Petersburg breakers 6, 7, & 9 from 40 kA to 63 kA.
System Need	MISO MTEP24 TPL-001-5 R2.3 annual assessment demonstrated exceedances of the existing breaker interrupting capabilities up to 104.9%. Project submitted as Corrective Action Plan pursuant to TPL-001-5 R2.8.
Current Cost	\$1M
Expected ISD	12/1/2031
Target Appendix	A

Figure 4.3.13-1: P50216 Geographic transmission map of project area and MTEP Portal project details.

Project Justification: Short circuit studies identified the required need.



50217 – Upgrade Stout South Breakers - 12 Breakers 138 kV

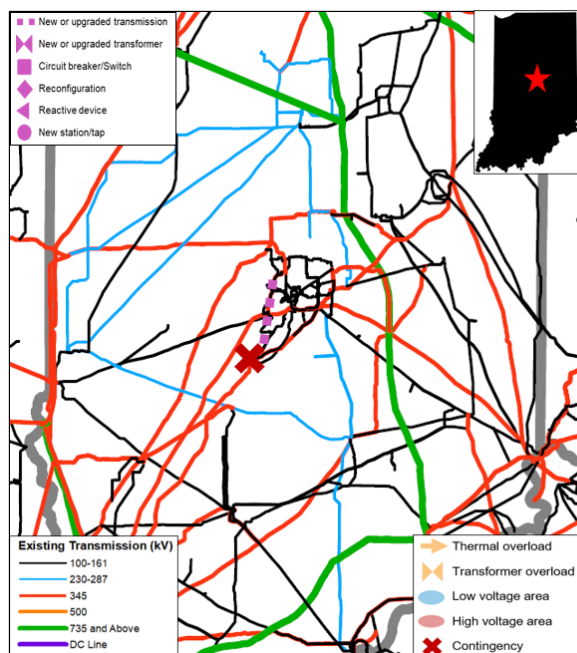


Submitting TO	INDIANAPOLIS POWER & LIGHT COMPANY
Project #	50217
Project Name	Upgrade Stout South Breakers - 12 Breakers 138 kV
Project Type	BRP
Project Description	Upgrade Stout South 138 kV breakers 1A, 2A, 2C, 3A, 3B, 3C, 4A, 4C, 5A, 5B, 5C, and 5D from 63 kA to 80 kA.
System Need	MISO MTEP24 TPL-001-5 R2.3 annual assessment demonstrated exceedances of the existing breaker interrupting capabilities up to 104.3%. Project submitted as Corrective Action Plan pursuant to TPL-001-5 R2.8.
Current Cost	\$3M
Expected ISD	12/1/2031
Target Appendix	A

Figure 4.3.13-2: P50217 Geographic transmission map of project area and MTEP Portal project details.

Project Justification: Short-circuit studies identified the required need.

50306 – Rebuild Southwest-Stout CT_132-02_138 kV Line



Submitting TO	INDIANAPOLIS POWER & LIGHT COMPANY
Project #	50306
Project Name	Rebuild Southwest-Stout CT_132-02_138 kV Line
Project Type	BRP
Project Description	Rebuild existing 138 kV 132-02 Southwest-Stout CT line to new Summer rating of 2000A (478 MVA). New conductor and towers, with review of necessary terminal equipment to be replaced.
System Need	MISO MTEP24 TPL-001-5 R3 annual assessment demonstrated 20 unique N-1-1 events resulting in thermal overloads > 120% and up to 142.28%. Project submitted as Corrective Action Plan pursuant to TPL-001-5 R2.7.
Current Cost	\$9M
Expected ISD	12/31/2029
Target Appendix	A

Figure 4.3.13-3: P50306 Geographic transmission map of project area and MTEP Portal project details.

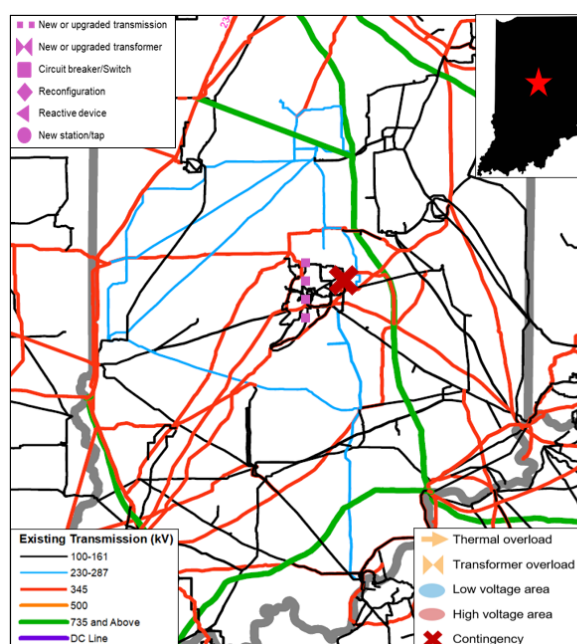


Project Justification: The [IPL] Southwest – [IPL] Stout CT 138 kV line becomes overloaded to one hundred forty-two (142%) percent in year 2026 for a NERC defined category P6 contingency event. Rebuilding the [IPL] Southwest – [IPL] Stout CT 138 kV line will increase the summer emergency rating of the line.

Cont. Type	Limiting Element	Pre-Project (post-cont.) Loading (%)	Post-Project (post-cont.) Loading (%)
P6	[IPL] Southwest – [IPL] Stout CT 138 kV line	142	67

Table 4.3.13-1: P50306 Thermal loading drivers.

50307 – Rebuild Southwest-Northwest 132-04 138 kV Line



Submitting TO	INDIANAPOLIS POWER & LIGHT COMPANY
Project #	50307
Project Name	Rebuild Southwest-Northwest 132-04 138 kV Line
Project Type	BRP
Project Description	Rebuild existing 138 kV 132-04 Southwest-Northwest line to new Summer rating of 2000A (478 MVA). New conductor and towers, with review of necessary terminal equipment to be replaced.
System Need	MISO MTEP24 TPL-001-5 R3 annual assessment demonstrated 12 unique N-1-1 events resulting in thermal overloads >120% and up to 127.42%. Project submitted as Corrective Action Plan pursuant to TPL-001-5 R2.7.
Current Cost	\$15M
Expected ISD	12/31/2029
Target Appendix	A

Figure 4.3.13-4: P50307 Geographic transmission map of project area and MTEP Portal project details.

Project Justification: The [IPL] Northwest – [IPL] Southwest 138 kV line becomes overloaded to one hundred fifty-two (152%) percent in year 2026 for a NERC defined category P6 contingency event. Rebuilding [IPL] Northwest – [IPL] Southwest 138 kV line project will increase the summer emergency rating of the line.

Cont. Type	Limiting Element	Pre-Project (post-cont.) Loading (%)	Post-Project (post-cont.) Loading (%)
P6	[IPL] Northwest – [IPL] Southwest 138 kV line	152	46

Table 4.3.13-2: P50307 Thermal loading drivers.



50311 – Rebuild Stout North-Sanitation Belmont-Southwest_132-01_&_132-74_138 kV Lines

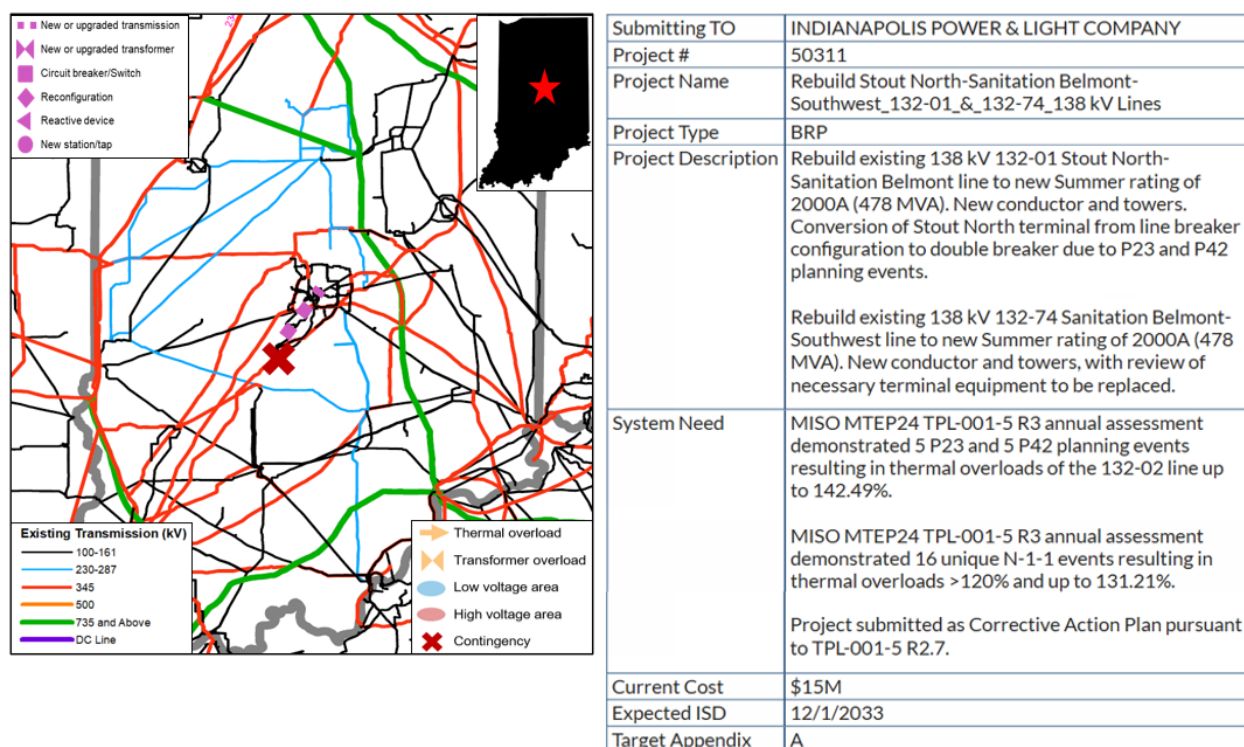


Figure 4.3.13-5: P50311 Geographic transmission map of project area and MTEP Portal project details.

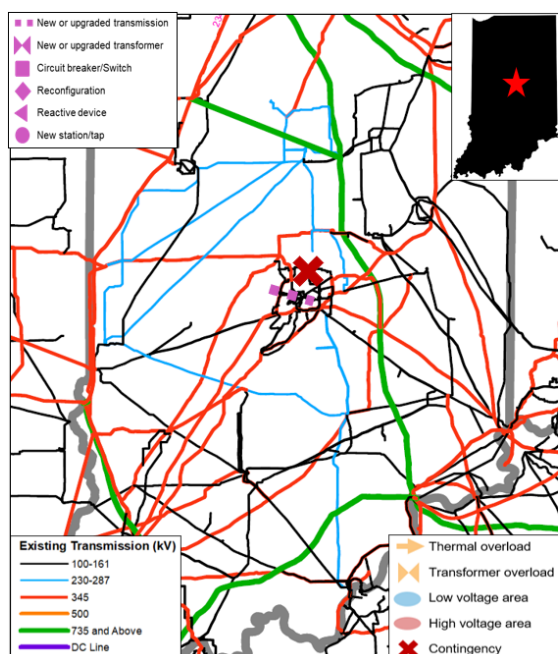
Project Justification: The [IPL] Sanitation Belmont – [IPL] Southwest 138 kV line is overloaded to one hundred twenty-seven (127%) and [IPL] Sanitation Belmont – [IPL] Stout North 138 kV line is overloaded to one hundred thirty-one (131%) percent in a year 2026 for NERC defined category P6 contingency events. Rebuilding Stout North-Sanitation Belmont-Southwest_132-01_&_132-74_138 kV lines will increase the summer emergency rating of these lines.

Cont. Type	Limiting Element	Pre-Project (post-cont.) Loading (%)	Post-Project (post-cont.) Loading (%)
P6	[IPL] Sanitation Belmont – [IPL] Southwest 138 kV line	127	64
P6	[IPL] Sanitation Belmont – [IPL] Stout North 138 kV line	131	66

Table 4.3.13-3: P50311 Thermal loading drivers.



50312 – Rebuild Southwest-Lilly South 132-10 138 kV Line



Submitting TO	INDIANAPOLIS POWER & LIGHT COMPANY
Project #	50312
Project Name	Rebuild Southwest-Lilly South 132-10 138 kV Line
Project Type	BRP
Project Description	Rebuild existing 138 kV 132-10 Southwest-Lilly South line to new Summer rating of 2000A (478 MVA). New conductor and towers, with review of necessary terminal equipment to be replaced.
System Need	MISO MTEP24 TPL-001-5 R3 annual assessment demonstrated 3 unique N-1-1 events resulting in thermal overloads >120% and up to 121.3%. Project submitted as Corrective Action Plan pursuant to TPL-001-5 R2.7.
Current Cost	\$7M
Expected ISD	12/1/2033
Target Appendix	A

Figure 4.3.13-6: P50312 Geographic transmission map of project area and MTEP Portal project details.

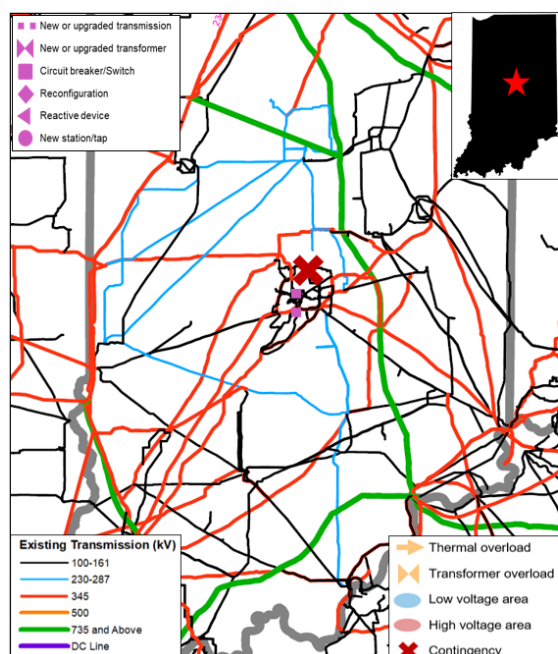
Project Justification: The [IPL] Lilly South – [IPL] Southwest 138 kV line becomes overloaded to one hundred twenty-one (121%) percent in a year 2026 for a NERC defined category P6 contingency event. Rebuilding Southwest-Lilly South 132-10 138 kV line project will increase the summer emergency rating of [IPL] Lilly South – [IPL] Southwest 138 kV line.

Cont. Type	Limiting Element	Pre-Project (post-cont.) Loading (%)	Post-Project (post-cont.) Loading (%)
P6	[IPL] Lilly South – [IPL] Southwest 138 kV line	121	57

Table 4.3.13-4: P50312 Thermal loading drivers.



50313 – Rebuild Lilly South-Center 132-61 138 kV Line



Submitting TO	INDIANAPOLIS POWER & LIGHT COMPANY
Project #	50313
Project Name	Rebuild Lilly South-Center 132-61 138 kV Line
Project Type	BRP
Project Description	Rebuild existing 138 kV 132-61 Lilly South-Center line to new Summer rating of 2000A (478 MVA). New conductor and towers, with review of necessary terminal equipment to be replaced.
System Need	MISO MTEP24 TPL-001-5 R3 annual assessment demonstrated 5 unique N-1-1 events resulting in thermal overloads >120% and up to 131.44%. Project submitted as Corrective Action Plan pursuant to TPL-001-5 R2.7.
Current Cost	\$3M
Expected ISD	12/1/2033
Target Appendix	A

Figure 4.3.13-7: P50313 Geographic transmission map of project area and MTEP Portal project details.

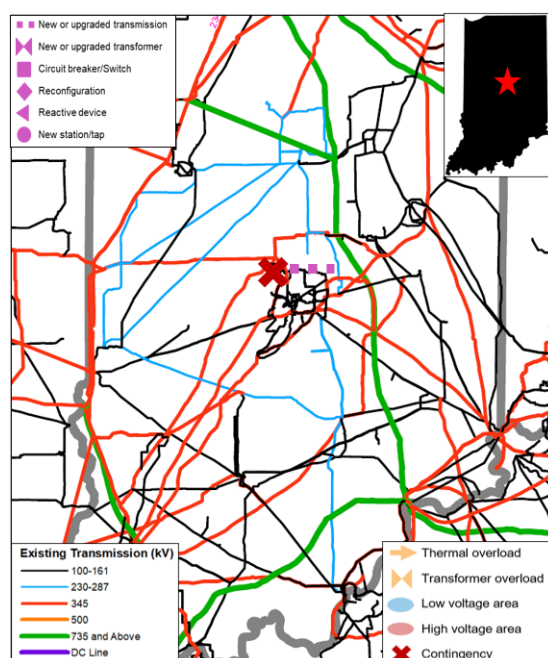
Project Justification: The [IPL] Lilly South – [IPL] Center 138 kV line becomes overloaded to one hundred twenty (120%) percent in a year 2026 for a NERC defined category P6 contingency event. Rebuilding Lilly South-Center 132-61 138 kV Line project will increase the summer emergency rating of this line.

Cont. Type	Limiting Element	Pre-Project (post-cont.) Loading (%)	Post-Project (post-cont.) Loading (%)
P6	[IPL] Lilly South – [IPL] Center 138 kV line	120	28

Table 4.3.13-5: P50313 Thermal loading drivers.



50314 – Rebuild Georgetown-North 132-86 138 kV Line



Submitting TO	INDIANAPOLIS POWER & LIGHT COMPANY
Project #	50314
Project Name	Rebuild Georgetown-North 132-86 138 kV Line
Project Type	BRP
Project Description	Rebuild existing 138 kV 132-86 Georgetown-North line to new Summer rating of 1600A (382 MVA). New conductor and towers, with review of necessary terminal equipment to be replaced.
System Need	MISO MTEP24 TPL-001-5 R3 annual assessment demonstrated 4 P23 and 2 P42 planning events resulting in thermal overloads of the 132-86 line up to 107.39%. Project submitted as Corrective Action Plan pursuant to TPL-001-5 R2.7.
Current Cost	\$13M
Expected ISD	12/31/2029
Target Appendix	A

Figure 4.3.13-8: P50314 Geographic transmission map of project area and MTEP Portal project details.

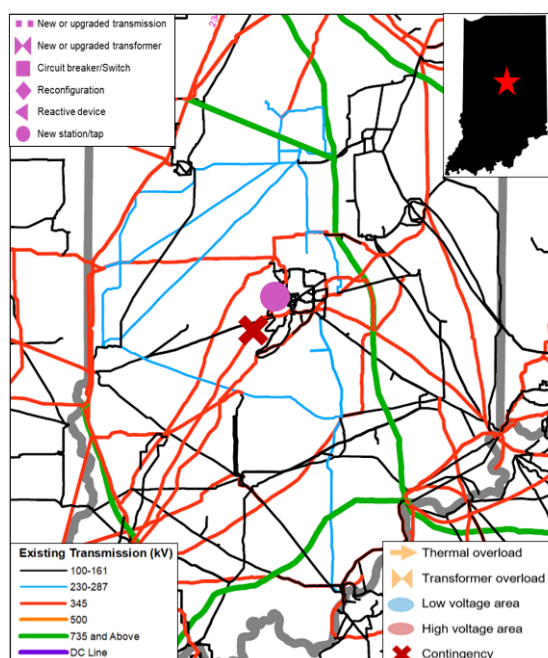
Project Justification: The [IPL] Georgetown – [IPL] North 138 kV line becomes overloaded to one hundred eight (108%) percent in year 2026 for a NERC defined category P2 and P4 contingency event. Rebuilding [IPL] Georgetown – [IPL] North 138 kV line project will increase the summer emergency rating of this line.

Cont. Type	Limiting Element	Pre-Project (post-cont.) Loading (%)	Post-Project (post-cont.) Loading (%)
P2	[IPL] Georgetown – [IPL] North 138 kV line	108	68

Table 4.3.13-6: P50314 Thermal loading drivers.



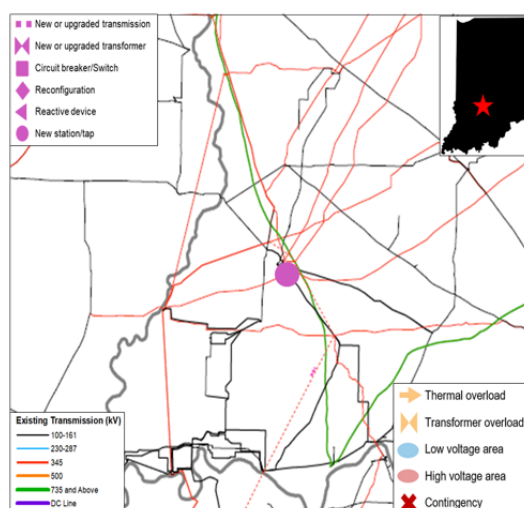
50315 – New Ralston 138 kV Substation Eagle Valley Reinforcement



Submitting TO	INDIANAPOLIS POWER & LIGHT COMPANY
Project #	50315
Project Name	New Ralston 138 kV Delivery Point
Project Type	Other
Project Description	New 138 kV Ralston substation looped in on 132-23 Eagle Valley-Sanitation Southport line. Provide general distribution service to Indianapolis area.
System Need	Provide load relief to nearby delivery points for growing Indianapolis load.
Current Cost	\$10M
Expected ISD	3/1/2031
Target Appendix	A

Figure 4.3.13-9: P50315 Geographic transmission map of project area and MTEP Portal project details.

50722 – New Pond Creek 345 : 138 kV Substation



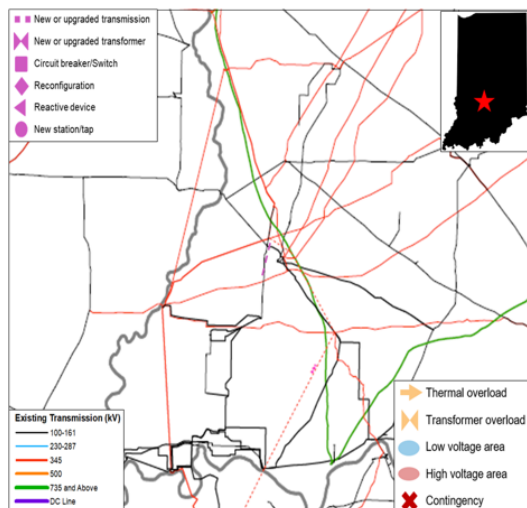
Submitting TO	INDIANAPOLIS POWER & LIGHT COMPANY
Project #	50722
Project Name	New Pond Creek 345 : 138 kV Substation
Project Type	BRP
Project Description	New 345 : 138 kV substation in Pike County, Indiana to address thermal overloads at Petersburg substation
System Need	New 345 : 138 kV substation in Pike County, Indiana to address thermal overloads at Petersburg substation
Current Cost	\$40M
Expected ISD	6/1/2029
Target Appendix	A

Figure 4.3.13-10: P50722 Geographic transmission map of project area and MTEP Portal project details.

Project submitted as a Corrective Action Plan for WVPA 50628 LEAP 2 Expedited Project Review (EPR).



50723 – Uprate IPL Petersburg to Cato 138 kV Equipment

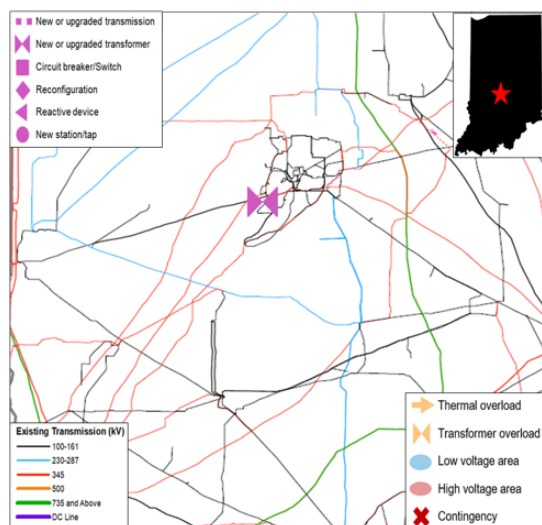


Submitting TO	INDIANAPOLIS POWER & LIGHT COMPANY
Project #	50723
Project Name	Uprate IPL Petersburg to Cato 138 kV Equipment
Project Type	BRP
Project Description	Replace IPL leads and wave trap
System Need	EPR BRP Mitigation
Current Cost	\$4M
Expected ISD	12/31/2028
Target Appendix	A

Figure 4.3.13-11: P50723 Geographic transmission map of project area and MTEP Portal project details.

Project submitted as a Corrective Action Plan for WVPA 50628 LEAP 2 Expedited Project Review (EPR).

50727 – Replace Thompson 345/138/13.75 MVA Autotransformer at Thompson Substation



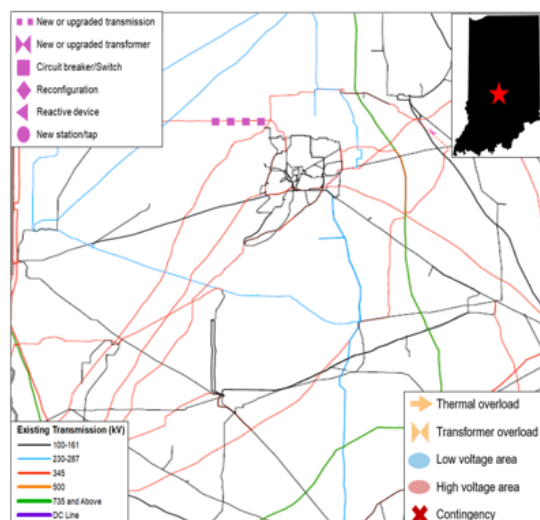
Submitting TO	INDIANAPOLIS POWER & LIGHT COMPANY
Project #	50727
Project Name	Replace Thompson 345/138/13.75 MVA Autotransformer at Thompson Substation
Project Type	BRP
Project Description	Replace 275 MVA, 345 : 138 kV Autotransformer with 500 MVA, 345 : 138 kV Autotransformer.
System Need	EPR BRP TPL-001 Required, N-1-1 of P1-2 Thompson-Rockville transmission line and P1-3 of Stout autotransformer
Current Cost	\$15M
Expected ISD	12/31/2029
Target Appendix	A

Figure 4.3.13-12: P50727 Geographic transmission map of project area and MTEP Portal project details.

Project submitted as a Corrective Action Plan for WVPA 50628 LEAP 2 Expedited Project Review (EPR).



50731 – IPL Adoption of Seasonal Ratings - BRP



Submitting TO	INDIANAPOLIS POWER & LIGHT COMPANY
Project #	50731
Project Name	IPL Adoption of Seasonal Ratings - BRP
Project Type	BRP
Project Description	Indianapolis Power & Light is changing its Facility Rating Methodology to adopt seasonal ratings. This project covers all Facilities changes classified as BRPs.
System Need	FERC 881 / local reliability.
Current Cost	\$0M
Expected ISD	12/31/2029
Target Appendix	A

Figure 4.3.13-13: P50731 Geographic transmission map of project area and MTEP Portal project details.

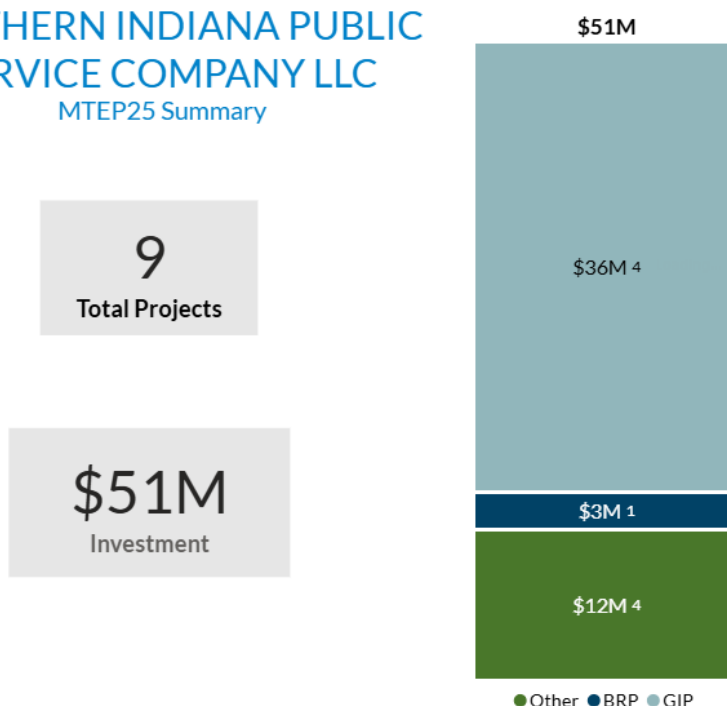
Other Projects

Project ID	Project Name	Other Breakdown	ISD	Estimated Cost (\$M)
50502	New Brownsburg East 138 kV Substation	Load Growth	12/31/2025	\$8.6
50503	New Pleasant Acres Substation Feed 2 138 kV line	Load Growth	12/31/2025	\$2.0



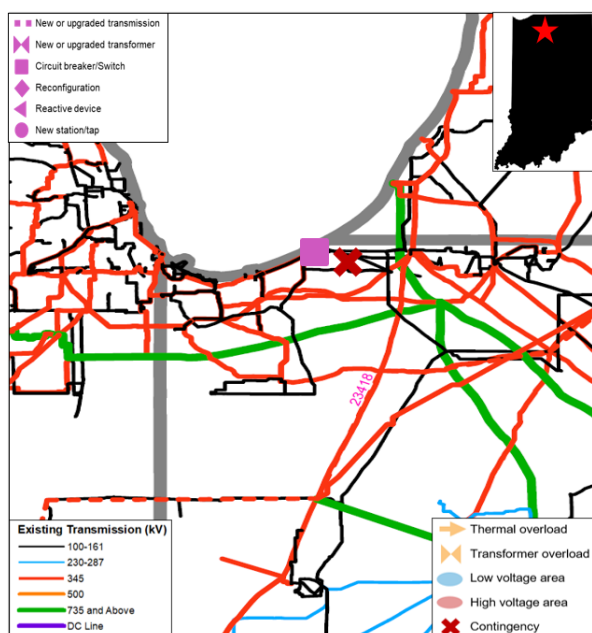
4.3.14 Northern Indiana Public Service Company (NIPSCO)

NORTHERN INDIANA PUBLIC SERVICE COMPANY LLC MTEP25 Summary



Baseline Reliability Projects

50390 – New Dune Acres 138 kV Breaker additions



Submitting TO	NORTHERN INDIANA PUBLIC SERVICE COMPANY LLC
Project #	50390
Project Name	New Dune Acres 138 kV Breaker additions
Project Type	BRP
Project Description	Add Breakers to existing lines where feasible to complete double breaker double bus design.
System Need	MTEP24 studies show thermal violations for common breaker at the Dune Acres 138kV substation. Substation has 2 buses with several incoming lines on single breaker vs double. Adding breakers will eliminate multiple outages for single breaker failure.
Current Cost	\$3M
Expected ISD	5/31/2029
Target Appendix	A

Figure 4.3.14-1: P50390 Geographic transmission map of project area and MTEP Portal project details.



Project Justification: The [NIPS] Dune Acres – [NIPS] Michigan City 138 kV line becomes overloaded to one hundred twelve (112%) percent in year 2029 for a NERC defined category P2 contingency event. The new Dune Acres 138 kV Breaker additions project adds breakers that will eliminate multiple outages for single breaker failure and resolve the thermal overload on the line.

Cont. Type	Limiting Element	Pre-Project (post-cont.) Loading (%)	Post-Project (post-cont.) Loading (%)
P2	The [NIPS] Dune Acres – [NIPS] Michigan City 138 kV line	112.9	75

Table 4.3.14-1: P50390 Thermal loading drivers.

Other Projects

Project ID	Project Name	Other Breakdown	ISD	Estimated Cost (\$M)
50104	Upgrade PJM project b3775.8 St. John to Crete 345 kV	Local Reliability	6/1/2026	\$1.2
50105	Reconfigure PJM project b3775.9. Green Acres 345kV substation	Local Reliability	6/1/2026	\$2.2
50389	New Leesburg 345/138kV Transformer addition	Local Reliability	12/31/2027	\$8.0
50488	Upgrade Dumont to Stillwell 138 kV line (PJM Project B3775.11)	Local Reliability	12/1/2026	\$0.6

Generator Interconnection Projects

Project ID	Project Name	ISD	Estimated Cost (\$M)
50163	New J1358 IC Facilities Interconnection 138 kV	5/31/2028	\$23.4
50170	New J1355 IC Facilities Interconnection 138 kV	6/1/2028	\$4.2
50171	Schahfer 345 kV substation Redundancy	7/30/2026	\$0.5
50538	J1386 IC Facilities	5/31/2028	\$8.1

4.3.15 Pioneer Transmission, LLC (PTx)

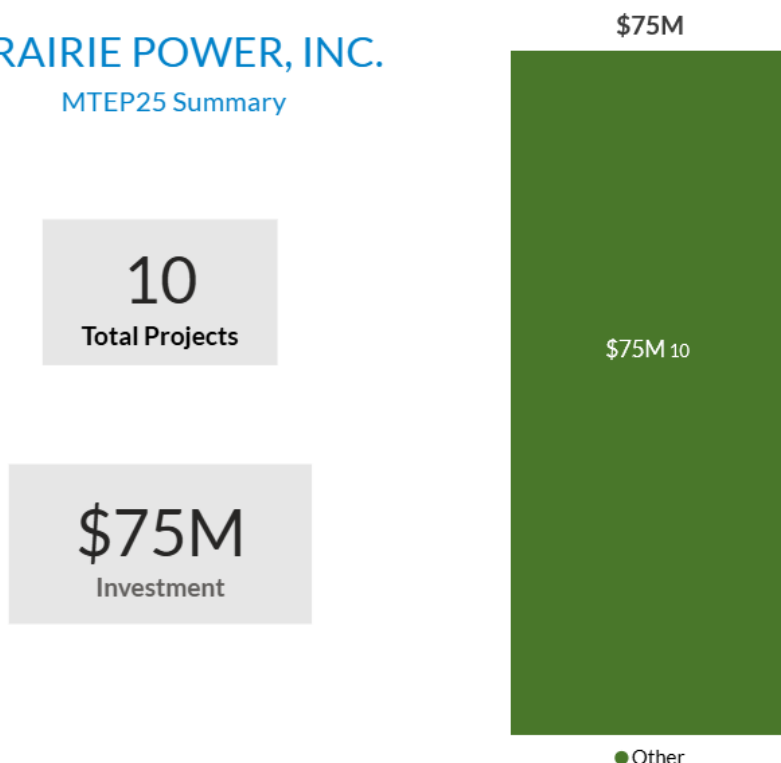
Pioneer Transmission, LLC and MISO are not recommending any new projects for MTEP25.



4.3.16 Prairie Power, Inc. (PPI)

PRAIRIE POWER, INC.

MTEP25 Summary



Other Projects

Project ID	Project Name	Other Breakdown	ISD	Estimated Cost (\$M)
50381	Rebuild Riverside-Hardin Tap 69 kV line	Local Reliability	12/1/2026	\$5.9
50405	Relocate Berlin-Amos 69 kV line	Age and Condition	12/1/2029	\$11.2
50406	Rebuild Breiner-Kington 69 kV line	Age and Condition	12/1/2027	\$5.7
50407	Rebuild Macomb-Spring Lake Junction 69 kV line	Age and Condition	12/1/2027	\$2.0
50408	Rebuild El Dara Junction-Hadley 69 kV line	Age and Condition	12/1/2029	\$2.8
50409	New Andrew-Salisbury Tap 69 kV line	Local Reliability	12/1/2028	\$1.1
50411	New Tice-Virginia 69 kV line	Local Reliability	12/1/2030	\$20.1
50412	New Paragon-Grove City 69 kV line	Local Reliability	12/1/2030	\$19.9
50413	New Edinburg 69 kV breaker station	Local Reliability	12/1/2030	\$3.4
50414	New Henton 69 kV breaker station	Local Reliability	12/1/2029	\$3.4



4.3.17 Republic Transmission, LLC (RTx)

Republic Transmission and MISO are not recommending any new projects for MTEP25.

4.3.18 Southern Indiana Gas & Electric Company (SIGE)

Southern Indiana Gas & Electric Company

MTEP25 Summary



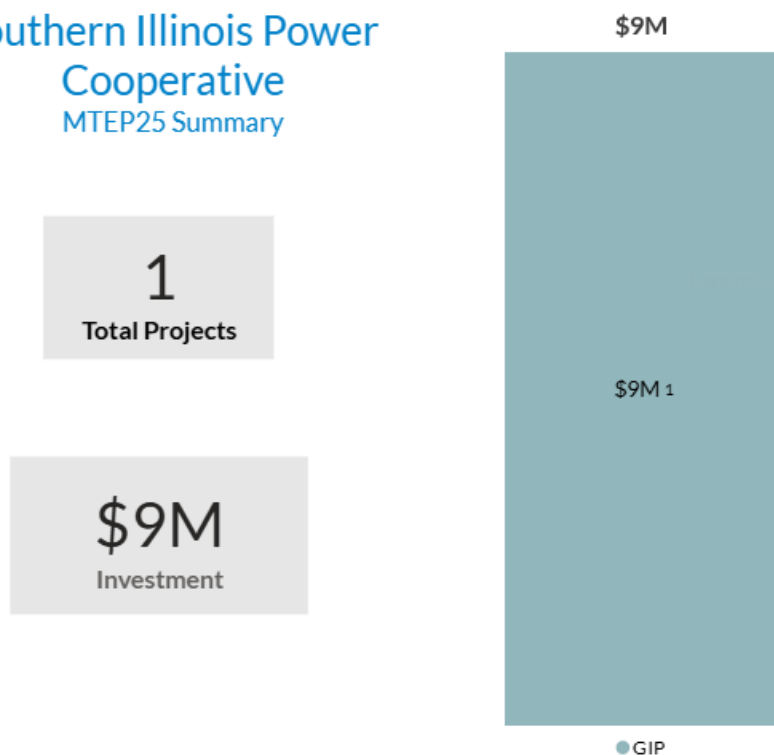
Other Projects

Project ID	Project Name	Other Breakdown	ISD	Estimated Cost (\$M)
50241	Replace Boonville T1 69 kV	Age and Condition	12/31/2027	\$2.4
50245	Replace Culley 138 kV CCVT Boxes	Age and Condition	12/31/2027	\$1.6
50247	Rebuild Elliott Transformer and Substation 69 kV	Local Reliability	12/31/2027	\$15.7
50248	Replace Newburgh Circuit Switcher 69 kV	Age and Condition	12/31/2027	\$1.6
50249	Rebuild Dubois T2 138/69 kV Transformer	Local Reliability	12/31/2027	\$7.9
50316	Rebuild Z84 Duff to Petersburg 138 kV	Age and Condition	12/31/2028	\$38.0
50326	Rebuild Z95 Northwest to AB Brown 138 kV	Age and Condition	12/31/2027	\$8.7



4.3.19 Southern Illinois Power Cooperative (SIPC)

Southern Illinois Power Cooperative MTEP25 Summary



Generator Interconnection Projects

Project ID	Project Name	ISD	Estimated Cost (\$M)
50637	Big Muddy Solar - J1303 Generator Interconnection	10/1/2026	\$9.4



4.3.20 Wabash Valley Power Association, Inc. (WVPA)

WABASH VALLEY POWER ASSOCIATION, INC. MTEP25 Summary

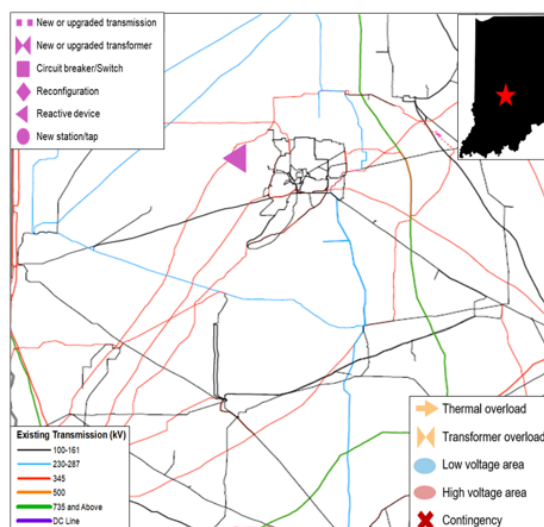
19
Total Projects

\$849M
Investment



Baseline Reliability Projects

50691 – LEAP Phase 2 EPR Mitigations



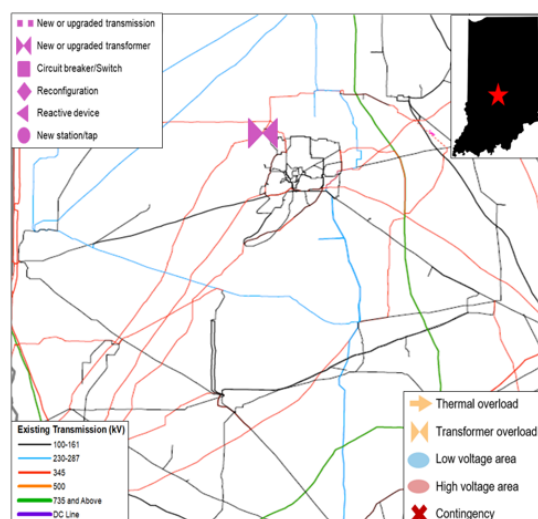
Submitting TO	WABASH VALLEY POWER ASSOCIATION, INC.
Project #	50691
Project Name	LEAP Phase 2 EPR Mitigations
Project Type	BRP
Project Description	Reactive and thermal project mitigations for LEAP Phase 2 (MTEP 50208) area large load.
System Need	Reliability
Current Cost	\$45M
Expected ISD	6/29/2029
Target Appendix	A

Figure 4.3.20-1: P50691 Geographic transmission map of project area and MTEP Portal project details.

Project submitted as a Corrective Action Plan for WVPA 50628 LEAP 2 Expedited Project Review (EPR).



50728 – Add 3rd 345/138 kV Bank at Edwards Sub



Submitting TO	WABASH VALLEY POWER ASSOCIATION, INC.
Project #	50728
Project Name	Add 3rd 345/138kV Bank at Edwards Sub
Project Type	BRP
Project Description	This is part of LEAP Phase 2 EPR mitigations. This will add a third 606MVA bank to Edwards substation, as well as updating normal and emergency line ratings for the LEAP 138kV lines
System Need	This project is driven by the recent LEAP EPR
Current Cost	\$15M
Expected ISD	6/30/2029
Target Appendix	A

Figure 4.3.20-2: P50728 Geographic transmission map of project area and MTEP Portal project details.

Project submitted as a Corrective Action Plan for WVPA 50628 LEAP 2 Expedited Project Review (EPR).

Other Projects

Project ID	Project Name	Other Breakdown	ISD	Estimated Cost (\$M)
*50208	New LEAP Transmission Network	Load Growth	12/31/2026	\$222.2
50286	Lebanon Industrial 2nd 69 kV Source	Local Reliability	10/1/2027	\$30.3
50287	Gessie 69 kV Rebuild	Age and Condition	7/6/2026	\$7.2
50292	Fishback Creek 69/12 kV Substation	Load Growth	12/31/2028	\$6.0
50293	6923 69kV Ring Bus	Local Reliability	12/31/2029	\$6.8
50294	Romine 69 kV Switching Station	Local Reliability	12/31/2028	\$6.8
50295	69154 69 kV Ring Bus	Local Reliability	12/31/2030	\$6.8
50296	Dover 69/12 kV Substation	Load Growth	12/31/2027	\$5.5
50297	Milnon 69/12 kV Substation	Load Growth	11/24/2027	\$6.6
50298	Four Corners 69/12 kV Substation	Load Growth	12/1/2027	\$14.1
50300	Hayworth 69/12 kV Substation	Load Growth	12/1/2027	\$10.2
50301	Maple Leaf 69 kV Line	Local Reliability	12/31/2027	\$15.0
50302	Lacrosse 69/12 kV Substation	Load Growth	12/31/2029	\$12.5
50303	Jacob Mack 2nd Bank & Source	Local Reliability	12/31/2027	\$8.6



Project ID	Project Name	Other Breakdown	ISD	Estimated Cost (\$M)
50371	Lee Hanna 69/12 kV Rebuild	Load Growth	11/1/2027	\$10.0
*50551	New Stillwell to Elderberry 345 kV Line	Local Reliability	12/31/2028	\$75.0
*50628	Upgrade LEAP Transmission Network Phase 2	Load Growth	6/30/2029	\$345.0

* Project studied through Expedited Project Review (EPR) process.

50208 – New LEAP Transmission Network

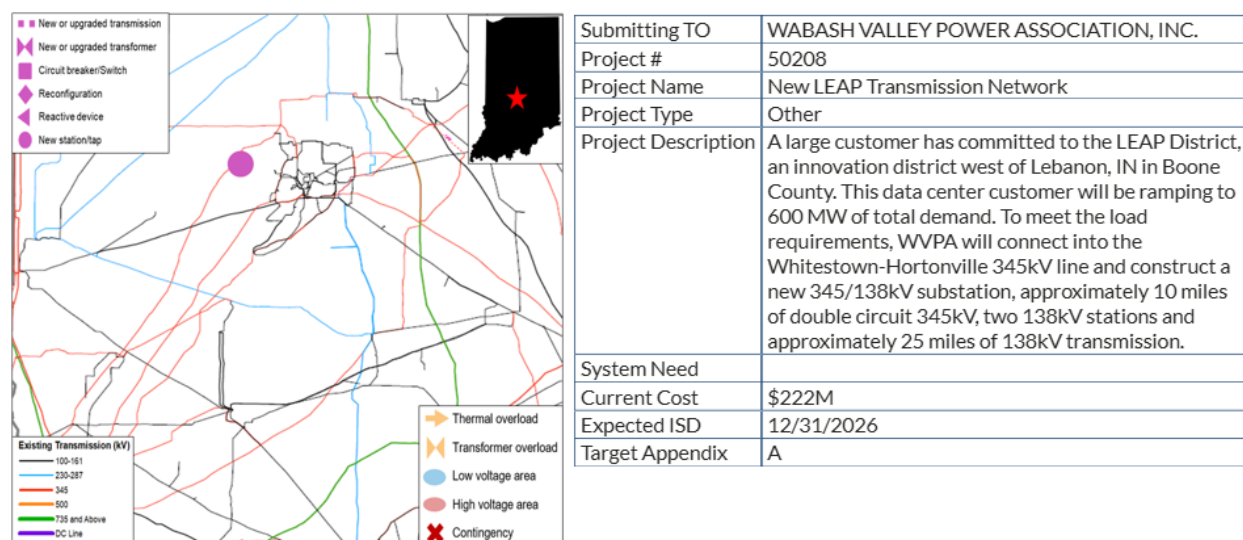


Figure 4.3.20-3: P50208 Geographic transmission map of project area and MTEP Portal project details.

Project submitted through the Expedited Project Review (EPR). MISO performed a complete TPL-001 analysis, and no new or worsened reliability issues were identified as a result.



50551 - New Stillwell to Elderberry 345 kV Line

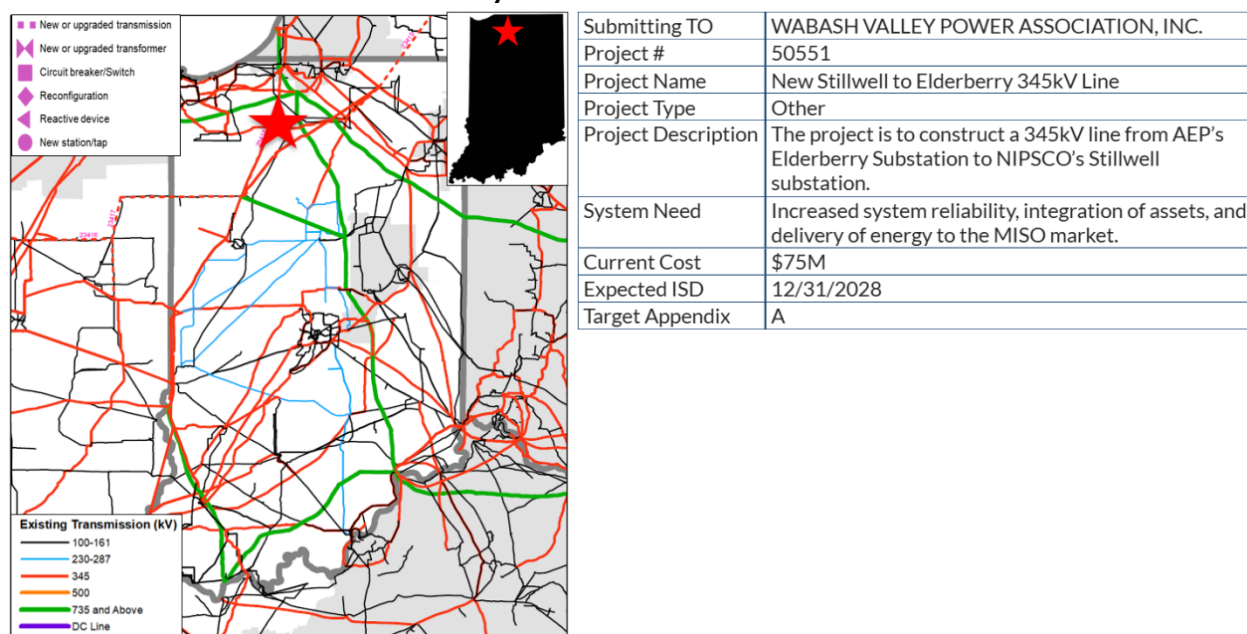


Figure 4.3.20-4: P50551 Geographic transmission map of project area and MTEP Portal project details.

Project submitted through the Expedited Project Review (EPR). MISO performed a complete TPL-001 analysis, and no new or worsened reliability issues were identified as a result.



50628 - Upgrade LEAP Transmission Network Phase 2

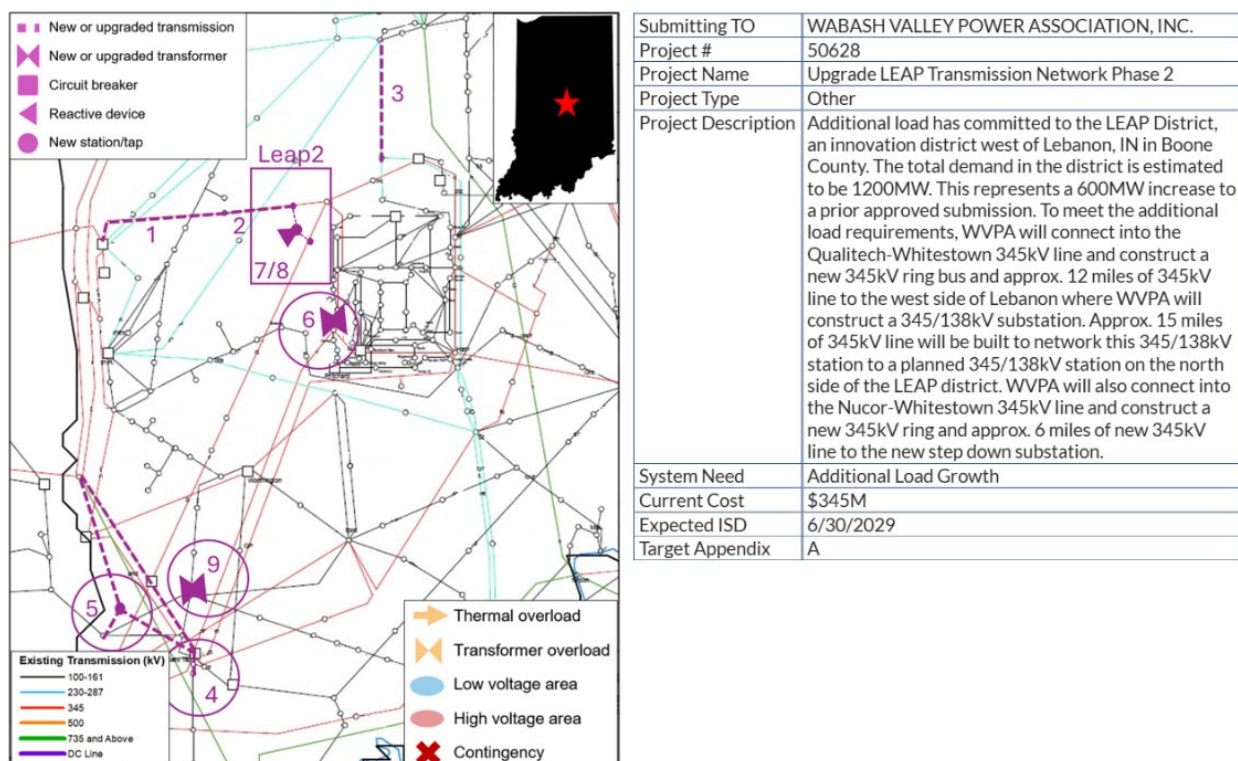


Figure 4.3.20-5: P50628 Geographic transmission map of project area and MTEP Portal project details.

Project submitted through the Expedited Project Review (EPR). MISO performed TPL-001-5.1 no harm analysis utilizing N-1 and N-1-1 contingencies centered around the point of interconnection of the EPR. New TPL violations and worsened reliability issues were identified. MISO coordinated with impacted neighboring entities based on the analysis results. All steady state (thermal and voltage) violations are resolved with newly developed Corrective Action Plans (CAPs). The following projects are a part of the CAP and the individual project details can be found within the submitting TO section:

	Project ID	Project Name	Expected ISD	Current Cost (\$M)
1	50691	[WVPA] LEAP Phase 2 EPR Mitigations	6/29/2029	\$45
2	50718	[DEI] Rebuild Cayuga to Nucor 345 kV line	6/1/2029	\$96
3	50719	[DEI] Rebuild Nucor to Wolf Creek 345 kV line	6/1/2029	\$49
4	50722	[IPL] New Pond Creek 345: 138 kV Substation	6/1/2029	\$40
5	50723	[IPL] Uprate IPL Petersburg to Cato 138 kV Equipment	12/31/2028	\$4
6	50725	[DEI] Rebuild Kokomo to Cammack to Tipton 230 kV	6/1/2029	\$66



	Project ID	Project Name	Expected ISD	Current Cost (\$M)
7	50727	[IPL] Replace Thompson 345/138/13.75 MVA Autotransformer	12/31/2029	\$15
8	50728	[WVPA] Add 3rd 345/138 kV Bank at Edwards Sub	6/30/2029	\$15



4.4 Project Justifications – East Region

East Region Overview

The MISO East Planning Region consists of six Transmission-Owners within Michigan. These Transmission Owners are:

ITC Transmission (ITCT)	Michigan Public Power Agency (MPPA)
Michigan Electric Transmission Co. (METC)	Michigan South Central Power Agency (MSCPA)
Wolverine Power Supply Cooperative Inc. (WPSC)	Lansing Board of Water & Light (LBWL)

The region contains 9725 circuit miles of transmission lines ranging from 120 kV to 345 kV. It also contains 1251 circuit miles of 69 kV sub-transmission system. The MISO East Region is interconnected with non-MISO systems: Hydro One Networks Inc. and American Electric Power to the east.

The 2027 Summer Peak planning model from the 2025 Series indicates the region contains 35 GW of generation. Installed generation capacity in the region consists mostly of coal, gas, and solar. Figure 4.4-1 shows the major load centers and generation pockets within the East Region. The load centers are typically found around larger cities in the region, i.e., Detroit, Lansing, and Grand Rapids. According to the 2027 Summer Peak planning model from the 2025 Series, the region's load is 20 GW.

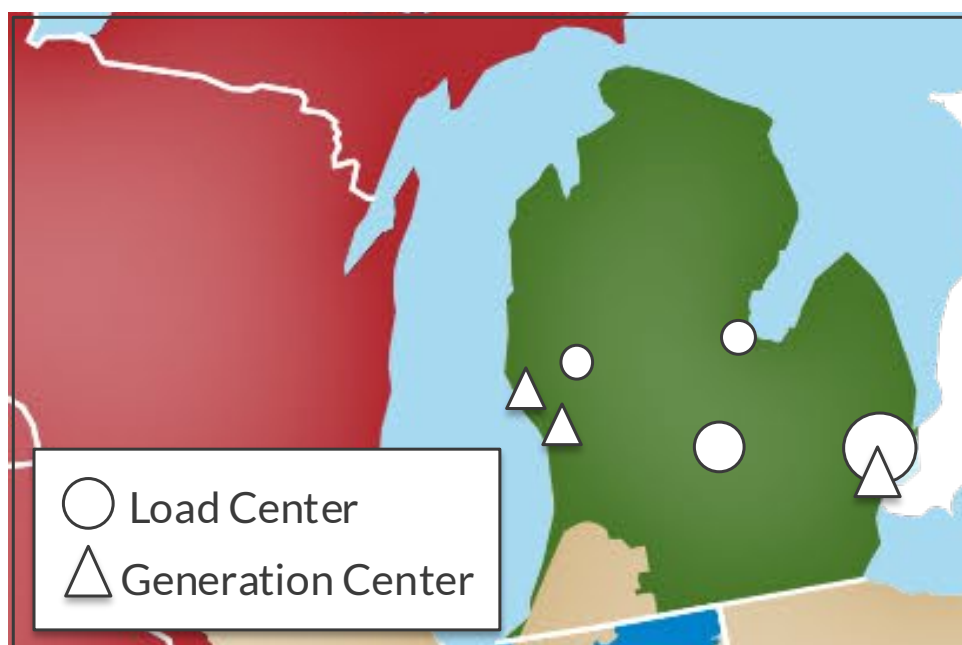
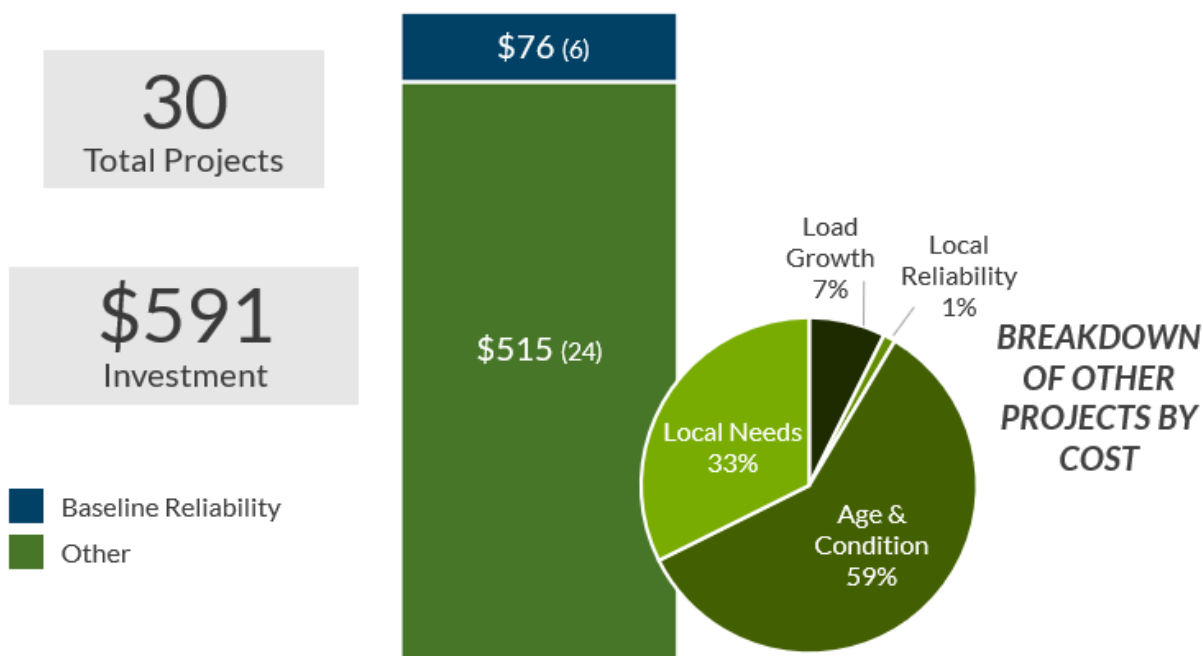


Figure 4.4-1: Generation and load centers in the East planning region.



East Planning Region Local MTEP25 Summary

(Data as of August 28, 2025; \$M, # project count)



EAST REGION HIGHLIGHTS

Transmission Miles

139 total line miles
38% new miles, 62% upgraded miles

Spot Load Additions

20 MW

Expedited Project Reviews (EPRs)

1 approved

Other Projects:

87% of projects classified as Other Projects
Out of the Top 10 projects, 90% are Other Projects





The ten largest project investments in the MISO East region represent \$404 million (68%) of the \$591 million total recommended projects for the East Region, or 3% of the \$12.4 billion total recommended in the MISO footprint. The locations of these projects are shown in Figure 4.4-2. Projects that are blanket expenditures (relays, physical security, etc.) are excluded from this list.

East Region Top 10 Local MTEP25 Projects

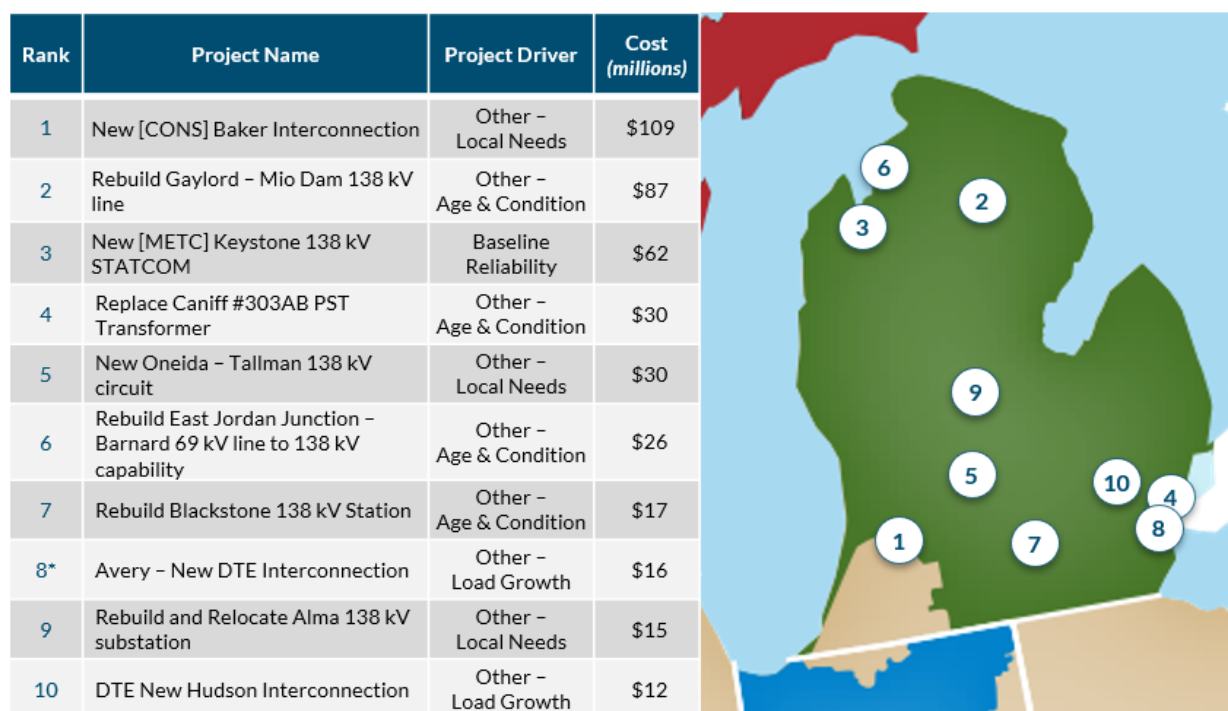


Figure 4.4-2: East region top ten projects by cost; * represents project studied through Expedited Project Review (EPR) process (as of 8-28-2025).



4.4.1 ITC Transmission (ITCT)

ITC
MTEP25 Summary

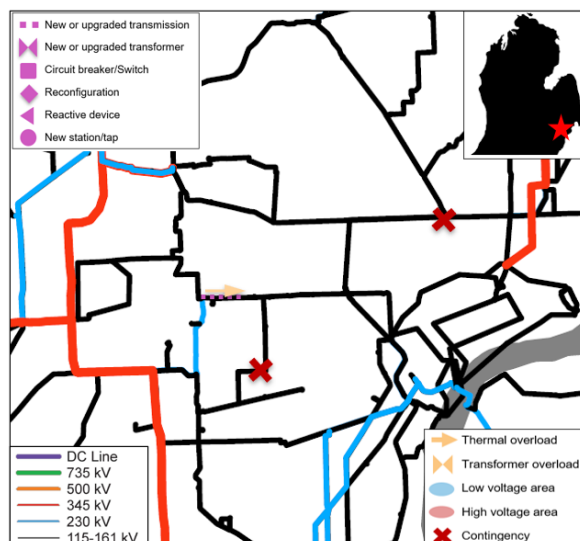
11
Total Projects

\$134M
Investment



Baseline Reliability Projects

18192 – Rebuild Hines – Levan 120 kV Line



Submitting TO	ITC
Project #	18192
Project Name	Rebuild Hines - Levan 120 kV Line
Project Type	BRP
Project Description	Rebuild the 954 ACSR sections (~0.5 mile) from structure #5680A to Levan and from structure #5686 to Hines with 1431 ACSR using 120 kV, double-circuit construction. Install OPGW on the rebuilt sections. Also, upgrade the 954 ACSR bus (line drop) at Levan "HD" to at least 375 MVA for summer emergency rating. Terminate fiber at both ends.
System Need	The Hines - Levan circuit is projected to become overloaded in MISO's MTEP24 study.
Current Cost	\$2M
Expected ISD	6/1/2031
Target Appendix	A

Figure 4.4.1-1: P18192 Geographic transmission map of project area and MTEP Portal project details.

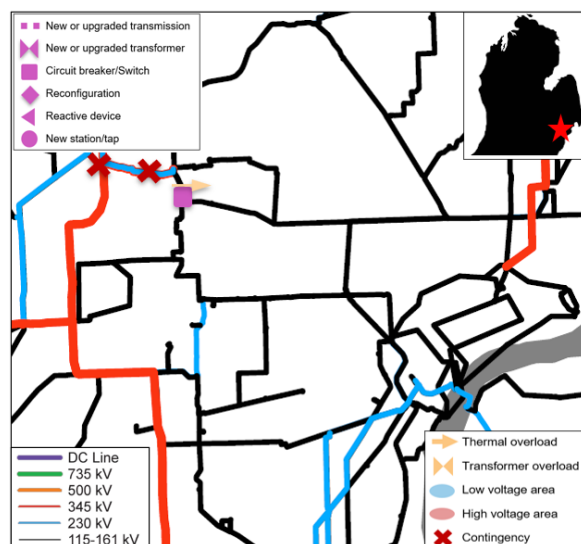


Project Justification: The [ITCT] Levan—[ITCT] Hines 120 kV line is overloaded in the 2027 and 2030 year models for P6 outages. No redispatch has been found for these overloads. A transitional rating has been found which serves as near-term mitigation for this project.

Cont. Type	Limiting Element	Pre-Project (post-cont.) Loading (%)	Post-Project (post-cont.) Loading (%)
P6	[ITCT] Levan—[ITCT] Hines 120 kV line	103	81

Table 4.4.1-1: P18192 Thermal loading drivers.

50590 – Upgrade Sunset 120 kV Switch



Submitting TO	ITC
Project #	50590
Project Name	Upgrade Sunset 120 kV Switch
Project Type	BRP
Project Description	Upgrade the 1200A switch "HI" at Sunset 120 kV station.
System Need	MISO identified the overload on Sunset2-Sunset3 120kV bus-tie (HH) in the MTEP24 study.
Current Cost	\$0.4M
Expected ISD	6/1/2030
Target Appendix	A

Figure 4.4.1-2: P50590 Geographic transmission map of project area and MTEP Portal project details.

Project Justification: The [ITCT] Sunset—[ITCT] Sunset 120 kV line (Z1) is overloaded in the 2027 and 2030 year models for P6 outages. No redispatch has been found for these overloads. A system reconfiguration has been found which serves as near-term mitigation for this project.

Cont. Type	Limiting Element	Pre-Project (post-cont.) Loading (%)	Post-Project (post-cont.) Loading (%)
P6	[ITCT] Sunset—[ITCT] Sunset Z1 120 kV line	105	65

Table 4.4.1-2: P50590 Thermal loading drivers.



50591 – Install Phoenix 120 kV Capacitor

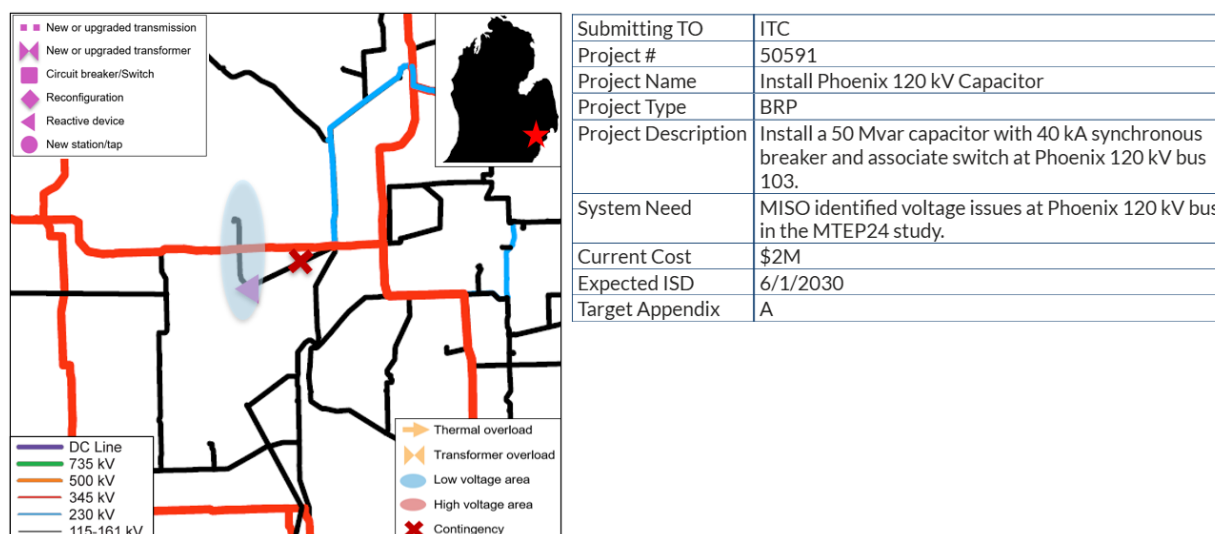


Figure 4.4.1-3: P50591 Geographic transmission map of project area and MTEP Portal project details.

Project Justification: Low voltages are found at the Phoenix 120 kV substation and nearby buses in 2027, 2030, and 2035 models for N-1 contingencies. The near-term mitigation for this project is to maximize use of existing capacitors.

Cont. Type	Limiting Element	Voltage Threshold (pu)	Pre-Project (post-cont.) Voltage (pu)	Post-Project (post-cont.) Voltage (pu)
P2	[ITCT] Phoenix substation [ITCT] Apex substation	0.92	0.897	0.966

Table 4.4.1-3: P50591 Voltage loading drivers.

Other Projects

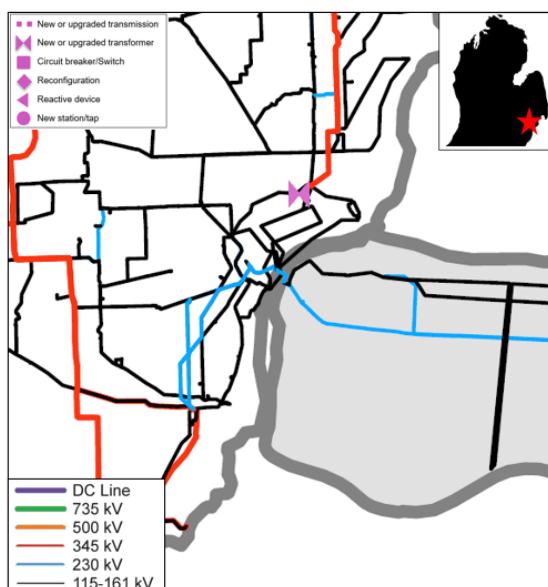
Project ID	Project Name	Other Breakdown	ISD	Estimated Cost (\$M)
*50212	Avery - New DTE Interconnection	Load Growth	9/30/2027	\$15.8
50246	Replace Caniff #303AB PST Transformer	Age and Condition	12/31/2028	\$30.0
50253	Oliver - New DTE Interconnection	Local Reliability	12/1/2027	\$5.6
50468	ITCT Customer Interconnections - 2028	Load Growth	12/31/2028	\$2.5
50476	ITCT Line Relocation - 2026	Local Needs	12/31/2026	\$2.5
50477	ITCT Line Relocation - 2027	Local Needs	12/31/2027	\$2.5
50479	ITCT Asset Replacement Program - 2027	Age and Condition	12/31/2027	\$59.8



Project ID	Project Name	Other Breakdown	ISD	Estimated Cost (\$M)
50597	DTE New Hudson Interconnection	Load Growth	3/31/2028	\$12.2

* Project studied through Expedited Project Review (EPR) process.

50246 – Replace Caniff #303AB PST Transformer



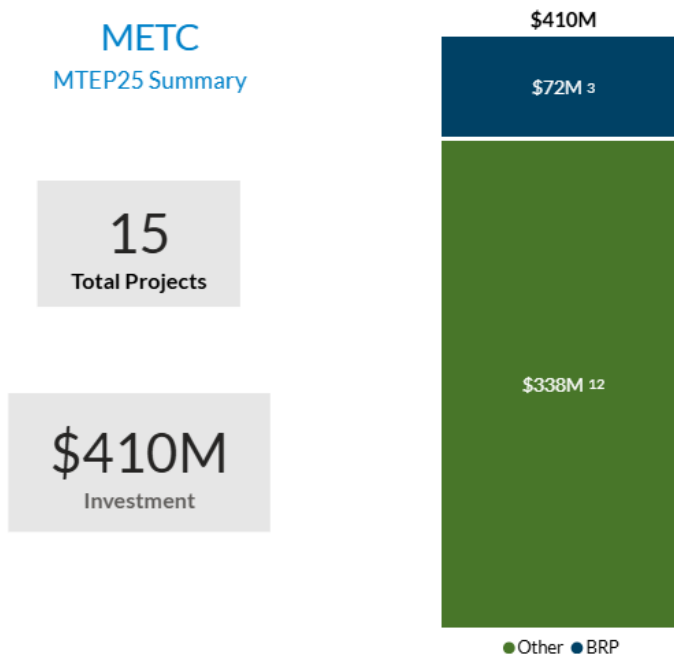
Submitting TO	ITC
Project #	50246
Project Name	Replace Caniff #303AB PST Transformer
Project Type	Other
Project Description	Replace the Caniff #303(AB) PST Transformer with at least 736 MVA (3543 Amps) summer emergency rated transformer. Phase-shift angle of +/- 15°. Install a breaker and associated equipment on the high side of the transformer.
System Need	The Caniff #303(AB) PST Transformer is reaching end of life and has been identified for replacement due to age and condition.
Current Cost	\$30M
Expected ISD	12/31/2028
Target Appendix	A

Figure 4.4.1-5: P50246 Geographic transmission map of project area and MTEP Portal project details.

MISO's no harm analysis reported no new or worsened system conditions due to implementation of this project.



4.4.2 Michigan Electric Transmission Co. (METC)



Baseline Reliability Projects

15993 – New [METC] Keystone 138 kV STATCOM

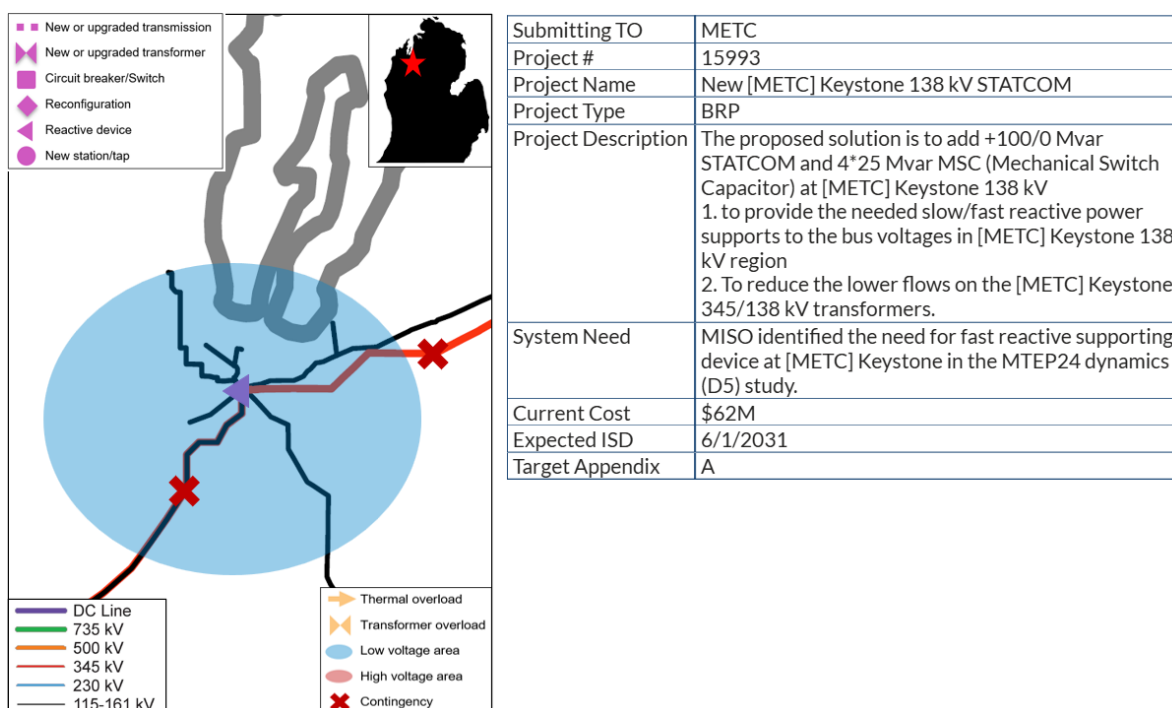
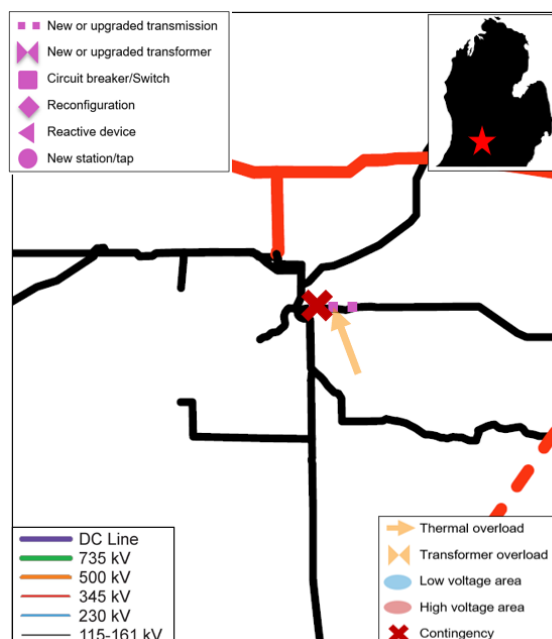


Figure 4.4.2-1: P15993 Geographic transmission map of project area and MTEP Portal project details.



Project Justification: The driver for this project is from the MTEP24 D5 Dynamic Analysis Study. For nearby P6 events, redispatch could not be found after first event. Additionally, many low voltages were seen on 138 kV buses for up to five seconds after the second event (not enough time for load shed).

50366 – Upgrade Mud Lake – Verona #1 138 kV line



Submitting TO	METC
Project #	50366
Project Name	Upgrade Mud Lake - Verona #1 138 kV line
Project Type	BRP
Project Description	Upgrade ~0.67 mile of 954 ACSR to 1431 ACSR on the Mud Lake – Verona 138 kV line No. 1. Also, upgrade the 2-4/0 Cu stranded bus at position "588" and switch 585 to at least 450 MVA for summer emergency rating.
System Need	MISO's MTEP24 generator deliverability study shows the Mud Lake - Verona 138 kV line No. 1 overloaded for an N-1 contingency.
Current Cost	\$2M
Expected ISD	6/1/2030
Target Appendix	A

Figure 4.4.2-2: P50366 Geographic transmission map of project area and MTEP Portal project details.

Project Justification: This project is driven by the MTEP24 Generation Deliverability (D6) study.

Cont. Type	Limiting Element	Pre-Project (post-cont.) Loading (%)	Post-Project (post-cont.) Loading (%)
P1	[METC] Verona – [METC] Mud Lake 1 138 kV line	114	79

Table 4.4.2-1: P50366 Thermal loading drivers.



50372 – Upgrade Dupont-White Lake 138 kV line

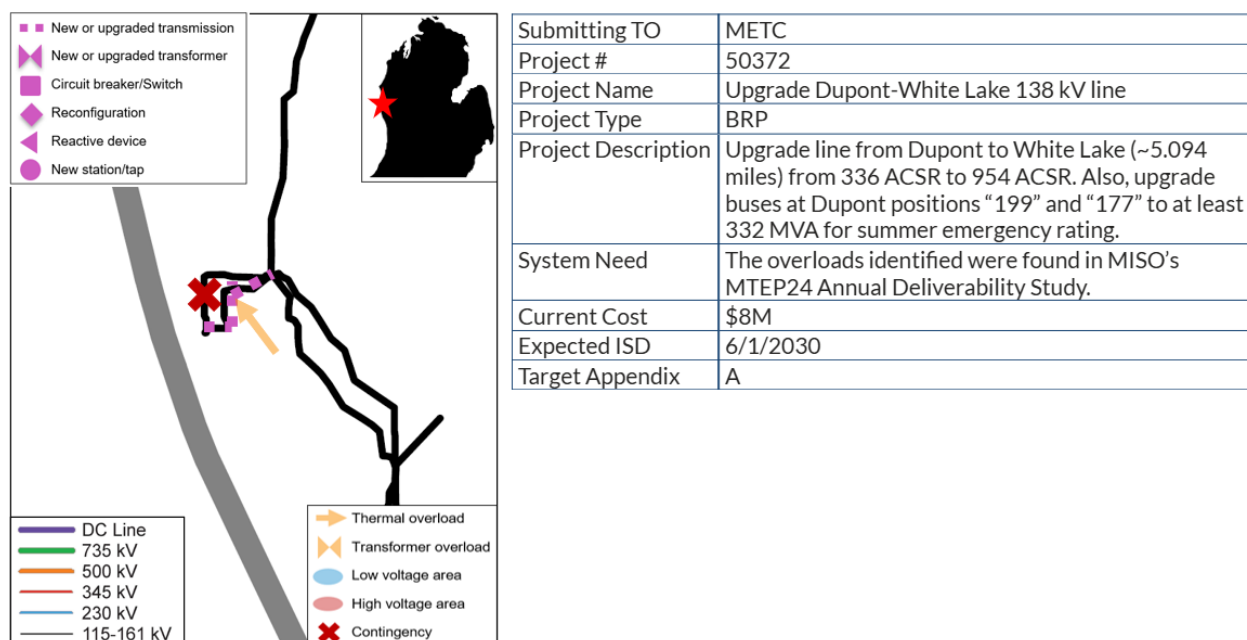


Figure 4.4.2-3: P50372 Geographic transmission map of project area and MTEP Portal project details.

Project Justification: This project is driven by the MTEP24 Generation Deliverability (D6) study.

Cont. Type	Limiting Element	Pre-Project (post-cont.) Loading (%)	Post-Project (post-cont.) Loading (%)
P1	[METC] Dupont – [METC] White Lake 138 kV line	122	60

Table 4.4.2-2: P50372 Thermal loading drivers.

Other Projects

Project ID	Project Name	Other Breakdown	ISD	Estimated Cost (\$M)
20020	Rebuild Gaylord - Mio Dam 138 kV line	Age and Condition	12/31/2029	\$87.3
50203	Rebuild and Relocate Alma 138 kV substation	Local Needs	12/31/2029	\$15.2
50229	New Oneida - Tallman 138 kV circuit	Local Needs	12/31/2029	\$29.6
50251	Rebuild Batavia - Dorrance #1 & #2 138 kV lines	Age and Condition	12/31/2029	\$10.6
50317	New Hagensville Junction Interconnection (METC)	Load Growth	12/31/2028	\$5.0
50377	Rebuild Blackstone 138 kV Station	Age and Condition	6/1/2030	\$17.0
50447	New [CONS] Baker Interconnection	Local Needs	6/1/2030	\$108.8



Project ID	Project Name	Other Breakdown	ISD	Estimated Cost (\$M)
50463	Rebuild [CONS] Blackstone 46 kV Station	Local Needs	10/1/2028	\$3.3
50466	METC Customer Interconnections - 2028	Load Growth	12/31/2028	\$2.5
50474	METC Line Relocation - 2026	Local Needs	12/31/2026	\$2.5
50475	METC Line Relocation - 2027	Local Needs	12/31/2027	\$2.5
50478	METC Asset Replacement Program - 2027	Age and Condition	12/31/2027	\$53.9

20020 – Rebuild Gaylord - Mio Dam 138 kV line

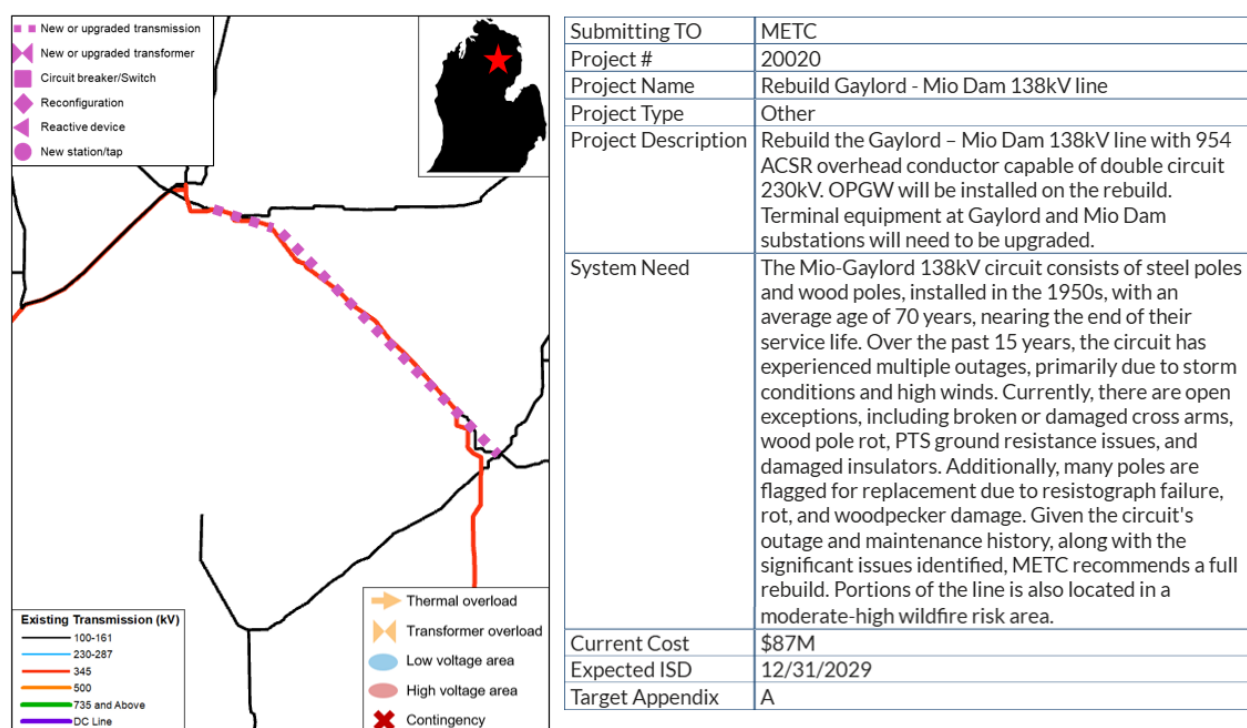
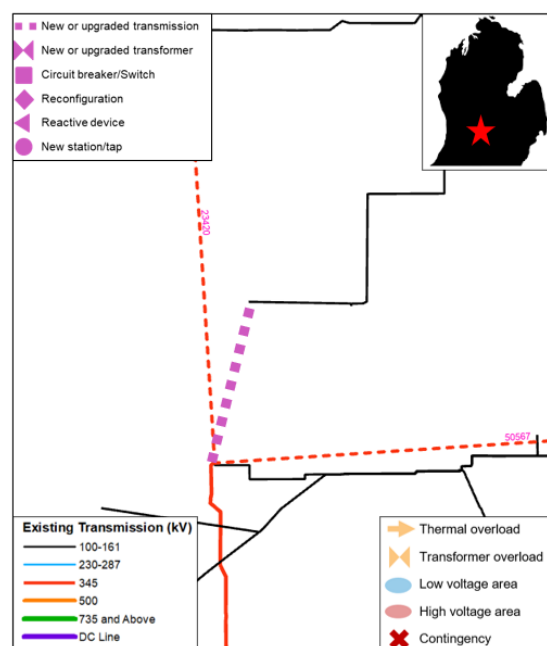


Figure 4.4.2-4: P20020 Geographic transmission map of project area and MTEP Portal project details.

MISO's no harm analysis reported no new or worsened system conditions due to implementation of this project.



50229 – New Oneida - Tallman 138 kV circuit



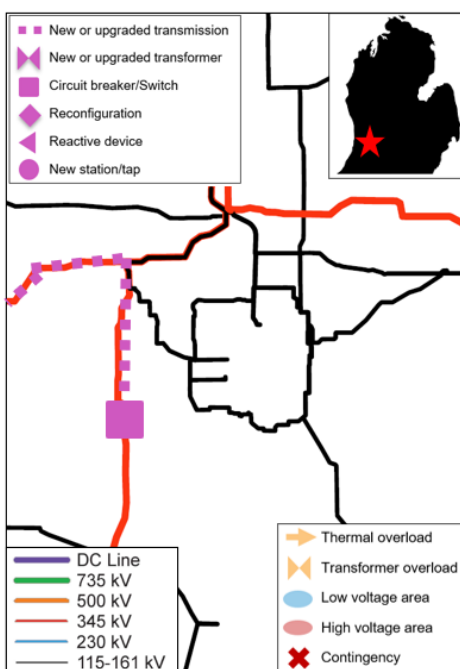
Submitting TO	METC
Project #	50229
Project Name	New Oneida - Tallman 138 kV circuit
Project Type	Other
Project Description	Build new Oneida – Tallman 138 kV circuit utilizing 1431 ACSR and double circuit structures capable of OPGW. Use 9.5 miles METC existing easement and obtaining new 0.5 miles ROW to connect this corridor to Tallman. Install two one-way 3000A PTS at Tallman. Install new 138 kV breaker capable of 40 kA interrupting and complete an existing row at Oneida 138 kV station. Install new 138 kV three breaker ring bus station at Looking Glass.
System Need	The Bingham 138 kV substation only has two sources supporting a weak area of the 46 kV system. This restricts the ability to maintain the lines and station equipment at Bingham. Additionally, the Bingham – Looking Glass circuit is 25 miles long which feeds a similar area on the 46kV system. Outages on this circuit for any extended period are a concern for Consumers Energy and its customers. Running a circuit from Oneida to Tallman would not only support the immediate area but also provide relief for West – East flows during outages in this area. With the outage restrictions on the Bingham-Looking Glass line, it is not possible to rebuild the Bingham-Looking Glass line with typical construction methods. The Oneida-Tallman line would mitigate the outage constraints allowing for future maintenance to be completed without abnormal construction methods or undue impacts to the operations of the area.
Current Cost	\$30M
Expected ISD	12/31/2029
Target Appendix	A

Figure 4.4.2-5: P50229 Geographic transmission map of project area and MTEP Portal project details.

MISO's no harm analysis reported no new or worsened system conditions due to implementation of this project.



50447 – New [CONS] Baker Interconnection



Submitting TO	METC
Project #	50447
Project Name	New [CONS] Baker Interconnection
Project Type	Other
Project Description	METC to install two 138 kV, 63kA breakers at Weeds Lake to terminate Consumers Energy's new Baker connection at position "BM8" and construct approximately 36.5 miles of new 138 kV line on double-circuit structures (leave vacant side for future use) using 954 ACSR conductor.
System Need	Consumers Energy requested to connect their new Baker 138/46kV substation to METC's Weeds Lake 138 kV station.
Current Cost	\$109M
Expected ISD	6/1/2030
Target Appendix	A

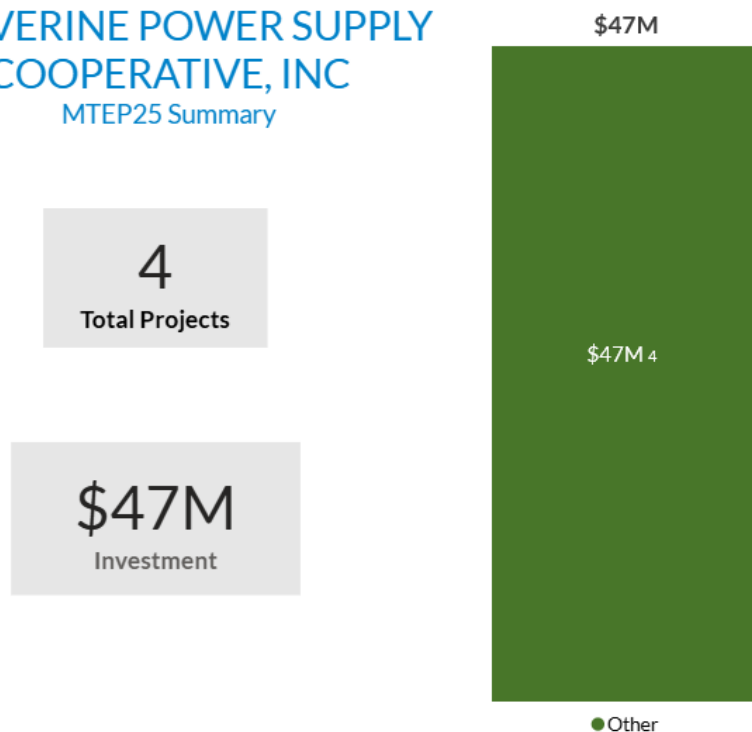
Figure 4.4.2-6: P50447 Geographic transmission map of project area and MTEP Portal project details.

MISO's no harm analysis reported no new or worsened system conditions due to implementation of this project.



4.4.3 Wolverine Power Supply Cooperative Inc. (WPSC)

WOLVERINE POWER SUPPLY COOPERATIVE, INC MTEP25 Summary



Other Projects

Project ID	Project Name	Other Breakdown	ISD	Estimated Cost (\$M)
50337	Rebuild Tower - Black Lake 69 kV line to 138 kV capability	Age and Condition	12/31/2029	\$4.5
50338	Rebuild Lincoln Junction - Lincoln 69 kV line to 138 kV capability	Age and Condition	12/31/2029	\$5.0
50339	Rebuild Bass Lake - Wolf Lake 69 kV line to 138 kV capability	Age and Condition	12/31/2029	\$11.0
50401	Rebuild East Jordan Junction - Barnard 69 kV line to 138 kV capability	Age and Condition	12/31/2029	\$26.0

4.4.4 Michigan Public Power Agency (MPPA)

Michigan Public Power Agency and MISO are not recommending any new projects for MTEP25.

4.4.5 Lansing Board of Water and Light (LBWL)

Lansing Board of Water and Light and MISO are not recommending any new projects for MTEP25.



4.4.6 Michigan South Central Power Agency (MSCPA)

Michigan South Central Power Agency and MISO are not recommending any new projects for MTEP25.



4.5 Project Justifications – South Region

South Region Overview

The MISO South Planning Region consists of eleven Transmission-Owning members spanning four states, Arkansas, Louisiana, Mississippi, and parts of Texas. These Transmission Owners are:

Arkansas Electric Cooperative Corporation (AECC)	Entergy Louisiana LLC (ELL)
City of Alexandria (AXLA)	Entergy Mississippi LLC (EML)
CLECO Power LLC (CLEC)	Entergy Texas Incorporated (ETI)
Cooperative Energy (SMEPA)	Lafayette Utilities Systems (LAFA)
East Texas Electric Cooperative (ETEC)	City Water and Light Jonesboro (CWLT)
Entergy Arkansas LLC (EAL)	

The region contains approximately 17,800 circuit miles of transmission lines ranging from 115 kV to 500 kV. There is also a significant 69 kV sub-transmission network interspersed across the footprint.

In the 2024 series of planning models, the south region contains more than 54.7 GW of generation. The MISO South generation profile consists of mostly combined cycle, nuclear, gas, coal fuel types, and solar serving major load centers such as Little Rock, New Orleans, etc. Approximately 40% (21.9 GW) of the South region's generation capacity is made up of combined cycle (CC) units. Major generation centers are in central Arkansas, lower Louisiana, and western Mississippi (Figure 4.5-1).

Major load centers are typically found around larger cities in the region such as Little Rock, Jonesboro, and Pine Bluff in Arkansas; Monroe, Alexandria, Lake Charles, Lafayette, New Orleans, and Baton Rouge in Louisiana; Jackson, Hattiesburg, Natchez, Vicksburg, and Greenville in Mississippi. Texas major load centers in the Western load pocket include Bryan and The Woodlands area. The major load center in the West of the Atchafalaya Basin (WOTAB) load pocket portion of Texas is in South Beaumont and the Port Arthur Area (Figure 4.5-1). According to the 2026 Summer Peak planning model, the regional load is over 39.8 GW.

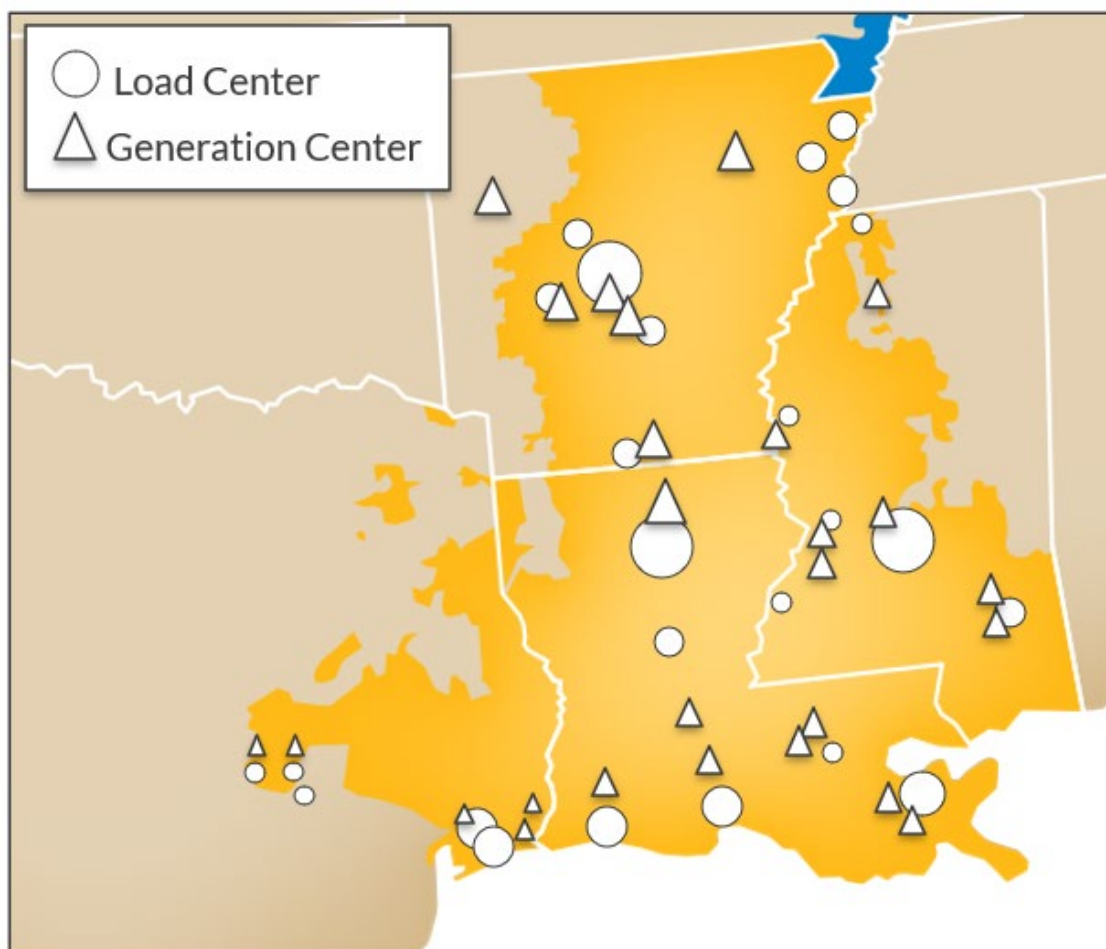
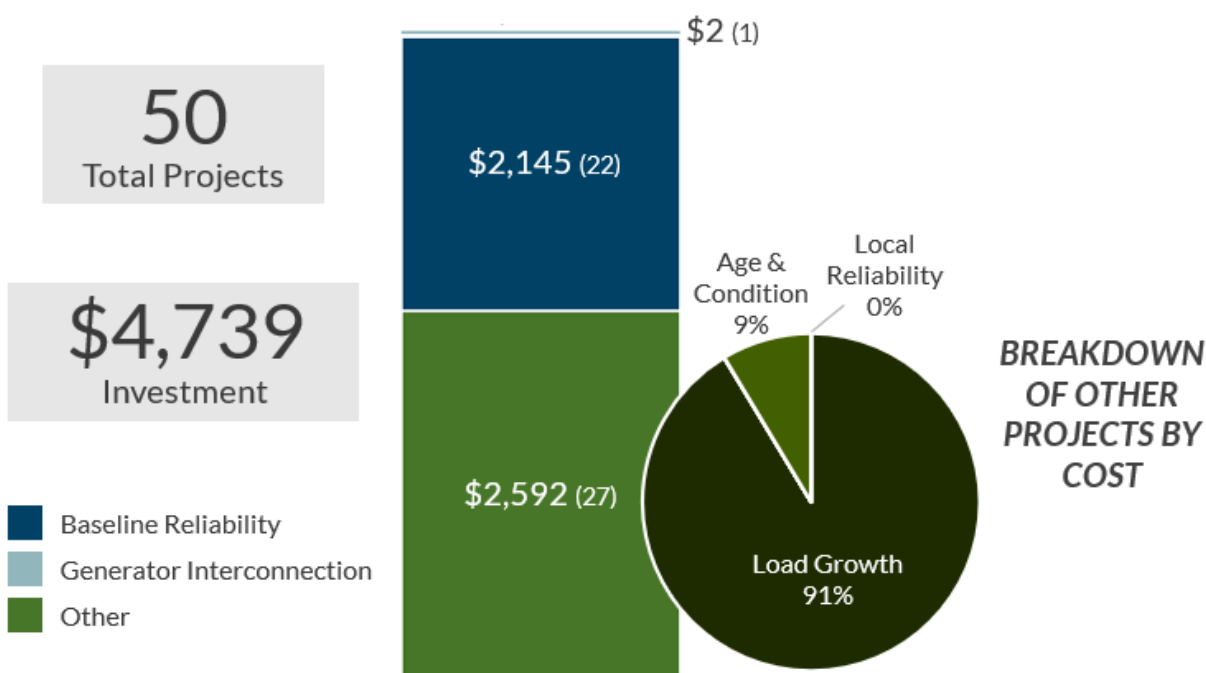


Figure 4.5-1: Generation and load centers in the South planning region.



South Planning Region Local MTEP25 Summary

(Data as of August 28, 2025; \$M, # project count)



SOUTH REGION HIGHLIGHTS

Transmission Miles

370 total line miles
91% new miles, 9% upgraded miles
Top states: Louisiana, Texas, Arkansas

Spot Load Additions (4.9 GW)

Top states: Louisiana and Mississippi

Expedited Project Reviews (EPRs)

14 approved (original + mitigating projects)
\$2.3 billion investment
Top states: Louisiana, Texas, Arkansas

South Region Total Investment

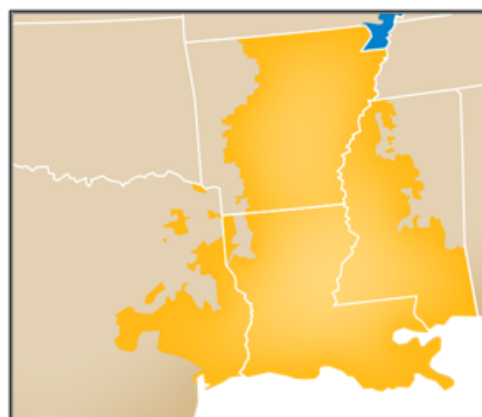
Top states: Louisiana, Mississippi, Texas

Other Projects:

Majority of Load Growth in Louisiana

Baseline Reliability Projects:

One project in Louisiana adds 145 new miles of 500 kV





The ten largest project investments in the MISO South region represent an estimated \$3.9 billion (83%) of the \$4.7 billion total recommended projects for the South region, or 31% of the \$12.4 billion total recommended in the MISO footprint. The locations of these projects are shown in Figure 4.5-2. Projects that are blanket expenditures (relays, physical security, etc.) are excluded from this list.

South Region Top 10 MTEP25 Projects

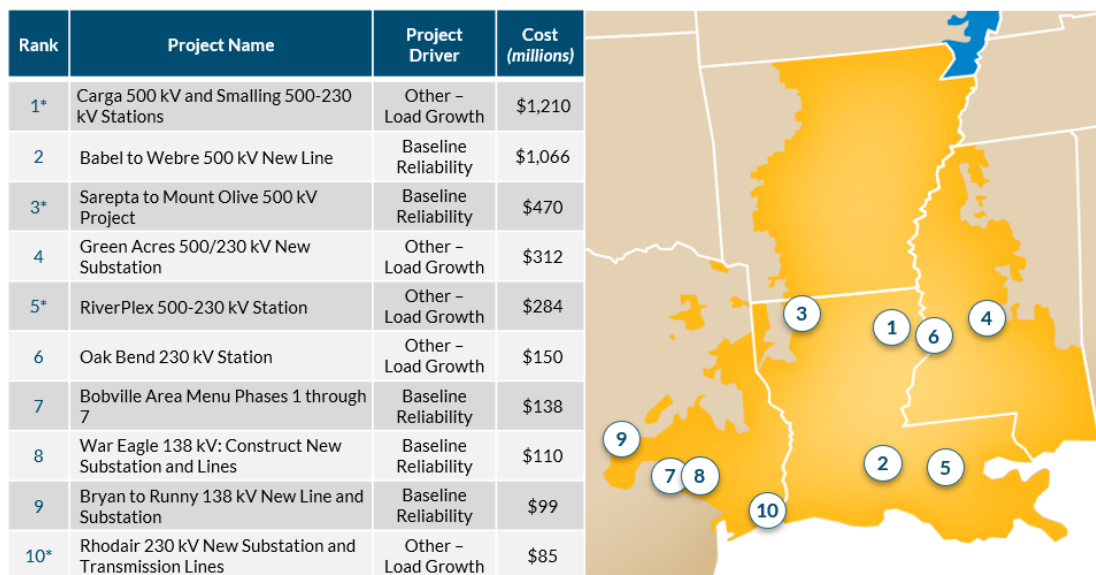


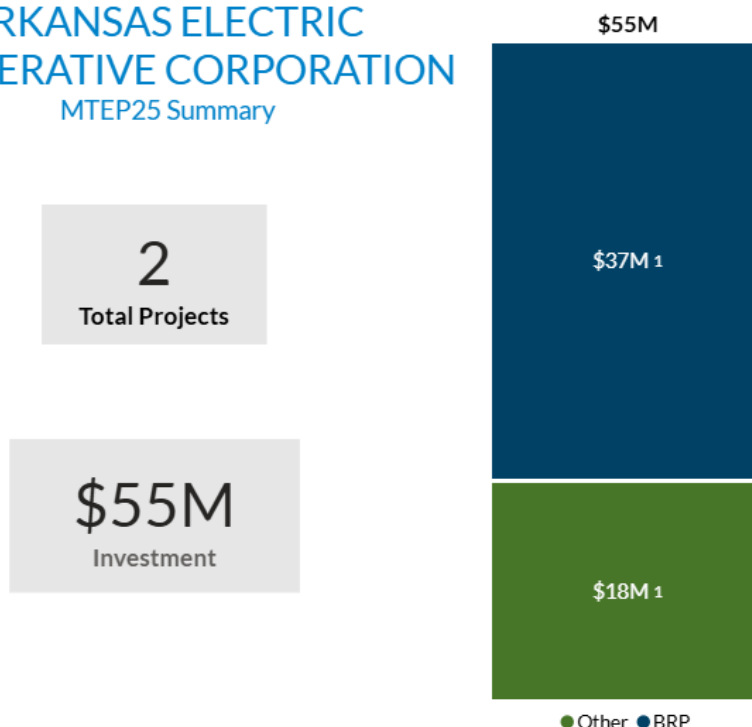
Figure 4.5-2: South region top ten projects by cost; * represents project studied through Expedited Project Review (EPR) process (data as of 8-28-2025).



4.5.1 Arkansas Electric Cooperative Corporation (AECC)

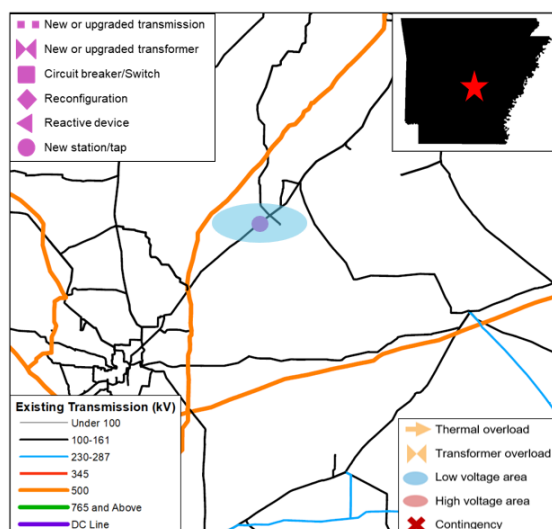
ARKANSAS ELECTRIC COOPERATIVE CORPORATION

MTEP25 Summary



Baseline Reliability Projects

50191 – Beebe North 115 kV SS – Nelson 115 kV SS



Submitting TO	ARKANSAS ELECTRIC COOPERATIVE CORPORATION
Project #	50191
Project Name	Beebe North 115kV SS - Nelson 115kV SS
Project Type	BRP
Project Description	AECC will construct a new Beebe North 115kV switching station on EAI's Beebe to Garner 115kV transmission line. This new switching station will tap the Beebe to Garner line approximately 2 miles north of EAI's Beebe station. AECC will also construct a new, approximately 7-mile long, 115kV transmission line from the new Beebe North 115kV SS to a new Sylvania 115kV substation. Additionally, AECC will construct another new, approximately 7-mile long, 115kV transmission line from the new Sylvania station to a new Nelson 115kV switching station. The new Nelson 115 kV SS will tie into the Member Coop's existing 115kV system.
System Need	This project is needed to support voltage and improve the reliability of the Member Coop's system caused by normal load growth in the area.
Current Cost	\$37M
Expected ISD	9/1/2028
Target Appendix	A

Figure 4.5.1-1: P50191 Geographic transmission map of project area and MTEP Portal project details.



Project Justification: Load Growth in the area leads to low voltage issues without the new 115kV loop and a NERC defined P1 contingency.

Cont. Type	Limiting Element	Voltage Threshold (pu)	Pre-Project (post-cont.) Voltage (pu)	Post-Project (post-cont.) Voltage (pu)
P1	Mt. Carmel 115 kV Bus	0.95	0.9196	1.0148
P1	Nelson 115 kV Bus	0.95	0.9218	1.0091
P1	Nelson SS 115 kV Bus	0.95	0.9218	1.0095
P1	Sylvania 115 kV Bus	0.95	0.9205	1.0144
P1	Cabot S 115 kV Bus	0.95	0.9316	0.9917
P1	Furlow 115 kV Bus	0.95	0.9423	0.9824

Table 4.5.1-1: P50191 Voltage loading drivers.

Other Projects

Project ID	Project Name	Other Breakdown	ISD	Estimated Cost (\$M)
*50594	Helena Harbor Load Addition	Load Growth	12/1/2026	\$18.2

* Project studied through Expedited Project Review (EPR) process.

4.5.2 City of Alexandria (AXLA)

City of Alexandria and MISO are not recommending any new projects for MTEP25.

4.5.3 CLECO Power LLC (CLEC)

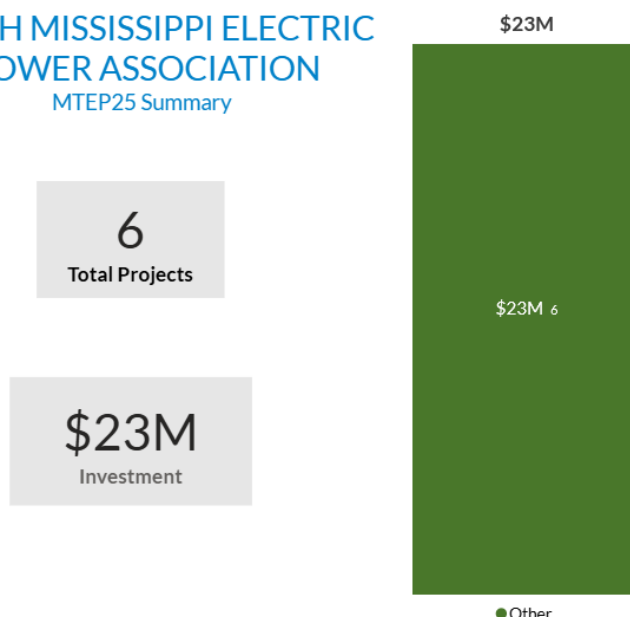
Cleco and MISO are not recommending any new projects for MTEP25.



4.5.4 Cooperative Energy (formerly SMEPA)

SOUTH MISSISSIPPI ELECTRIC POWER ASSOCIATION

MTEP25 Summary



Other Projects

Project ID	Project Name	Other Breakdown	ISD	Estimated Cost (\$M)
25502	Line 4B Rebuild	Age and Condition	3/1/2027	\$10.4
25541	Line 5 Rebuild	Age and Condition	4/1/2026	\$6.1
50391	Line 74B Rebuild	Age and Condition	1/1/2027	\$0.9
50399	Line 35A Rebuild	Local Reliability	6/1/2028	\$0.9
50400	Ovett 69 kV Delivery Point	Load Growth	10/1/2026	\$2.1
50404	Lake Walthall 115 kV Delivery Point	Load Growth	12/1/2026	\$2.8

4.5.5 East Texas Electric Cooperative (ETEC)

East Texas Electric Cooperative and MISO are not recommending any new projects for MTEP25.



4.5.6 Entergy Arkansas LLC (EAL)

ENTERGY ARKANSAS, LLC

MTEP25 Summary

10

Total Projects

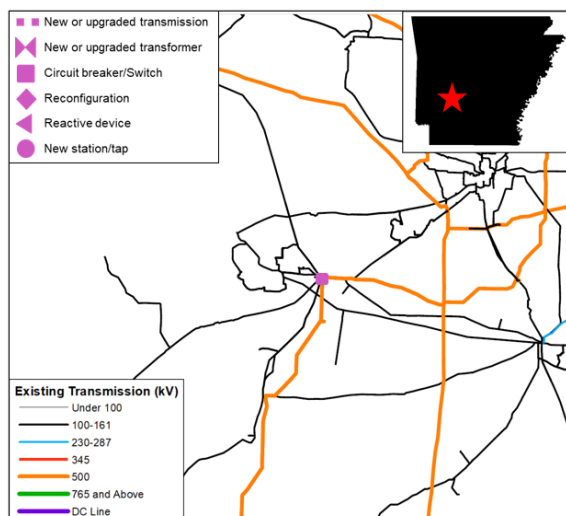
\$149M

Investment



Baseline Reliability Projects

50384 – Hot Springs 500 kV SPOF

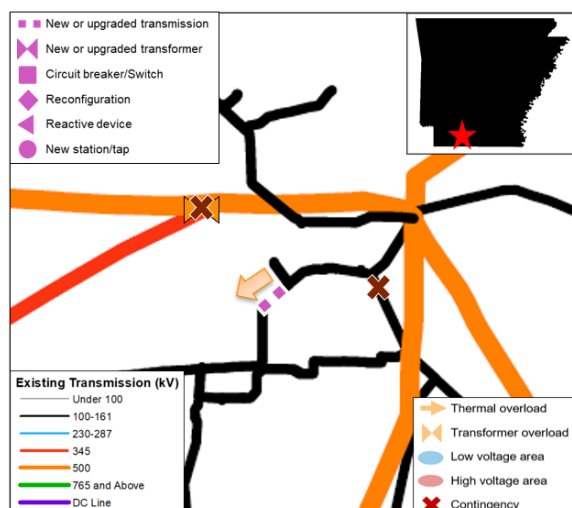


Submitting TO	ENTERGY ARKANSAS, LLC
Project #	50384
Project Name	Hot Springs 500kV SPOF
Project Type	BRP
Project Description	All 500kV line panels at Hot Springs EHV will have primary 1 relays on a separate DC panel than primary 2/backup relays. The breakers for these lines will have trip coil #1 and trip coil #2 fed from separate DC panels. The DC panels will be fed from separate battery sets.
System Need	The Hot Spring, Magnet Cove, Rammel, Carpenter, Blakely, and Degray Dam generation go unstable for a SLG fault on Hot Springs-Etta 500kV or Hot Springs-Magnet Cove 500kV lines with non-redundant protection system component failure.
Current Cost	\$1M
Expected ISD	12/1/2026
Target Appendix	A

Figure 4.5.6-1: P50384 Geographic transmission map of project area and MTEP Portal project details.



50385 – El Dorado Donan - El Dorado Monsanto 115 kV: Rebuild Line



Submitting TO	ENTERGY ARKANSAS, LLC
Project #	50385
Project Name	El Dorado Donan - El Dorado Monsanto 115 kV: Rebuild Line
Project Type	BRP
Project Description	Rebuild the ~3.1 mile line segment along with any other station equipment to achieve a 1300 A flow-through rating.
System Need	The Donan - Monsanto transmission line overloads for the loss of J1612 generation & El Dorado EHV – El Dorado E 115kV line. [NERC TPL-001 P3]
Current Cost	\$8M
Expected ISD	6/30/2027
Target Appendix	A

Figure 4.5.6-2: P50385 Geographic transmission map of project area and MTEP Portal project details.

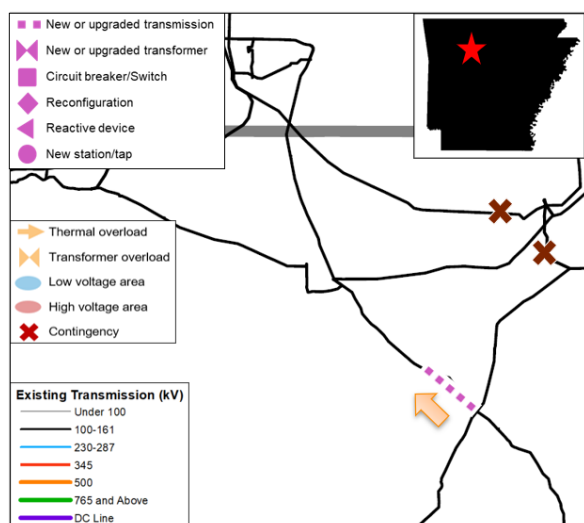
Project Justification: Multiple NERC Defined P6 Contingencies cause overloads on the El Dorado Donan to El Dorado Monsanto 115 kV Line.

Cont. Type	Limiting Element	Pre-Project (post-cont.) Loading (%)	Post-Project (post-cont.) Loading (%)
P6	El Dorado Donan – El Dorado Monsanto 115 kV	124	93
P6	El Dorado Donan – El Dorado Monsanto 115 kV	118	97
P6	El Dorado Donan – El Dorado Monsanto 115 kV	115	91
P6	El Dorado Donan – El Dorado Monsanto 115 kV	112	91

Table 4.5.6-1: P50385 Thermal loading drivers.



50386 – Hilltop - Saint Joe 161 kV: Rebuild Line



Submitting TO	ENTERGY ARKANSAS, LLC
Project #	50386
Project Name	Hilltop - Saint Joe 161kV: Rebuild Line
Project Type	BRP
Project Description	Rebuild Hilltop – St Joe along with any other station equipment to achieve a 1300 A through path rating.
System Need	Compliance with NERC Reliability Standard TPL-001, R2.7. Increased reliability by updating aging infrastructure and increased line capacity for improved transmission system performance.
Current Cost	\$12M
Expected ISD	6/30/2027
Target Appendix	A

Figure 4.5.6-3: P50386 Geographic transmission map of project area and MTEP Portal project details.

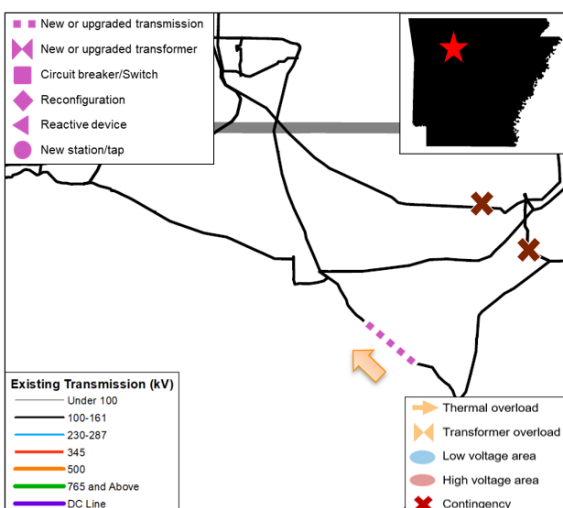
Project Justification: Hilltop to Saint Joe Thermal overload experienced for multiple NERC Defined P1 contingencies.

Cont. Type	Limiting Element	Pre-Project (post-cont.) Loading (%)	Post-Project (post-cont.) Loading (%)
P1	Hilltop – Saint Joe 161 kV	127	78
P1	Hilltop – Saint Joe 161 kV	119	73
P1	Hilltop – Saint Joe 161 kV	117	72

Table 4.5.6-2: P50386 Thermal loading drivers.



50387 – Saint Joe - Everton Road 161 kV: Rebuild Line



Submitting TO	ENTERGY ARKANSAS, LLC
Project #	50387
Project Name	Saint Joe - Everton Road 161kV: Rebuild Line
Project Type	BRP
Project Description	Rebuild St Joe – Everton Rd along with any other station equipment to achieve a 1300 A through path rating.
System Need	The St Joe – Everton Rd transmission line overloads for the bus failure at Table Rock 161 kV. [NERC TPL-001 P2.2]
Current Cost	\$30M
Expected ISD	12/30/2029
Target Appendix	A

Figure 4.5.6-4: P50387 Geographic transmission map of project area and MTEP Portal project details.

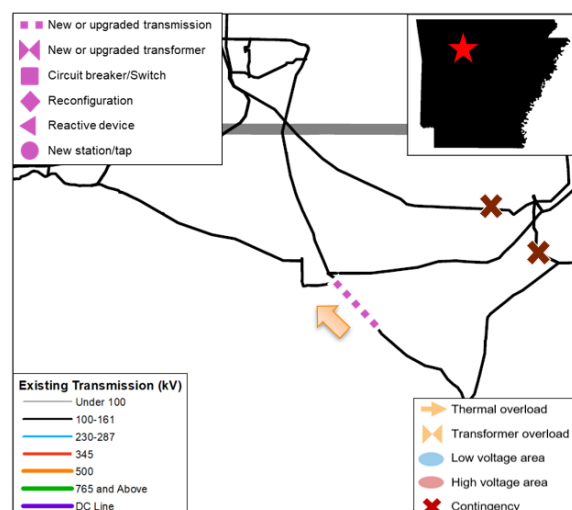
Project Justification: Saint Joe to Everton Rd Thermal overload experienced for multiple NERC Defined P2 contingencies.

Cont. Type	Limiting Element	Pre-Project (post-cont.) Loading (%)	Post-Project (post-cont.) Loading (%)
P2.2	Saint Joe – Everton Road 161 kV	126	77
P2.1	Saint Joe – Everton Road 161 kV	118	73
P2.1	Saint Joe – Everton Road 161 kV	117	72

Table 4.5.6-3: P50387 Thermal loading drivers.



50388 – Everton Road - Harrison East 161 kV: Rebuild Line



Submitting TO	ENTERGY ARKANSAS, LLC
Project #	50388
Project Name	Everton Road - Harrison East 161kV: Rebuild line
Project Type	BRP
Project Description	Rebuild Everton Rd – Harrison East along with any other station equipment to achieve a 1300 A through path rating.
System Need	Compliance with NERC Reliability Standard TPL-001, R2.7. Increased reliability by updating aging infrastructure and increased line capacity for improved transmission system performance.
Current Cost	\$20M
Expected ISD	6/30/2028
Target Appendix	A

Figure 4.5.6-5: P50388 Geographic transmission map of project area and MTEP Portal project details.

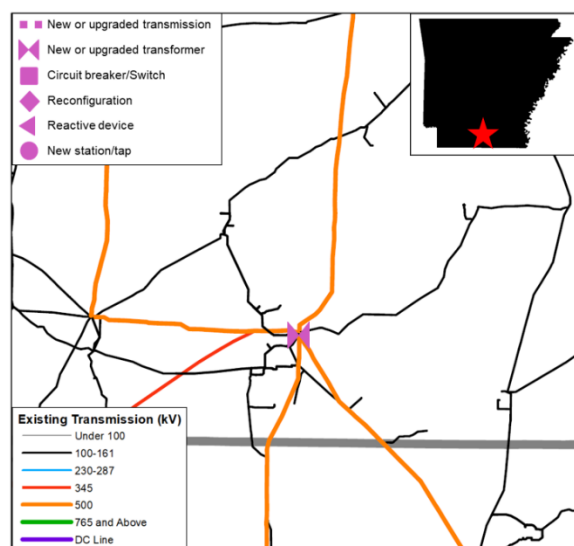
Project Justification: Everton Rd to Harrison East Thermal overload experienced for multiple NERC Defined P2 contingencies.

Cont. Type	Limiting Element	Pre-Project (post-cont.) Loading (%)	Post-Project (post-cont.) Loading (%)
P2.2	Everton Road – Harrison East 161 kV	123	76
P2.1	Everton Road – Harrison East 161 kV	116	71
P2.1	Everton Road – Harrison East 161 kV	123	70

Table 4.5.6-4: P50388 Thermal loading drivers.



50541 – El Dorado 500/345 kV Autotransformer Upgrade



Submitting TO	ENTERGY ARKANSAS, LLC
Project #	50541
Project Name	El Dorado 500/345kV Autotransformer Upgrade
Project Type	BRP
Project Description	EAL is proposing to upgrade the El Dorado 500/345kV Autotransformer including associated station equipment.
System Need	These facilities were identified as needed to maintain NERC compliance during Entergy's studies with the addition of the Mount Olive to Sarepta 500 kV project. This project is being submitted as an EPR due to the long lead time of Autotransformers and the timing of the submittal being after the September 2024 cutoff for inclusion into MTEP25.
Current Cost	\$36M
Expected ISD	12/1/2028
Target Appendix	A

Figure 4.5.6-6: P50541 Geographic transmission map of project area and MTEP Portal project details.

Project submitted through the Expedited Project Review (EPR) process and a reliability analysis confirmed this project mitigates violations resulting from the Cargas 500 kV and Smalling 500-230 kV Stations project (MTEP ID 50539). No additional issues were identified as a result of this project.

Other Projects

Project ID	Project Name	Other Breakdown	ISD	Estimated Cost (\$M)
50383	2026 EAL Asset Renewal Program	Age and Condition	12/30/2026	\$16.5
50441	Wrightsville 115 kV: Build two 115 kV lines	Load Growth	2/26/2027	\$17.8
*50581	Fort Mountain 161 kV: Build New Substation	Load Growth	3/31/2026	\$5.7

* Project studied through Expedited Project Review (EPR) process.

Generator Interconnection Projects

Project ID	Project Name	ISD	Estimated Cost (\$M)
50496	MPFCA Replace Sherwood 115 kV Breakers	10/31/2026	\$2.1



4.5.7 Entergy Louisiana LLC (ELL)

Entergy Louisiana

MTEP25 Summary

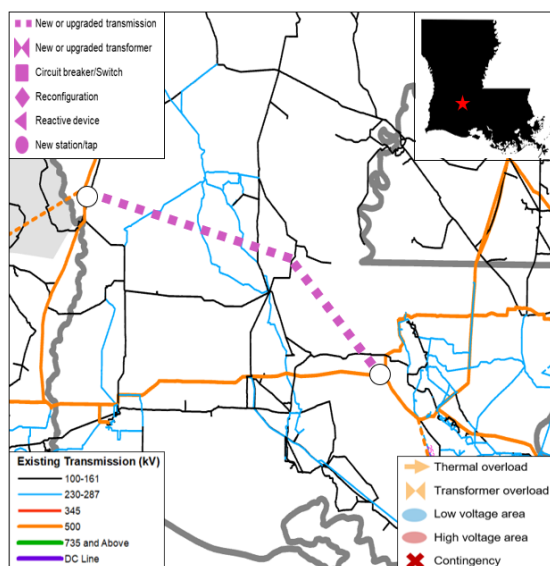
17
Total Projects

\$3,433M
Investment



Baseline Reliability Projects:

50350 – Babel to Webre 500 kV New Line



Submitting TO	ENTERGY SERVICES, LLC.
Project #	50350
Project Name	Babel to Webre 500 kV New Line
Project Type	BRP
Project Description	Construct a new ~145-mile 500 kV line from Babel to Webre 500 kV line.
System Need	Loss of the 500 kV path between Hartburg and Webre along with generation in South Louisiana overloads multiple facilities during high west to east or east to west transfers across the southern portion of Entergy's system. This project also increases the load serving capability for the Amite South region of the Entergy service territory which is critical to maintaining reliability while accommodating expected load growth. The project will also increase operational flexibility and enhance resiliency by creating a geographically diverse EHV transmission path which is especially important during extreme weather events.
Current Cost	\$1,066M
Expected ISD	6/1/2030
Target Appendix	A

Figure 4.5.7-1: P50350 Geographic transmission map of project area and MTEP Portal project details.

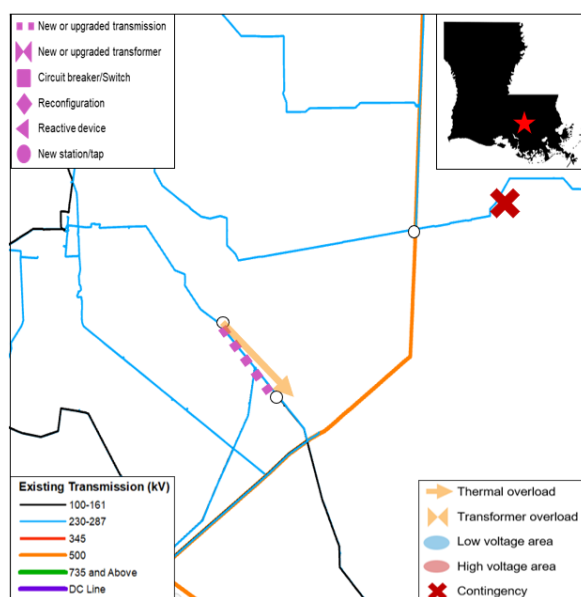


Project Justification: This line is needed to prevent thermal overloading on the underlying 138 kV system in the Lake Charles area as well as prevents ~26 individual line rebuilds ranging from 138 kV, 230 kV & 500 kV to make up for this line's need in the area.

Cont. Type	Limiting Element	Pre-Project (post-cont.) Loading (%)	Post-Project (post-cont.) Loading (%)
P6	West Fork – Wells 230 kV	131	<80
P6	Nelson – Lake Charles Bulk N 138 kV	113	<50
P6	Nelson – Lake Charles Bulk S 138 kV	112	<50
P6	Lake Charles Bulk S – Lowe Grout 138 kV	112	<35
P6	Richard – Bayou Cove 138 kV	111	<55

Table 4.5.7-1: P50350 Thermal loading drivers.

50357 – Harelson-Jones Creek Tap 69 kV Upgrades



Submitting TO	ENTERGY SERVICES, LLC.
Project #	50357
Project Name	Harelson-Jones Creek Tap 69kV Upgrades
Project Type	BRP
Project Description	Upgrade Harelson – Jones Creek Tap 69 kV line (~2.5 miles) and line bay riser
System Need	Entergy's Planning Guidelines and Criteria. P2.1 for the loss of Lockhart – Coly 69kV line overload Harelson – Jones Creek Tap 69 kV line.
Current Cost	\$15M
Expected ISD	6/1/2027
Target Appendix	A

Figure 4.5.7-2: P50357 Geographic transmission map of project area and MTEP Portal project details.

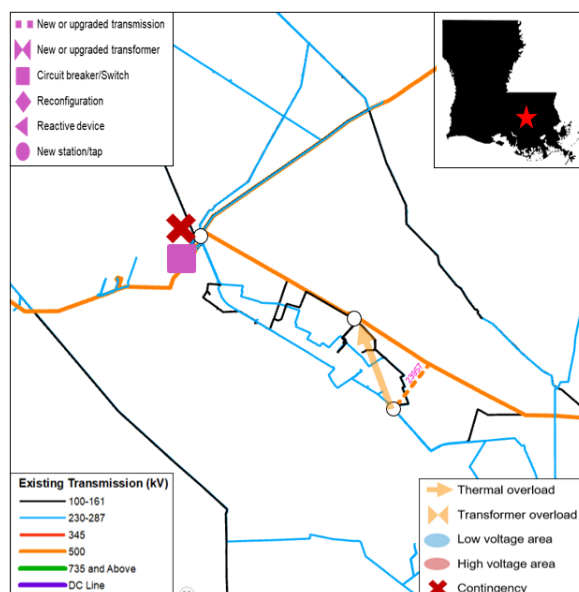
Project Justification: This project is necessary due to the loss of Lockhart – Coly 69 kV line overloading the Harelson – Jones Creek Tap 69 kV line.

Cont. Type	Limiting Element	Pre-Project (post-cont.) Loading (%)	Post-Project (post-cont.) Loading (%)
P21	Harelson – [EES] Jones Creek 69 kV line	106	50

Table 4.5.7-2: P50357 Thermal loading drivers.



50361 – Willow Glen 138 kV Bus SPOF



Submitting TO	ENTERGY SERVICES, LLC.
Project #	50361
Project Name	Willow Glen 138 kV Bus SPOF
Project Type	BRP
Project Description	Install a new battery bank at Willow Glen 138 kV station. The primary 1 relay needs to be on a separate DC panel than primary 2/backup relay. The breakers for the AT must have trip coil #1 and trip coil #2 fed from separate DC panels and the DC panels must be fed from separate battery sets. The DC panels cannot be wired in series or in parallel to one another.
System Need	NERC TPL-001 Reliability Standards and Entergy's Planning Guidelines. A P5 non-redundant bus differential relay failure of both Willow Glen 138 kV busses causes Conway-Ellem and Conway-Zephyr 138 kV lines to exceed their thermal ratings.
Current Cost	\$4M
Expected ISD	6/1/2026
Target Appendix	A

Figure 4.5.7-3: P50361 Geographic transmission map of project area and MTEP Portal project details.

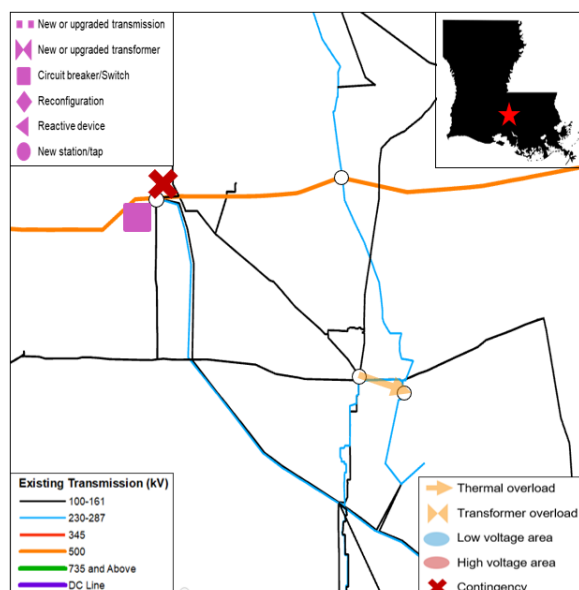
Project Justification: This project is necessary due to a NERC Defined P5 non-redundant bus differential relay failure causing the Conway-Ellem and Conway-Zephyr 138 kV lines to exceed their thermal ratings. Contingency has been eliminated, so thermal violation is no longer present.

Cont. Type	Limiting Element	Pre-Project (post-cont.) Loading (%)	Post-Project (post-cont.) Loading (%)
P5	[EES] Conway – [EES] Ellem 138 kV line	103	Contingency has been eliminated, so thermal violation is no longer present
P5	[EES] Conway – [EES] Zephyr 138 kV line	101	

Table 4.5.7-3: P50361 Thermal loading drivers.



50362 – Richard 500/138 kV Bus SPOF (Single Point of Failure)



Submitting TO	ENTERGY SERVICES, LLC.
Project #	50362
Project Name	Richard 500/138 kV Bus SPOF
Project Type	BRP
Project Description	All 138kV line panels need to have primary 1 relays on a separate DC panel than primary 2/backup relays. The DC panels must be fed from separate battery sets. The existing auto relays need to be investigated to ensure sufficient contacts for the trip coils to be redundant. Existing auto relays will need to be replaced if there are no sufficient contacts.
System Need	NERC TPL-001-5 and Entergy Local Planning Guidelines and Criteria. P5 Fault on the Richard 138 kV bus with delayed clearing overloads Scott to Bonin 138kV line.
Current Cost	\$9M
Expected ISD	6/1/2028
Target Appendix	A

Figure 4.5.7-4: P50362 Geographic transmission map of project area and MTEP Portal project details.

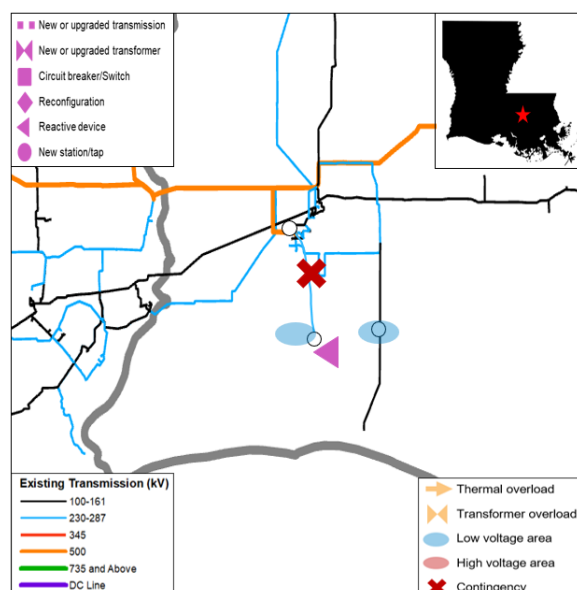
Project Justification: This project is necessary due to a NERC Defined P5 Fault with delayed clearing overloading the Scott to Bonin 138 kV line. Contingency has been eliminated, so thermal violation is no longer present.

Cont. Type	Limiting Element	Pre-Project (post-cont.) Loading (%)	Post-Project (post-cont.) Loading (%)
P5	EES] Scott – [EES] Bonin 138 kV line	110	Contingency has been eliminated, so thermal violation is no longer present

Table 4.5.7-4: P50362 Thermal loading drivers.



50363 – Little Prairie – Mud Lake Low Voltage Project



Submitting TO	ENTERGY SERVICES, LLC.
Project #	50363
Project Name	Little Prairie – Mud Lake Low Voltage Project
Project Type	BRP
Project Description	Install 223.90 MVAR reactive support (2-SVCs) at Little Prairie 230 kV station
System Need	NERC TPL-001 Reliability Standards and Entergy's Planning Guidelines. P6 contingency for the loss of Little Prairie – Big Lake 230 kV line and Little Prairie – Carlyss 230 kV line causes low voltage violations at Little Prairie and Mud Lake 230 kV stations.
Current Cost	\$54M
Expected ISD	10/31/2031
Target Appendix	A

Figure 4.5.7-5: P50363 Geographic transmission map of project area and MTEP Portal project details.

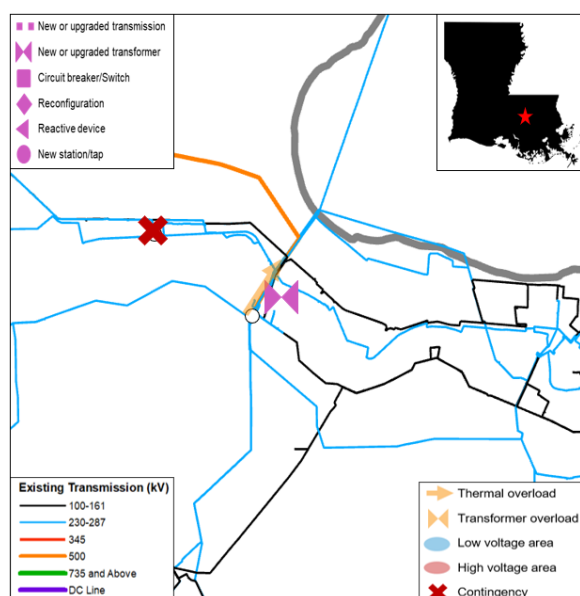
Project Justification: This project is necessary due to a NERC Defined P6 contingency causing low voltage violations at Little Prairie and Mud Lake 230 kV stations.

Cont. Type	Limiting Element	Voltage Threshold (pu)	Pre-Project (post-cont.) Voltage (pu)	Post-Project (post-cont.) Voltage (pu)
P6	Little Prairie 230 kV	.90 – 1.10	0.8352	1.0000
P6	Mud Lake 230 kV	.92 – 1.05	0.8907	0.9999

Table 4.5.7-5: P50363 Voltage loading drivers.



50364 – Waterford 500/230 kV AT Upgrade



Submitting TO	ENTERGY SERVICES, LLC.
Project #	50364
Project Name	Waterford 500/230 kV AT Upgrade
Project Type	BRP
Project Description	Upgrade Waterford 230 kV jumper (~0.26 miles, located inside 230 kV station) to 1200 MVA min.
System Need	NERC TPL-001 Reliability Standards and Entergy's Planning Guidelines. P2.3 Breaker failure of Frisco 230 kV station breaker S4300 overloads the Waterford 230 kV low side jumper to switchyard.
Current Cost	\$0M
Expected ISD	6/1/2030
Target Appendix	A

Figure 4.5.7-6: P50364 Geographic transmission map of project area and MTEP Portal project details.

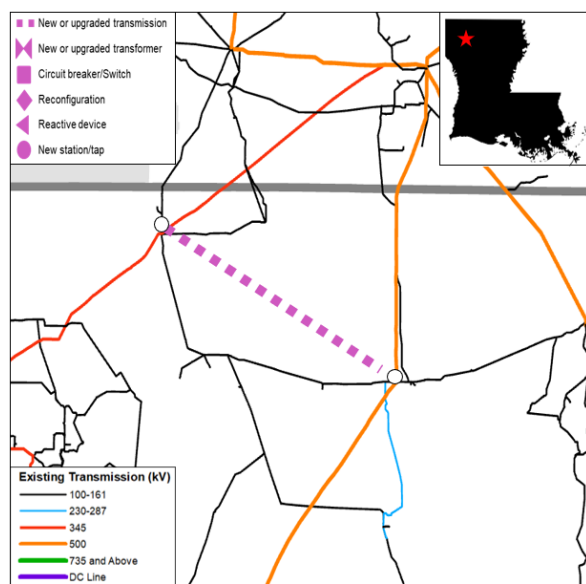
Project Justification: This project is necessary due to a P2 Breaker failure overloading the Waterford 230 kV low side jumper to switchyard.

Cont. Type	Limiting Element	Pre-Project (post-cont.) Loading (%)	Post-Project (post-cont.) Loading (%)
P2	[EES] Waterford 230 kV Bus	100	91

Table 4.5.7-6: P50364 Thermal loading drivers.



50540 – Sarepta to Mount Olive 500 kV Project



Submitting TO	ENTERGY SERVICES, LLC.
Project #	50540
Project Name	Sarepta to Mount Olive 500 kV Project
Project Type	BRP
Project Description	Entergy is proposing to construct • Sarepta 500 kV station including a Sarepta 500-345 kV Autotransformer • New ~60 mile Mt Olive to Sarepta 500 kV line. • Upgrade existing Mt Olive 500-230 kV Autotransformer
System Need	Entergy received a request from a customer adding new load in Holly Ridge, LA. These facilities were identified as needed to maintain NERC compliance during Entergy's studies. Entergy is observing the following thermal violations which require the need for this project: • P6 loss of Sterlington to El Dorado 500 kV and MT Olive to El Dorado 500 kV lines. - o Marion – Huttig 115 kV line - o Marion – Sterlington 115 kV line - o El Dorado E – T.E.P S/F 115 kV line - o El Dorado E – El Dorado 115 kV line - o J1612 – Strong 115 kV line - o J1612 – Huttig 115 kV line - o El Dorado D – El Dorado M 115 kV line - o T.E.P S/F – Strong 115 kV line - o Vienna – Bernice 115 kV line - o Sarepta – Minden 115 kV line - o Minden LG – Minden LA 115 kV line - o Bernice – Junction City 115 kV line - o Upland – Junction City 115 kV line - o Parnell – Newell 115 kV line - o Newell – Upland 115 kV line - o Wyatt – Parnell 115 kV line - o El Dorado Mon – El Dorado
Current Cost	\$470M
Expected ISD	12/1/2028
Target Appendix	A

Figure 4.5.7-7: P50540 Geographic transmission map of project area and MTEP Portal project details.

Project submitted through the Expedited Project Review (EPR) process and a reliability analysis confirmed this project mitigates thermal violations resulting from the Cargas 500 kV and Smalling 500-230 kV Stations project (MTEP ID 50539) and causes no adverse system impact.



Other Projects

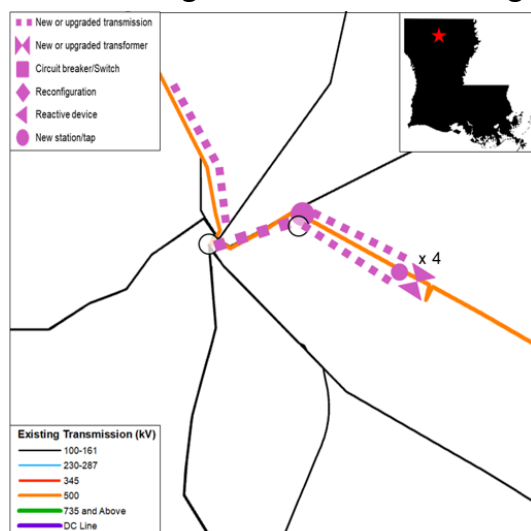
Project ID	Project Name	Other Breakdown	ISD	Estimated Cost (\$M)
*50176	Audubon 230 kV Load Addition and Line upgrades	Load Growth	1/1/2026	\$5.9
*50196	Admiral 138 kV New Substation and Transmission Line	Load Growth	9/1/2025	\$54.4
^50353	2026 ENOL Asset Renewal Program	Age and Condition	12/31/2026	\$3.2
50355	2026 ELL Asset Renewal Program	Age and Condition	12/31/2026	\$83.3
*50528	Benoit 230 kV Station	Load Growth	7/1/2027	\$51.8
*50539	Cargas 500 kV and Smalling 500-230 kV stations	Load Growth	12/1/2026	\$1,210.0
*50546	Bluepoint 230 kV New Substation and line Cut-ins	Load Growth	8/1/2027	\$59.6
*50608	Riparian 115 kV Station	Load Growth	12/30/2026	\$38.2
*50671	RiverPlex 500-230 kV Station	Load Growth	8/30/2028	\$284.0
*50675	Cove Ridge 138 kV Station	Load Growth	12/1/2027	\$24.1

* Project studied through Expedited Project Review (EPR) process.

^ Note this is the single Entergy New Orleans (ENOL) project.



50539 – Cargas 500 kV and Smalling 500-230 kV stations



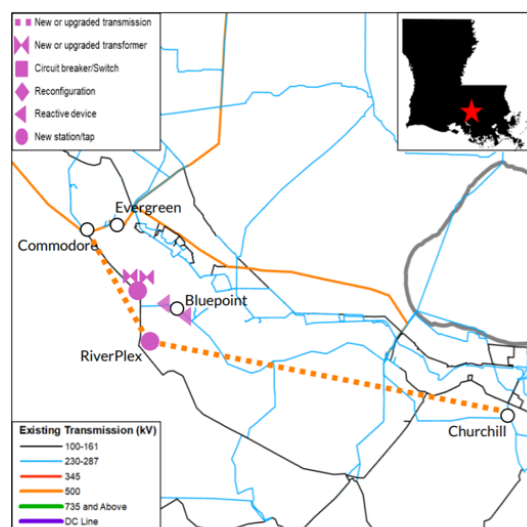
Submitting TO	ENTERGY SERVICES, LLC.
Project #	50539
Project Name	Cargas 500 kV and Smalling 500-230 kV stations
Project Type	Other – Load Growth
Project Description	Entergy is proposing to construct two new 500/230 kV stations to serve a new customer cut into the existing Perryville (Cargas) to Baxter Wilson 500 kV line in Holly Ridge, LA. Cargas 500 kV station will be cut into the Perryville to Sterlington 500 kV lines 1 and 2 and Perryville to Baxter Wilson 500 kV line. Smalling 500/230 kV station will be cut into the Cargas to Baxter Wilson 500 kV line. Two additional 27 mile 500 kV lines from Smalling to Cargas. The Smalling 230 kV station will be a breaker and a half substation, including four 1,500 MVA 500/230 kV autotransformers and eight 230 kV lines going to six 230 kV stations which will feed the new load. Upgrade Sterlington 500 kV Line trap on the El Dorado line, due to the loss of Grand Gulf Generation overloading the Sterlington to El Dorado 500 kV line.
System Need	Entergy received a request from a customer adding new load in Holly Ridge, LA. Upgrades, including this facility, have been identified as needed due to the load growth.
Current Cost	\$1,210M
Expected ISD	12/1/2026
Target Appendix	A

Figure 4.5.7-8: P50539 Geographic transmission map of project area and MTEP Portal project details.

Project submitted through the Expedited Project Review (EPR) process and a reliability analysis showed that any adverse system impact caused by this project is mitigated by the Sarepta to Mount Olive 500 kV (MTEP ID 50540) and the Eldorado 500/345 kV Autotransformer Upgrade (MTEP ID 50541) projects.



50671 – RiverPlex 500-230 kV Station



Submitting TO	ENTERGY SERVICES, LLC.
Project #	50671
Project Name	RiverPlex 500-230 kV Station
Project Type	Other
Project Description	Entergy is proposing to construct a new 500-230 kV station named RiverPlex to serve a new customer cut into the new Commodore to Churchill 500 kV line and the Commodore to Blue Point, Blue Point to Waterford, and Donaldsonville to Evergreen 230 kV lines near Donaldsonville, LA. Two new 230 kV lines will be constructed between RiverPlex 230 kV and the new Mulberry Road 230 kV station which will serve the new load. One new 230 kV line will be constructed between Blue Point and Mulberry Road 230 kV stations. The RiverPlex 500 kV station will be configured as a ring bus, while the RiverPlex 230 kV station will be configured as a breaker and a half bus. Two 500-230 kV 1200 MVA autotransformers will also be installed at the station. The new station has a target ISD in August 2028.
System Need	Entergy received a request from a customer adding new load near Donaldsonville, LA. Upgrades, including this facility, have been identified as needed due to the load growth.
Current Cost	\$284M
Expected ISD	8/30/2028
Target Appendix	A

Figure 4.5.7-9: P50671 Geographic transmission map of project area and MTEP Portal project details.

Project submitted through the Expedited Project Review (EPR) process and a reliability analysis showed that no adverse system impact would be caused by this project.



4.5.8 Entergy Mississippi LLC (EML)

ENTERGY MISSISSIPPI, LLC.

MTEP25 Summary

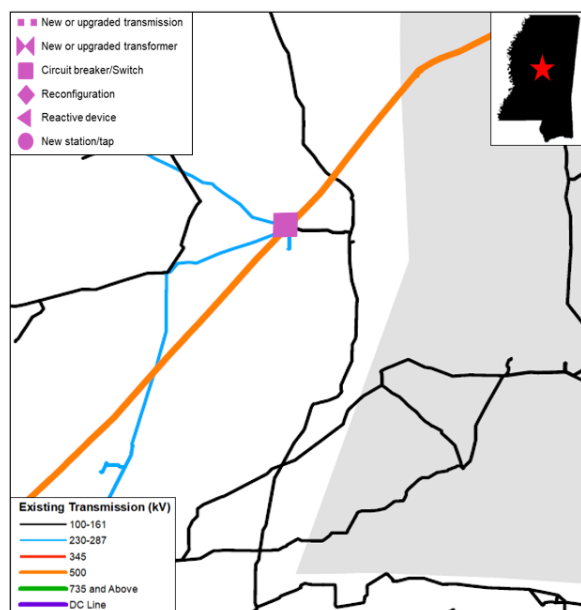
5
Total Projects

\$575M
Investment



Baseline Reliability Projects:

50368 – McAdams 500 kV Bus SPOF



Submitting TO	ENTERGY MISSISSIPPI, LLC.
Project #	50368
Project Name	McAdams 500 kV Bus SPOF
Project Type	BRP
Project Description	All 500kV line panels at McAdams need to have primary 1 relays on a separate DC panel than primary 2/backup relays. - The breakers for these lines must have trip coil #1 and trip coil #2 fed from separate DC panels. - The DC panels must be fed from separate battery sets and the DC panels cannot be wired in series or in parallel to one another.
System Need	NERC TPL-001-5 and Entergy Local Planning Guidelines and Criteria for P5 contingency involving the failure of a non-redundant component of the protection system on the McAdams-Wolf Creek 500kV, McAdams-Lakeover 500kV, or McAdams-Attala 500kV lines followed by a single line to ground fault one of the lines result in Attala and Hinds generation going unstable
Current Cost	\$4M
Expected ISD	6/1/2026
Target Appendix	A

Figure 4.5.8-1: P50368 Geographic transmission map of project area and MTEP Portal project details.

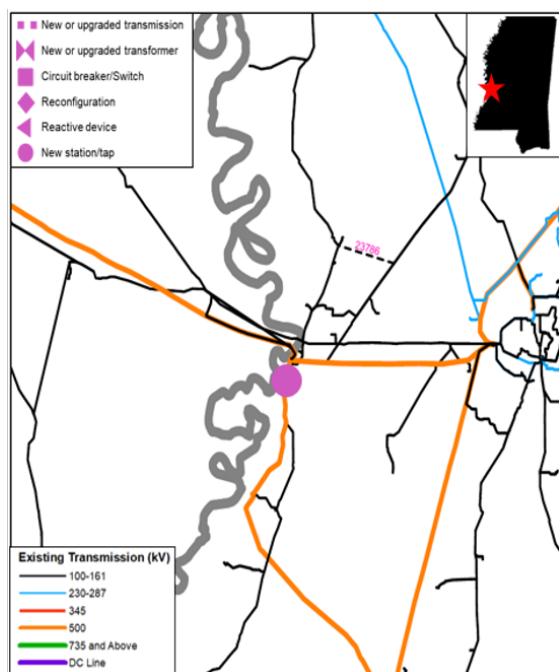


Project Justification: This project is necessary due to a NERC defined P5 contingency event involving the failure of a non-redundant protection system component which causes generation instability affecting the [EML] Attala 500 kV and [EML] Hinds 230 kV generation facilities. The project adds redundant protection system equipment, eliminating the single point of failure contingency.

Other Projects

Project ID	Project Name	Other Breakdown	ISD	Estimated Cost (\$M)
50367	2026 EML Asset Renewal Program	Age and Condition	12/31/2026	\$68.4
50600	Oak Bend 230 kV station	Load Growth	12/1/2029	\$150.0
50601	Andes 230 kV Expansion	Load Growth	4/1/2028	\$40.0
50602	Green Acres 500/230 kV New Substation	Load Growth	12/1/2029	\$312.0

50600 – Oak Bend 230 kV station



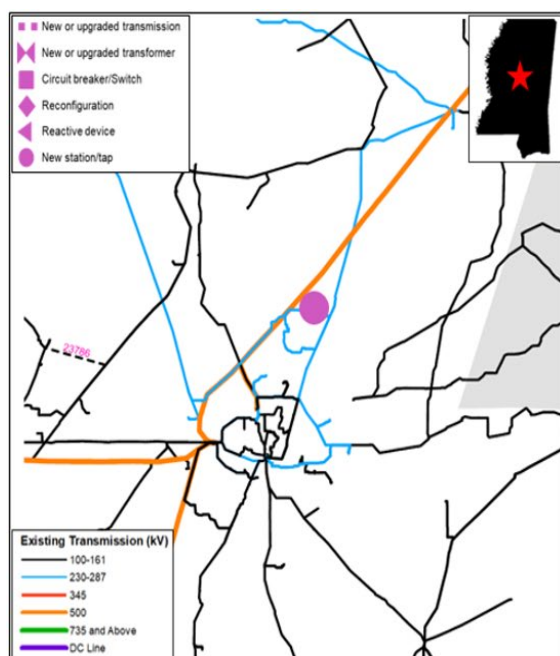
Submitting TO	ENTERGY MISSISSIPPI, LLC.
Project #	50600
Project Name	Oak Bend 230 kV station
Project Type	Other
Project Description	The Oak Bend 230 kV breaker and a half substation will be fed out of a new Baxter Wilson 230 kV substation. The existing Baxter Wilson 500 kV substation will be expanded to include a new Baxter Wilson 230 kV substation fed from 2-500/230 kV Auto Transformers. Two bays to connect to (2) 3-mile 230 kV lines to the Oak Bend 230 kV substation. Customer load will be fed out of (3) 150 MVA 230/34.5 kV transformers.
System Need	Entergy received a request from a customer adding new load in Warren County, MS. Upgrades, including this facility, have been identified as needed due to the load growth.
Current Cost	\$150M
Expected ISD	12/1/2029
Target Appendix	A

Figure 4.5.8-2: P50600 Geographic transmission map of project area and MTEP Portal project details.

Project Justification: MISO performed a reliability analysis and found no reliability issues as a result.



50602 – Green Acres 500/230 kV New Substation



Submitting TO	ENTERGY MISSISSIPPI, LLC.
Project #	50602
Project Name	Green Acres 500/230 kV New Substation
Project Type	Other
Project Description	Construct a new 500/230 kV Green Acres Substation to serve a new customer. Green Acres 500 kV substation will be 4 bay breaker and a half substation. 500 kV will be cut in on Lakeover – Ray Braswell 500 kV and Lakeover - McAdams 500 kV lines. The Green Acres 230 kV station will be a 6 breaker ring expandable breaker and half scheme, including two 1200 MVA 500/230 kV autotransformers and 6 breakers with 5 nodes. 3-1 mile 230 lines supplying the new 230 kV County Line substation to support customer load. Construct County Line 230 kV substation breaker and a half station with 8 bays to support customer load and reactive resources
System Need	Entergy received a request from a customer adding new load in Madison County, MS. Upgrades, including this facility, have been identified as needed due to the load growth.
Current Cost	\$312M
Expected ISD	12/1/2029
Target Appendix	A

Figure 4.5.8-3: P50602 Geographic transmission map of project area and MTEP Portal project details.

Project Justification: MISO performed a reliability analysis and found no reliability issues as a result.

4.5.9 Entergy Texas, Inc. (ETI)

Entergy Texas

MTEP25 Summary

10

Total Projects

\$505M

Investment

\$505M

\$380M ⁷

\$125M ³

● Other ● BRP



Baseline Reliability Projects:

25436 – Bobville Area Menu Phases 1 through 7

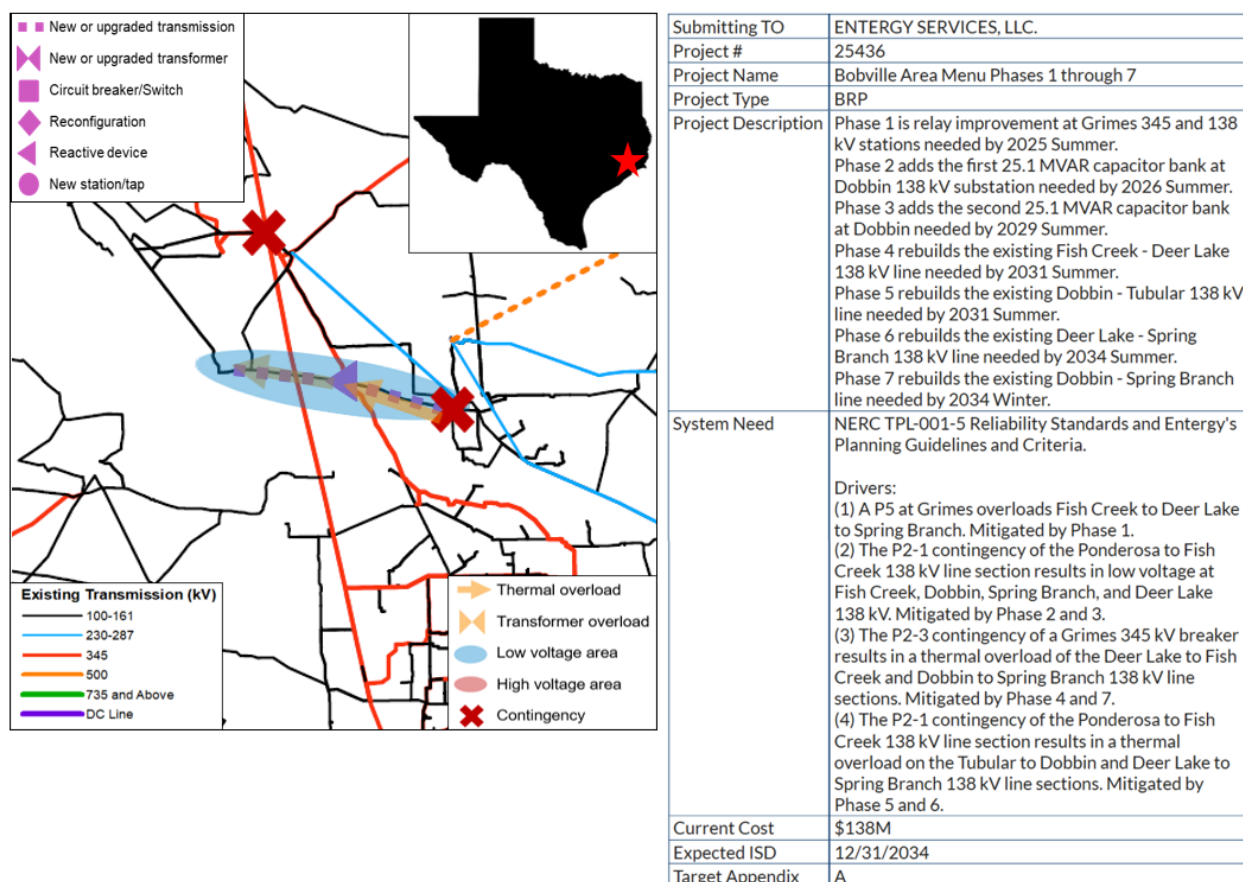


Figure 4.5.9-1: P25436 Geographic transmission map of project area and MTEP Portal project details.

Project Justification: Bobville Area Menu Phase 1 - A P5 contingency at Grimes 345 kV line causes multiple thermal overloads on 138 kV lines. The project adds redundant protection system equipment, eliminating the single point of failure contingency.



Cont. Type	Limiting Element	Pre-Project (post-cont.) Loading (%)	Post-Project (post-cont.) Loading (%)
P5	[ETI] Fish Creek– [ETI] Deer Lake 138 kV line	111	Contingency has been eliminated, so thermal violation is no longer present
P5	[ETI] Spring Branch - [ETI] Deer Lake 138 kV line	102	
P5	[ETI] Walker - [ETI] Rivtrin 138 kV line	101	
P5	[ETI] Lacon - [ETI] Lewis 138 kV line	106	

Table 4.5.9-1: P25436 Thermal loading drivers.

Project Justification: Bobville Area Menu Phases 2 and 3 – A NERC Defined P2.1 contingency causes low voltage on 138 kV stations.

Cont. Type	Limiting Element	Voltage Threshold (pu)	Pre-Project (post-cont.) Voltage (pu)	Post-Project (post-cont.) Voltage (pu)
P21	[ETI] Fish Creek 138 kV	0.92	0.88	0.92
P21	[ETI] Deer Lake 138 kV	0.92	0.89	0.93
P21	[ETI] Spring Branch 138 kV	0.92	0.89	0.94
P21	[ETI] Dobbin 138 kV	0.92	0.91	0.95

Table 4.5.9-2: P25436 Voltage loading drivers.

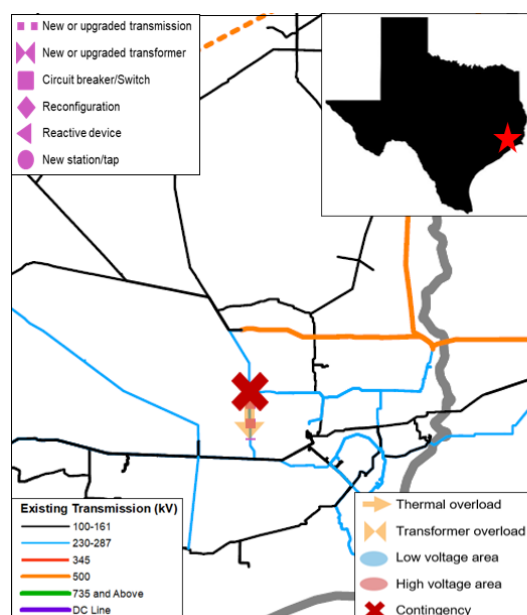
Project Justification: Bobville Area Menu Phases 4 through 7 - A NERC Defined P2.1 contingency causes two thermal overloads on 138 kV lines. Additionally, a NERC Defined P2.3 contingency causes two thermal overloads on 138 kV lines.

Cont. Type	Limiting Element	Pre-Project (post-cont.) Loading (%)	Post-Project (post-cont.) Loading (%)
P21	[ETI] Tubular– [ETI] Dobbin 138 kV line	141	50
P21	[ETI] Dobbin – [ETI] Spring Branch 138 kV line	104	< 40
P23	[ETI] Fish Creek– [ETI] Deer Lake 138 kV line	126	46
P23	[ETI] Spring Branch – [ETI] Deer Lake 138 kV line	116	43

Table 4.5.9-3: P25436 Thermal loading drivers.



50352– Amelia to Poly 69 kV Upgrades



Submitting TO	ENTERGY SERVICES, LLC.
Project #	50352
Project Name	Amelia to Poly 69 kV Upgrades
Project Type	BRP
Project Description	Upgrade station equipment and line sections on Amelia - Poly 69 kV through path.
System Need	The P1.2 contingency of Amelia-Elizabeth 69 kV line causes a thermal overload on Amelia-Poly 69 kV line.
Current Cost	\$4M
Expected ISD	12/31/2029
Target Appendix	A

Figure 4.5.9-2: P50352 Geographic transmission map of project area and MTEP Portal project details.

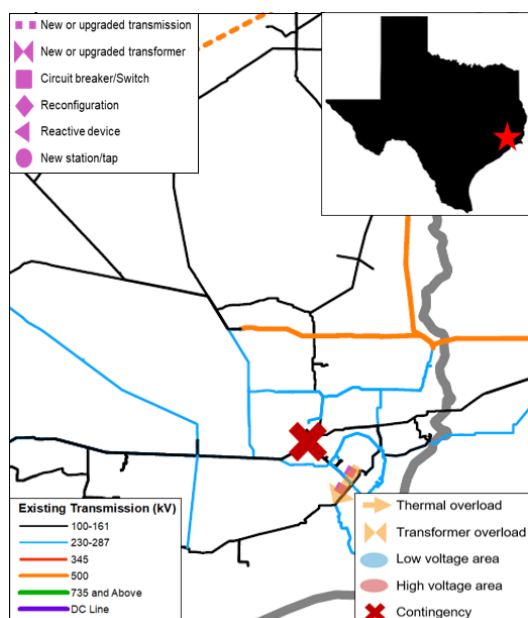
Project Justification: A NERC Defined P1.2 contingency causes a thermal overload on Amelia-Poly 69 kV line.

Cont. Type	Limiting Element	Pre-Project (post-cont.) Loading (%)	Post-Project (post-cont.) Loading (%)
P12	[ETI] Amelia – [ETI] Poly 69 kV line	103	83

Table 4.5.9-4: P50352 Thermal loading drivers.



50354 – Mid County to Stonegate 138 kV Rebuild



Submitting TO	ENTERGY SERVICES, LLC.
Project #	50354
Project Name	Mid County to Stonegate 138 kV Rebuild
Project Type	BRP
Project Description	Rebuild Mid County-Stonegate 138 kV line
System Need	The P7 contingency of Carroll Street Park-South Beaumont 138 kV lines causes thermal overloads on Mid County-Stonegate 138 kV and Dupont-Nitro 69 kV line.
Current Cost	\$7M
Expected ISD	12/17/2027
Target Appendix	A

Figure 4.5.9-3: P50354 Geographic transmission map of project area and MTEP Portal project details.

Project Justification: A NERC Defined P7 contingency causes thermal overloads on Mid County-Stonegate 138 kV line.

Cont. Type	Limiting Element	Pre-Project (post-cont.) Loading (%)	Post-Project (post-cont.) Loading (%)
P7	[ETI] Stonegate– [ETI] Mid Country 138 kV line	103	80

Table 4.5.9-5: P50354 Thermal loading drivers.



50356 – Port Acres Bulk to Legend 230 kV Rebuild

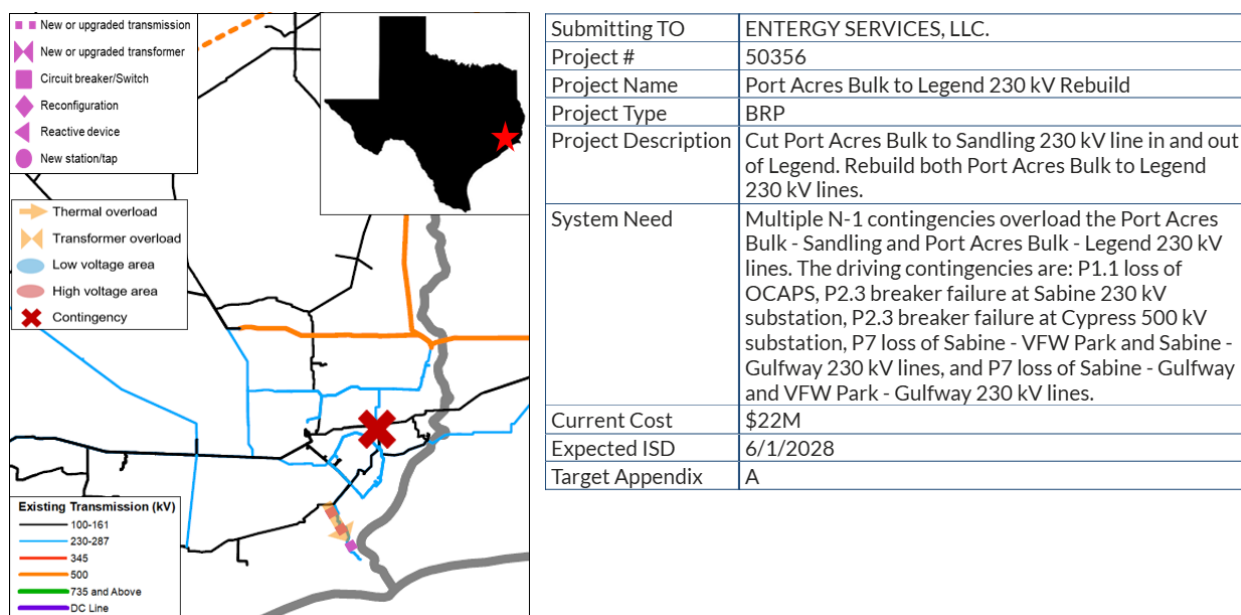


Figure 4.5.9-4: P50356 Geographic transmission map of project area and MTEP Portal project details.

Project Justification: Multiple NERC Defined contingencies overload the Port Acres Bulk - Sandling and Port Acres Bulk - Legend 230 kV lines.

Cont. Type	Limiting Element	Pre-Project (post-cont.) Loading (%)	Post-Project (post-cont.) Loading (%)
P11	[ETI] Port Acres Bulk- [ETI] Legend 230 kV line	107	50
P23	[ETI] Port Acres Bulk- [ETI] Legend 230 kV line	100	29
P71	[ETI] Port Acres Bulk- [ETI] Legend 230 kV line	107	50

Table 4.5.9-6: P50356 Thermal loading drivers.



50358 – Dupont Beaumont to Nitro 69 kV Station Upgrades

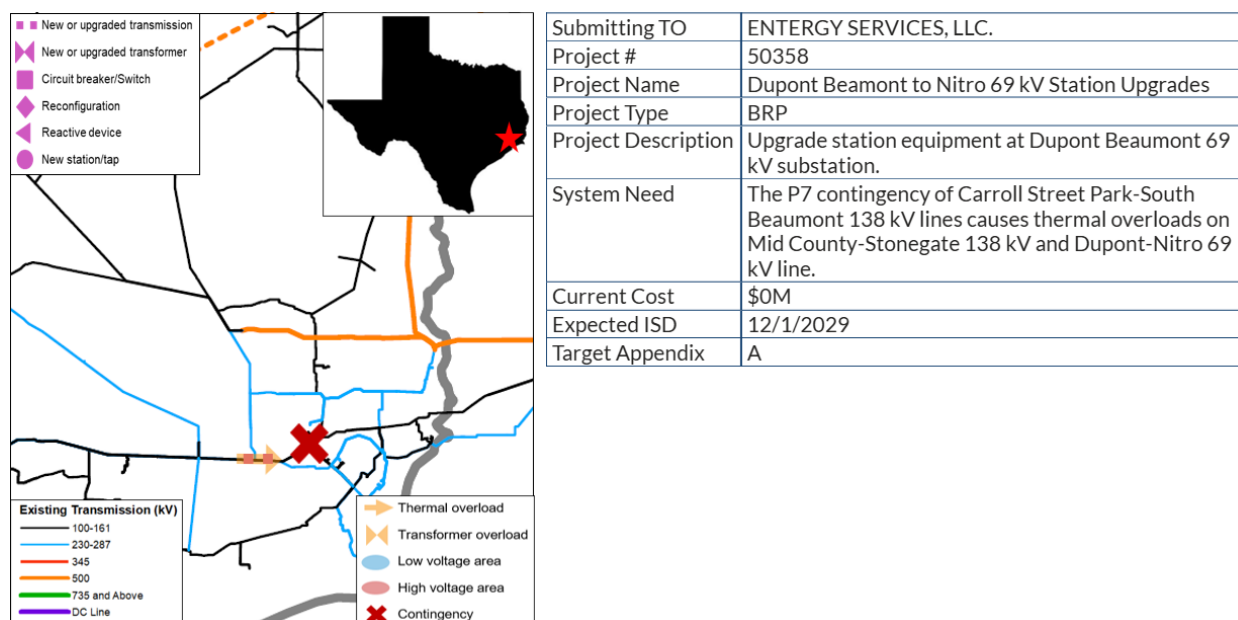


Figure 4.5.9-5: P50358 Geographic transmission map of project area and MTEP Portal project details.

Project Justification: A NERC Defined P7 contingency causes thermal overloads on the Dupont-Nitro 69 kV line based on Entergy's Local Planning Criteria.

Cont. Type	Limiting Element	Pre-Project (post-cont.) Loading (%)	Post-Project (post-cont.) Loading (%)
P7	[ETI] Dupont– [ETI] Nitro 69 kV line	97	54

Table 4.5.9-7: P50358 Thermal loading drivers.



50360 – War Eagle 138 kV: Construct New Substation and Lines

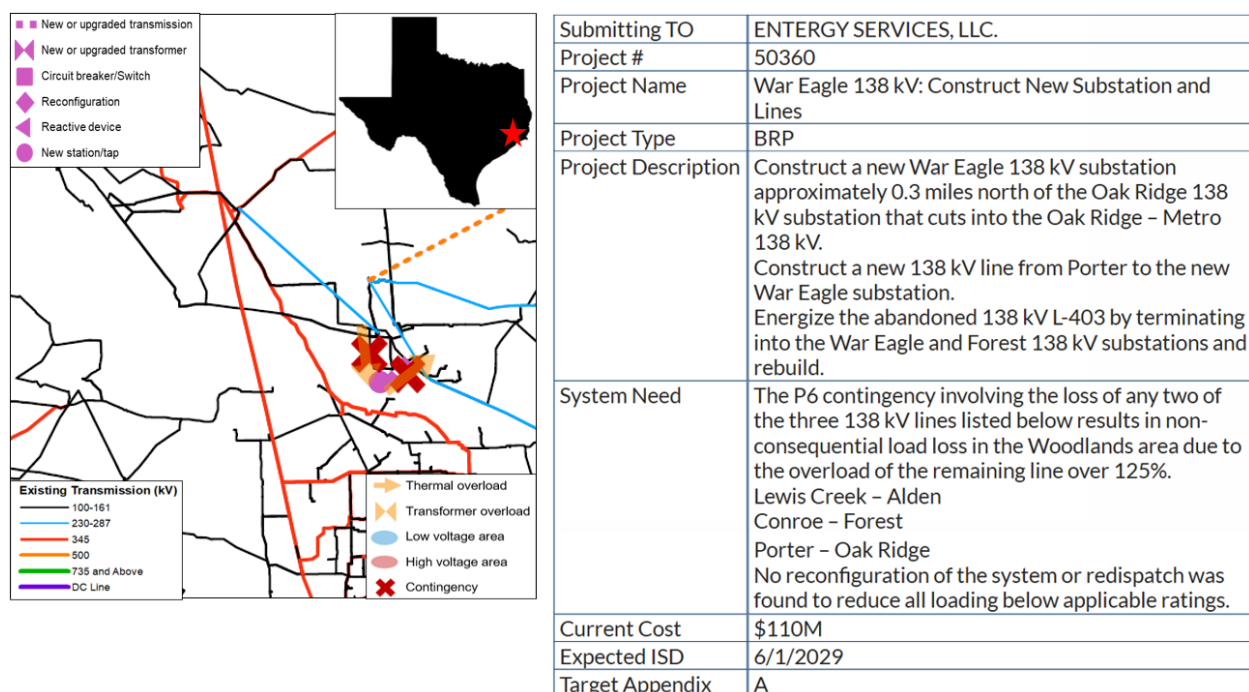


Figure 4.5.9-6: P50360 Geographic transmission map of project area and MTEP Portal project details.

Project Justification: Three different P6 events result in non-consequential load loss in The Woodlands area due to the overload of the remaining line over 125%.

Cont. Type	Limiting Element	Pre-Project (post-cont.) Loading (%)	Post-Project (post-cont.) Loading (%)
P6 (1)	[ETI] Oak Ridge – [ETI] Porter 138 kV line	142	77
P6 (1)	[ETI] Metro – [ETI] Oak Ridge 138 kV line	131	Constraint resolved by project.
P6 (2)	[ETI] Forest– [ETI] Conroe 138 kV line	145	93
P6 (2)	[ETI] Goslin– [ETI] Forest 138 kV line	123	46
P6 (3)	[ETI] Lewis – [ETI] Alden 138 kV line	146	84
P6 (3)	[ETI] Goslin – [ETI] Alden 138 kV line	123	59

Table 4.5.9-8: P50360 Thermal loading drivers.



Other Projects

Project ID	Project Name	Other Breakdown	ISD	Estimated Cost (\$M)
*50199	Rhodair 230 kV New Substation and Transmission Lines	Load Growth	8/26/2025	\$85.0
*50209	South China 138 kV New Substation	Load Growth	5/12/2025	\$5.8
50586	2026 ETI Asset Renewal Program	Age and Condition	12/31/2026	\$34.4

* Project studied through Expedited Project Review (EPR) process.

50199 – Rhodair 230 kV New Substation and Transmission Lines

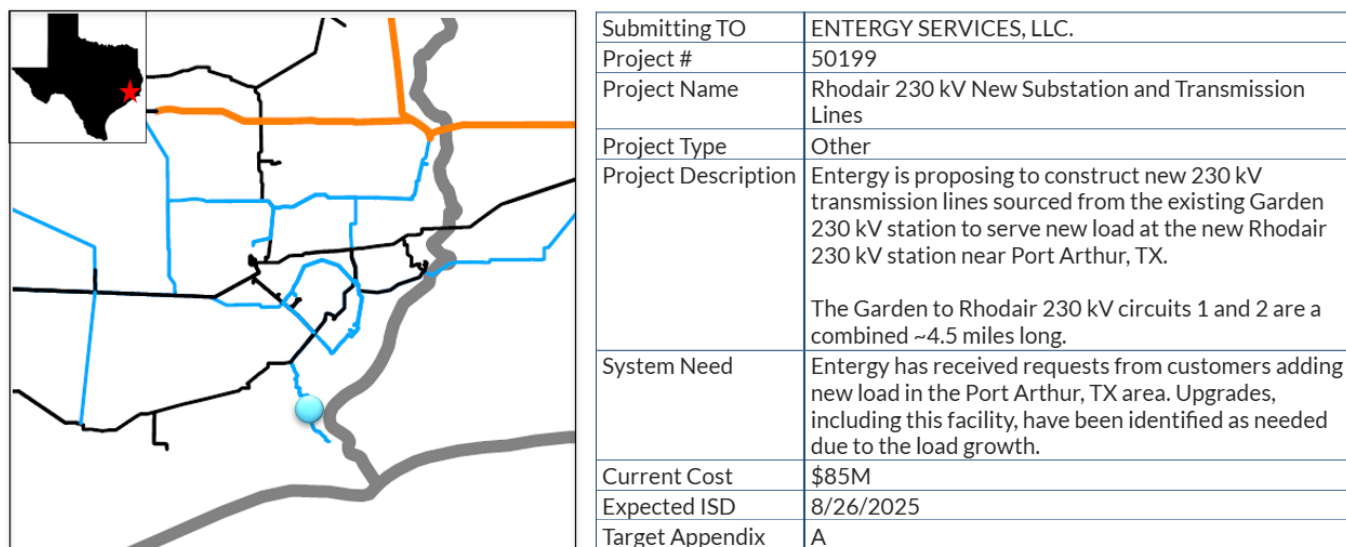


Figure 4.5.9-7: P50199 Geographic transmission map of project area and MTEP Portal project details.

Project Justification: MISO performed a reliability analysis and found no reliability issues as a result.

4.5.10 Lafayette Utilities System (LAFA)

Lafayette Utilities System and MISO are not recommending any new projects for MTEP25.

4.5.11 City Water and Light Jonesboro (CWLT)

City Water and Light Jonesboro and MISO are not recommending any new projects for MTEP25.



4.6 Project Justifications – West Region

West Region Overview

The MISO West Planning Region consists of 21 Transmission-Owning members spanning eight states in the upper Midwest. It includes Iowa, Minnesota, Wisconsin, and parts of North Dakota, South Dakota, Montana, Michigan, and Illinois. These Transmission Owners are:

American Transmission Company (ATC)	Missouri River Energy Services (MRES)
Cedar Falls Utilities (CFU)	Montana-Dakota Utilities Co. (MDU)
Central Minnesota Municipal Power Agency (CMMPA)	Muscatine Power and Water (MPW)
City of Ames, IA (COA)	Northwestern Wisconsin Electric (NWECE)
Dairyland Power Cooperative (DPC)	Otter Tail Power Company (OTP)
Great River Energy (GRE)	Rochester Public Utilities (RPU)
ITC Midwest (ITCM)	Southern Minnesota Municipal Power Agency (SMMPA)
MidAmerican Energy Company (MEC)	Willmar Municipal Utilities (WMU)
Minnesota Municipal Power Agency (MMPA)	WPPI Energy (WPPI)
Minnesota Power (MP)	Xcel Energy (Northern States Power, XEL/NSP)
Minnkota Power Cooperative	

The West planning region contains roughly 30,000 miles of transmission ranging from 57 kV to 500 kV. In the 2027 Summer Peak planning model, the region contains more than 78.7 GW of generation, including 25.7 GW of wind and 9.6 GW of solar. Installed generation capacity in the region consists mostly of wind, coal, solar and gas.

Major generation centers are located in central North Dakota, surrounding the Twin Cities in Minnesota, north of Milwaukee in Wisconsin, and the Quad Cities in Iowa and Illinois, with wind generation located in the eastern Dakotas, western Iowa, and Minnesota (Figure 4.6-1). Major load centers are typically found around larger cities in the region: the Twin Cities, Milwaukee, and Des Moines. In the 2027 Summer Peak planning model, the regional load exceeds 48 GW. Power generally flows from generation-rich areas in the western portion of the region through Minnesota, Iowa, and Wisconsin, toward large load centers in the east. This is especially prevalent in times of high wind output.

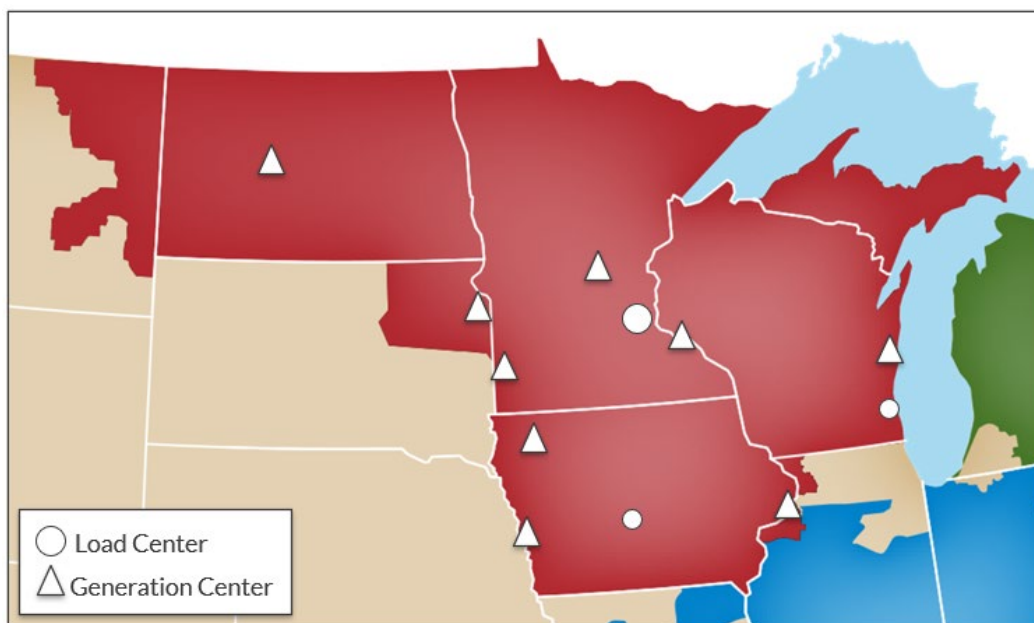


Figure 4.6-1: Generation and load centers in the West Planning Region.



The ten largest project investments in the MISO West region represent nearly \$2.0 billion (52%) of the \$3.8 billion total recommended projects for the West region, or 16% of the \$12.4 billion total recommended in the MISO footprint. The locations of these projects are shown in Figure 4.6-2 and the investment is spread across the West planning region. Projects that are blanket expenditures (relays, physical security, etc.) are excluded from this list.

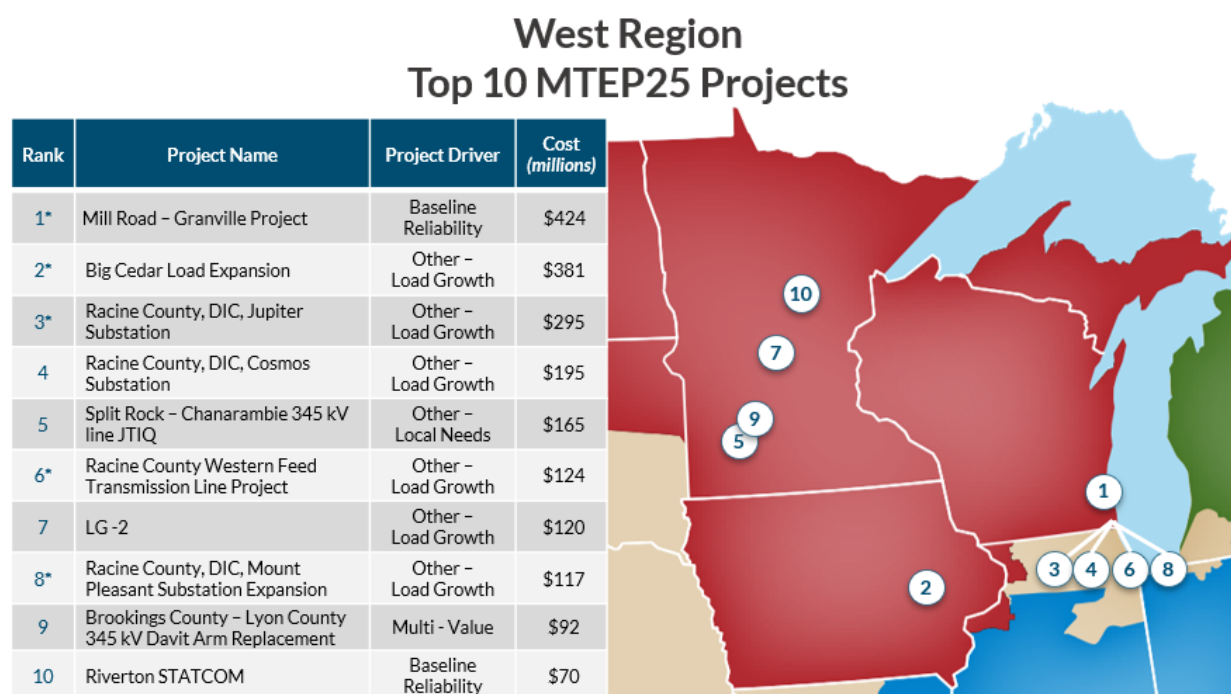


Figure 4.6-2: West region top ten projects by cost; * represents project studied through Expedited Project Review (EPR) process (data as of 8-28-2025).



4.6.1 American Transmission Company (ATC)

AMERICAN TRANSMISSION COMPANY

MTEP25 Summary

74

Total Projects

\$1,904M

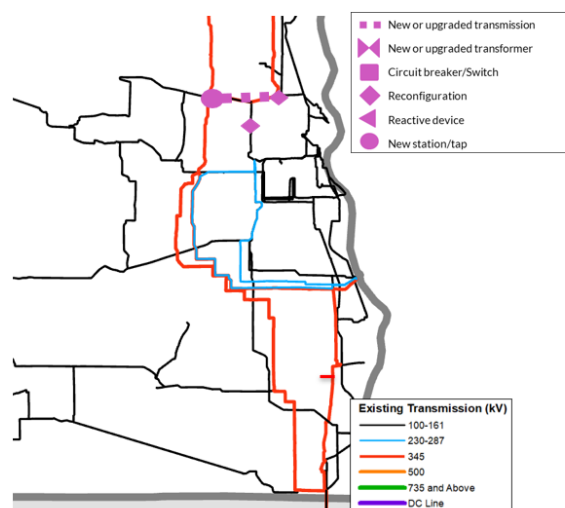
Investment





Baseline Reliability Projects

24919 – Mill Road – Granville Project



Submitting TO	AMERICAN TRANSMISSION COMPANY
Project #	24919
Project Name	Mill Road – Granville Project
Project Type	BRP
Project Description	- Construct new 345/138 kV Mill Road SS, with one 500 MVA 345/138 kV transformer, - Loop in Granville – Arcadian 345 kV line and Cypress – Arcadian 345 kV line to new Mill Road 345 SS, Rebuild Mill Road SS – Granville SS section as 345 kV double circuit, - Loop in Germantown – Bark River 138 kV line and west portion of the Tamarack – Sussex 138 kV line into new Mill Road 138 kV SS, install series reactor in line to Sussex. - Construct new Mill Road SS – Tamarack SS – Butler SS 138 kV line, - Butler SS 138 kV reconfiguration, and install series reactor between Butler bus 1 and bus 2, - Granville SS 345 kV ring bus expansion, Replace 345/138 kV transformer T3.
System Need	Reliability. Address MTEP and TYA reliability P6 (N-1-1) issues, future sensitivities identify N-1 issues. Significant market congestion has been an issue for many years and is expected to become more severe with load interconnections and generation related changes, Portions of the existing 138 kV facilities are within the Asset Life Cycle Program window to replace, Portions of the corridor (line 3453, 3443 and 5041) are required to be rebuilt due to Generator Interconnection queue study limitations.
Current Cost	\$424M
Expected ISD	10/1/2027
Target Appendix	A

Figure 4.6.1-1: P24919 Geographic transmission map of project area and MTEP Portal project details.

Project submitted through the Expedited Project Review (EPR) process and is part of the Racine County Area 2 & 3 EPR Corrective Action Plan.



25161 – Sun Prairie Area Reliability Project

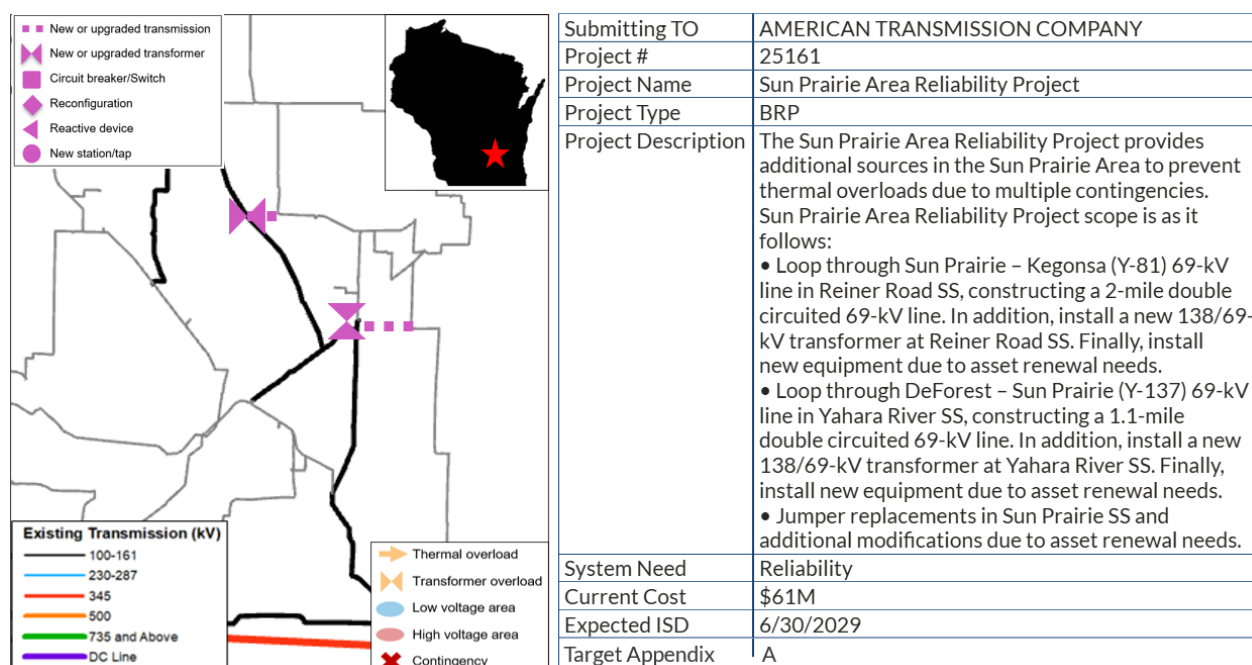


Figure 4.6.1-2: P25161 Geographic transmission map of project area and MTEP Portal project details.

Project Justification: [ATC] Colorado 69 kV to [ATC] Sun Prairie 69 kV line overloads due to NERC defined P6 contingencies in the surrounding area. Post-contingent, the overload is 102%. The Sun Prairie Area Reliability project will bring another source from the 138 kV by installing a new 138/69 kV transformer at the existing Yahara 138 kV station. Additionally, a new connection from [ATC] Reiner Road 69 kV will be made by looping in the [ATC] Gaston Rd 69 kV to [ATC] Sun Prairie 69 kV line. Post-project, the line will only load up to 33% of its rating post-contingent. While this project addresses a known overload from a NERC defined P6 contingency, this project also reduces post-contingent loading on the [ATC] Kegonsa 69 kV- [ATC] Sun Prairie 69 kV corridor for multiple non-BES contingencies.

Cont. Type	Limiting Element	Pre-Project (post-cont.) Loading (%)	Post-Project (post-cont.) Loading (%)
P6	[ATC] Colorado – [ATC] Sun Prairie 69 kV	102	33

Table 4.6.1-1: P25161 Thermal loading drivers.



50529 – Appleton Area Reliability Project

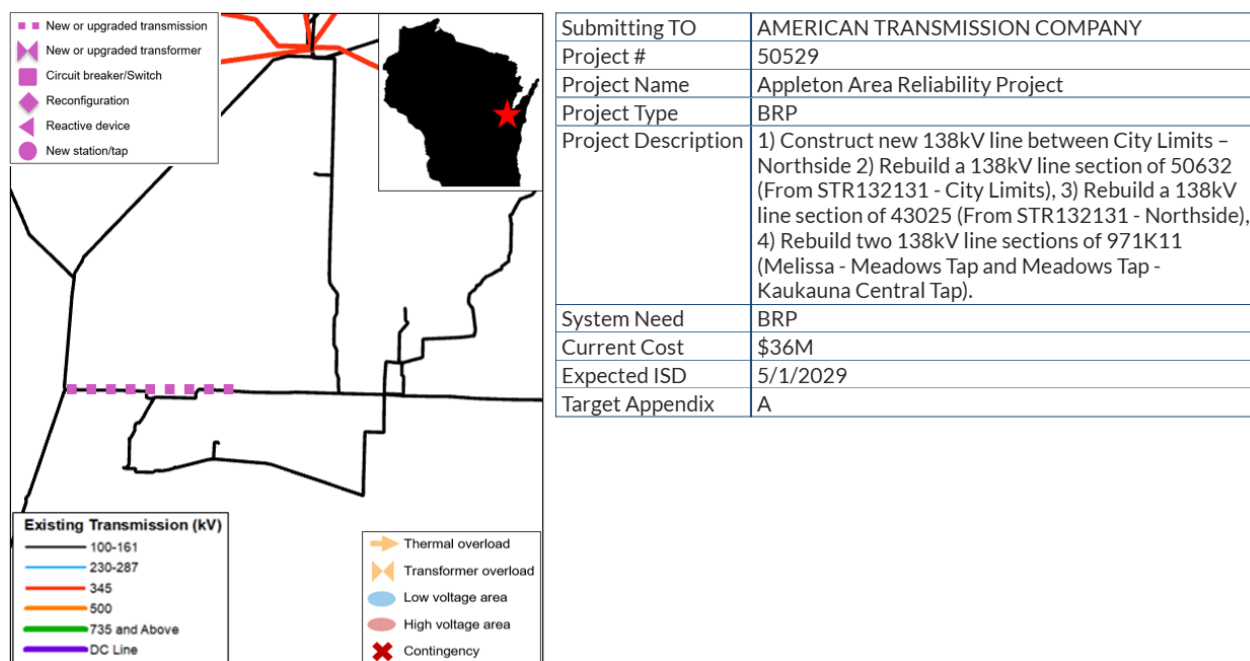


Figure 4.6.1-3: P50529 Geographic transmission map of project area and MTEP Portal project details.

Project Justification: The Appleton Area Reliability Project was identified in MTEP24 Steady State Analysis and has been under development as an Appendix B project in the MTEP Portal. System reconfiguration options were available to mitigate the issues in MTEP24; however, MTEP25 Steady State Analysis showed higher loadings compared to MTEP24, prompting ATC to move the identified project to Appendix A.

Multiple lines overload due to NERC TPL defined P6 contingencies in the Appleton Area. Post-contingent, the maximum overload is up to 126%. Additionally, post-contingent low voltage violations are seen at multiple buses in the area. The tables on the following slide detail the highest loadings post-contingency.

Bringing a fourth 138 kV line into the area mitigates all overloads and voltage violations and provides additional headroom for future growth in the area.

Cont. Type	Limiting Element	Pre-Project (post-cont.) Loading (%)	Post-Project (post-cont.) Loading (%)
P6	[ATC] Forest Junction – [ATC] Lake Park 138 kV	124	52
P6	[ATC] Lake Park– [ATC] City Limits 138 kV	112	41
P6	[ATC] City Limits– [ATC] Butte Des Morts 138 kV	120	68

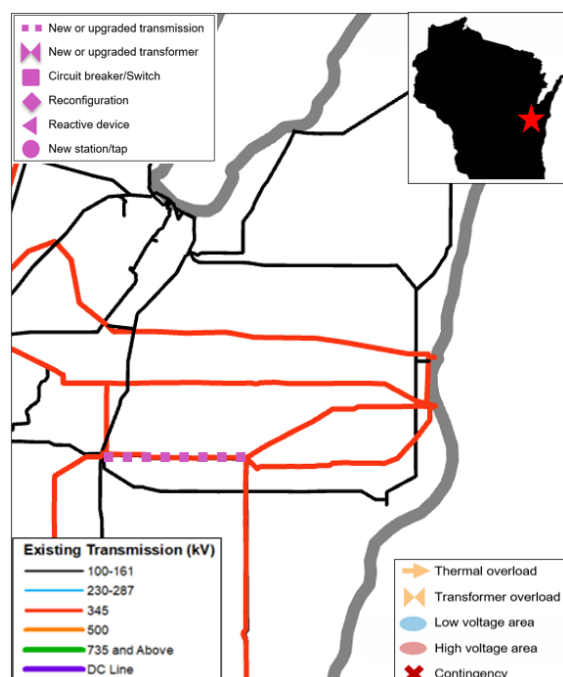
Table 4.6.1-2: P50529 Thermal loading drivers.



Cont. Type	Limiting Element	Voltage Threshold (pu)	Pre-Project (post-cont.) Voltage (pu)	Post-Project (post-cont.) Voltage (pu)
P6	[ATC] Apple Hills	.90	.88	.95
P6	[ATC] MAES	.90	.89	.96
P6	[ATC] Combined Locks	.90	.89	.97

Table 4.5.9-3: P50529 Voltage loading drivers.

50588 – Forest Junction – Branch River 345 kV (W-15), Line Uprate



Submitting TO	AMERICAN TRANSMISSION COMPANY
Project #	50588
Project Name	Forest Junction – Branch River 345 kV (W-15), Line Uprate
Project Type	BRP
Project Description	Uprate W-15 Forest Junction – Branch River 345 kV line per ATC T-Line design standards to achieve minimum 1918 Amps (1146 MVA) normal and 2490 Amps (1488 MVA) emergency ratings for all seasons.
System Need	BRP
Current Cost	\$8M
Expected ISD	1/1/2029
Target Appendix	A

Figure 4.6.1-4: P50588 Geographic transmission map of project area and MTEP Portal project details.

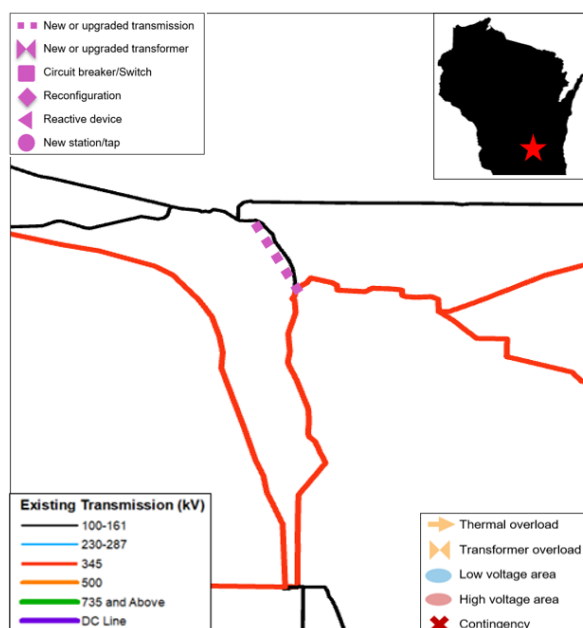
Project Justification: [ATC] Forest Junction 345 kV to [ATC] Branch River 345 kV line overloads due to multiple NERC defined P6 contingencies in the surrounding area. Post-contingent, the maximum overloads is up to 129%. Uprating this line will eliminate the need to redispatch generation between contingencies. Post-project, the line will only load up to 64% of its rating post-contingent.

Cont. Type	Limiting Element	Pre-Project (post-cont.) Loading (%)	Post-Project (post-cont.) Loading (%)
P6	[ATC] Forest Junction – [ATC] Branch River 345 kV	129	64

Table 4.6.1-4: P50588 Thermal loading drivers.



50673 – Portage – Columbia 138 kV (X-13/X-20), Reconductor



Submitting TO	AMERICAN TRANSMISSION COMPANY
Project #	50673
Project Name	Portage - Columbia 138 kV (X-13/X-20), Reconductor
Project Type	BRP
Project Description	This project resolves thermal overloads under single contingency conditions on either the X-13 or X-20 lines between Portage and Columbia.
System Need	Reliability
Current Cost	\$17M
Expected ISD	6/30/2027
Target Appendix	A

Figure 4.6.1-5: P50673 Geographic transmission map of project area and MTEP Portal project details.

Project Justification: [ATC] Columbia – [ATC] Portage 138 kV lines overload due to NERC defined P1 and P2 contingencies from the latest MTEP25 Steady State results. Post-contingent, the maximum overload is 110%. Reconductoring these lines will mitigate these overloads. Post-project, the line will only load up to 88% of its rating post-contingent.

Cont. Type	Limiting Element	Pre-Project (post-cont.) Loading (%)	Post-Project (post-cont.) Loading (%)
P1, P2	[ATC] Columbia – [ATC] Portage 138 kV	110	88

Table 4.6.1-5: P50673 Thermal loading drivers.

Other Projects

Project ID	Project Name	Other Breakdown	ISD	Estimated Cost (\$M)
21922	Sigel - Vesper 69 kV (Y-108/Y-107), Partial Rebuild	Age and Condition	12/31/2030	\$5.5
23841	Pine – Skanawan Tap – Eastom 115 kV (I-9), OPGW Addition & Partial Rebuild	Local Needs	5/31/2031	\$47.0
24474	Winnebago County, New DIC	Load Growth	10/1/2026	\$2.9
24924	Straits SS Power Transformer Asset Renewal	Age and Condition	12/1/2027	\$11.2
24925	Range Line Dist (WE) - Range Line Switchyard 138 kV (61452), Replace Underground Cable	Age and Condition	6/1/2028	\$6.0



Project ID	Project Name	Other Breakdown	ISD	Estimated Cost (\$M)
24982	Range Line Dist (WE) - Range Line Switchyard 138 kV (61441), Replace Underground Cable	Age and Condition	6/1/2028	\$4.0
25185	Small Capital Project and Asset Renewal Program 2026	Age and Condition	6/30/2028	\$45.0
25186	Communications Reliability Program 2026	Local Needs	6/30/2028	\$2.1
25187	Load Interconnection Program 2026	Load Growth	6/30/2028	\$19.0
25203	Highland – Hill Valley 138 kV, Construct New Line	Local Reliability	9/3/2026	\$9.5
25240	Line Clearance Mitigation Program 2026	Local Reliability	6/30/2028	\$9.0
25314	Pittsville Area Reliability Project	Local Reliability	12/31/2028	\$35.9
50124	Portage SS Relay and Breaker Asset Renewal	Age and Condition	12/1/2028	\$7.1
50125	Rock River SS and Remote Ends Asset Renewal	Age and Condition	12/1/2028	\$5.6
50126	Coyne Street SS Relay, Breaker and House Asset Renewal	Age and Condition	12/1/2028	\$8.0
50127	Finger Road SS Relays and Remote Ends Asset Renewal	Age and Condition	12/1/2028	\$5.8
50128	Eden SS Relay and House Asset Renewal	Age and Condition	12/1/2028	\$5.1
50134	Huiskamp - Division Street Tap 69 kV (Y-132), Rebuild	Age and Condition	11/30/2028	\$8.5
50145	Beloit Area DIC, New Substation	Load Growth	6/30/2027	\$9.0
50146	BOC Gasses Tap – Town Line Road 138 kV (X-111), Rebuild	Local Reliability	1/1/2027	\$2.4
50161	Empire Mine – Huron 138 kV (X-119), OPGW Addition	Local Needs	12/31/2027	\$13.0
50162	Substation Technology Package #2 – 2026	Local Needs	12/31/2026	\$11.7
*50165	Racine County, DIC, Stratus Substation	Load Growth	1/1/2027	\$68.5
*50166	Racine County, DIC, Mount Pleasant Substation Expansion	Load Growth	1/1/2027	\$117.0
*50167	Racine County, DIC, Jupiter Substation	Load Growth	1/1/2027	\$295.0
*50168	Racine County Western Feed Transmission Line Project	Load Growth	1/1/2027	\$124.0
50172	Arpin SS Power Transformer Asset Renewal	Age and Condition	12/1/2028	\$9.8
50173	Ellinwood SS Power Transformer Asset Renewal	Age and Condition	12/1/2028	\$9.9
50200	PLPL81 and W-30 345 kV Line, Uprate	Local Reliability	1/31/2027	\$9.5
*50223	Whitewater – Sugar Creek 138 kV (WHIG53), Flow Control Device	Load Growth	1/1/2027	\$3.4
*50225	North Lake Geneva – Elkhorn 138 kV (X-55), Rebuild	Local Reliability	8/15/2026	\$23.9



Project ID	Project Name	Other Breakdown	ISD	Estimated Cost (\$M)
50233	Birnamwood Area Reliability Project	Local Reliability	12/31/2028	\$17.5
50255	Huiskamp - Ruskin 69 kV (6937), OPGW Addition	Local Needs	12/31/2026	\$4.0
50262	Chaffee Creek SS Breaker Asset Renewal	Age and Condition	12/1/2028	\$5.2
50519	Reactor Relocation from North Madison SS to J1502 POI SS	Local Reliability	6/30/2028	\$5.2
50532	Stiles - Sherwood 138 kV (L-142), Partial Rebuild	Age and Condition	12/31/2028	\$7.0
50543	Racine County, DIC, Cosmos Substation	Load Growth	4/1/2028	\$195.0
50547	East Beloit SS, DIC, Sub Rebuild	Load Growth	12/30/2028	\$7.2
50548	Juneau Industrial SS, DIC, Transformer Addition	Load Growth	6/1/2027	\$4.8
50549	Wilson St SS, DIC, Transformer Addition	Load Growth	12/31/2028	\$3.2
50550	North Monroe Breaker and SCADA Asset Renewal	Age and Condition	12/1/2028	\$3.1
50598	Progress SS, DIC, Substation Rebuild	Load Growth	6/30/2027	\$2.5
50612	Terrace Ave Riser SS 69 kV Pumping Plant Upgrade	Age and Condition	12/1/2027	\$3.2
50613	Central SS, DIC, New Substation	Load Growth	4/1/2026	\$3.2
50622	Substation High Voltage Protection (HVP) Equipment Removal	Local Needs	11/30/2027	\$3.0
50642	Substation Technology Package #3 - 2026	Local Needs	12/31/2026	\$3.0
50670	Werner SS Relay and Remote Asset Renewal	Age and Condition	12/1/2026	\$4.5
50702	Elm Road HVB Breaker and Relay Asset Renewal	Age and Condition	12/1/2029	\$8.4
50724	North Appleton - Werner West (NAPL31) 345 kV, Rerate	Local Reliability	12/26/2026	\$5.3

* Project studied through Expedited Project Review (EPR) process.



50165, 50167 - Racine County Area 2 & 3, DIC

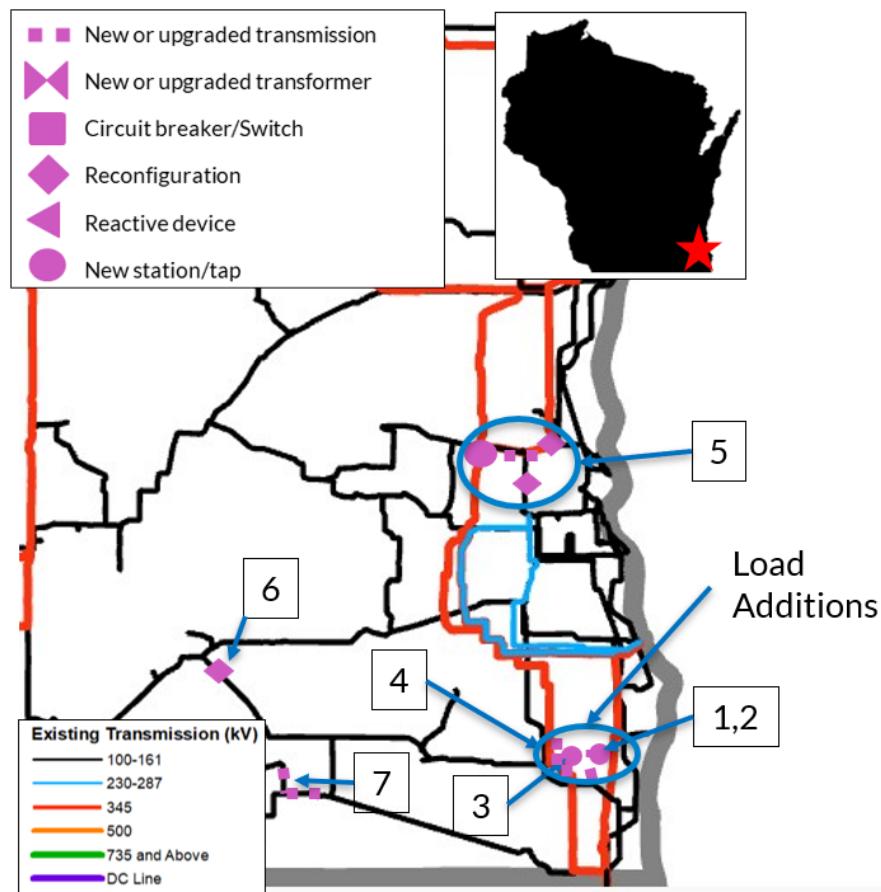


Figure 4.6.1-6: P50673 Geographic transmission map of project area and MTEP Portal project details.

Project submitted through the Expedited Project Review (EPR). Through MISO reliability analysis, P6 issues were identified in the 2029 Shoulder High Wind and Winter Cases. No remaining N-1 issues. All other identified issues were P6 issues – all were mitigated through a valid Corrective Action Plan (CAP). The following projects are a part of the CAP:

	Project ID	Project Name	Expected ISD	Current Cost (\$M)
1	50165	Racine County, DIC, Stratus Substation	1/1/2027	\$60
2	50166	Racine County, DIC, Mount Pleasant Substation Expansion	9/1/2025	\$114
3	50167	Racine County, DIC, Jupiter Substation	1/1/2027	\$295
4	50168	Racine County Western Feed Transmission Line Project	1/1/2027	\$124
5	24919	Mill Road – Granville Project	6/1/2027	\$385



	Project ID	Project Name	Expected ISD	Current Cost (\$M)
6	50223	Whitewater – Sugar Creek 138 kV (WHIG53), Flow Control Device	1/1/2027	\$3
7	50225	North Lake Geneva – Elkhorn 138 kV (X-55), Rebuild	1/1/2027	\$17

Generator Interconnection Projects

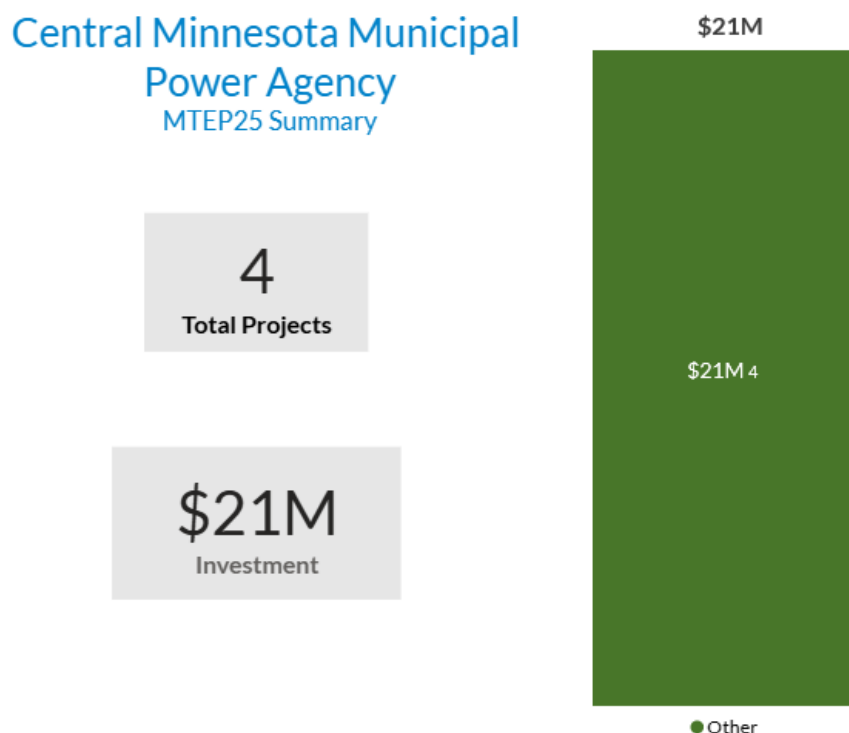
Project ID	Project Name	ISD	Estimated Cost (\$M)
50495	J1745 Fitzgerald SS Network Upgrades and Interconnection Facilities	6/11/2029	\$2.0
50505	J1793 Holland SS Network Upgrades	12/9/2025	\$0.1
50506	J1706 North Monroe SS Network Upgrades and Interconnection Facilities	6/11/2029	\$18.3
50507	J1508 Galvin Ave SS Network Upgrades and Interconnection Facilities	3/13/2029	\$14.1
50508	J1629 Welsh Prairie SS Network Upgrades and Interconnection Facilities	9/10/2030	\$21.5
50511	J1746 Columbia SS Network Upgrades and Interconnection Facilities	6/11/2029	\$1.8
50512	J1778 Paris SS Network Upgrades	11/9/2027	\$0.8
50514	J1502 Emerson Rd SS Network Upgrades and Interconnection Facilities	6/30/2028	\$19.8
50515	J1779 Rockdale SS Interconnection Facilities	10/31/2027	\$0.03
50516	S1017 Tennyson SS Network Upgrades	4/30/2025	\$0.2
50517	S1018 7 Mile Creek SS Network Upgrades	8/3/2026	\$1.5
50518	J1773 J1781 MPFCA Network Upgrades	10/10/2027	\$7.6
50530	J1750 Grace Lake SS Network Upgrades and Interconnection Facilities	3/13/2029	\$12.1
50533	S1016 Lone Rock SS Network Upgrades	9/5/2026	\$0.8
50534	J1824 Academy SS Network Upgrades and Interconnection Facilities	12/8/2029	\$10.2
50535	J1732 Wolfram Rd SS Network Upgrades and Interconnection Facilities	3/13/2029	\$9.9
50542	S1025 Sheepskin SS Network Upgrades	6/15/2027	\$0.2
50544	MPFCA Rockdale SS Network Upgrade	10/10/2027	\$1.1
50545	J1752 Shady Dr SS Network Upgrades and Interconnection Facilities	4/4/2029	\$16.5
50655	R1049/R5061 Edgewater SS, Network Upgrades and Interconnection Facilities	9/30/2026	\$0.3



4.6.2 Cedar Falls Utilities (CFU)

Cedar Falls Utilities and MISO are not recommending any new projects for MTEP25.

4.6.3 Central Minnesota Municipal Power Agency (CMMPA)



Other Projects

Project ID	Project Name	Other Breakdown	ISD	Estimated Cost (\$M)
50261	Blue Earth - North Transmission Substation Add 84/140 MVA transformer	Load Growth	12/31/2026	\$11.2
50268	Blue Earth Rice Street Transformer Replacement	Load Growth	5/31/2026	\$2.4
50269	Blue Earth Northeast Add 2nd Transformer 20-37.3 MVA	Load Growth	5/31/2026	\$4.8
50275	Blue Earth West Sub Transformer Upgrade	Load Growth	5/31/2029	\$2.9

4.6.4 City of Ames, IA (COA)

City of Ames, IA and MISO are not recommending any new projects for MTEP25.



4.6.5 Dairyland Power Cooperative (DPC)

DAIRYLAND POWER COOPERATIVE

MTEP25 Summary



Other Projects

Project ID	Project Name	Other Breakdown	ISD	Estimated Cost (\$M)
50271	Rock Dell-Pleasant Valley N469 Rebuild	Age and Condition	3/1/2028	\$1.2
50272	Genoa Dist Tap-Ringe Tap N470 Rebuild	Age and Condition	6/2/2026	\$3.0

Generator Interconnection Projects

Project ID	Project Name	ISD	Estimated Cost (\$M)
50270	J1808 Generation Interconnection Network Upgrades	7/2/2027	\$1.4



4.6.6 Great River Energy (GRE)

GREAT RIVER ENERGY

MTEP25 Summary

27

Total Projects

\$317M

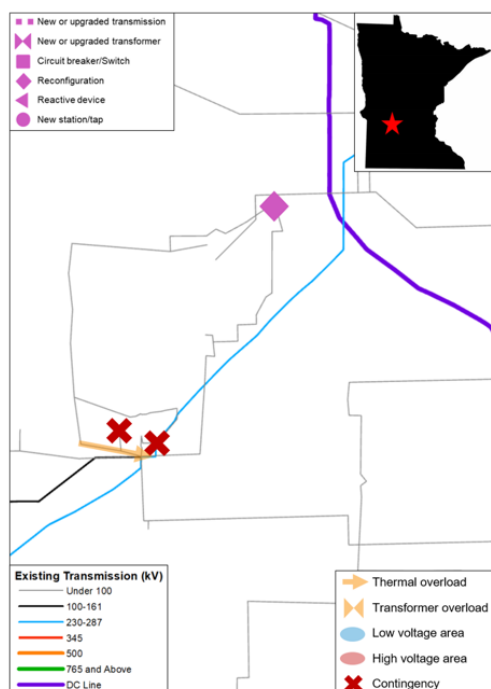
Investment





Baseline Reliability Projects

50472 – Hawick Breaker Station



Submitting TO	GREAT RIVER ENERGY
Project #	50472
Project Name	Hawick Breaker Station
Project Type	BRP
Project Description	Convert the Hawick switching station to a breaker station by installing three breakers at the existing site.
System Need	As part of a Willmar area study, a breaker station at Hawick was seen to eliminate existing N-1-1 (or N-2 with system adjustments allowed) thermal overloads in the area and provide margin for load growth. This project will be done in conjunction with other Willmar Municipal projects in the area identified as part of the same study
Current Cost	\$2M
Expected ISD	9/30/2026
Target Appendix	A

Figure 4.6.6-1: P50472 Geographic transmission map of project area and MTEP Portal project details.

Project Justification: The [GRE] Willmar Southwest Tap – [MRES] Willmar 69 kV line overloads as a result of NERC defined P6 contingencies in the surrounding area. Post-contingent, the line overloads up to 104%. Converting the Hawick substation to a breaker station will eliminate these overloads by allowing previously open switches around Hawick to operate as normally closed. Post-project, the line will only load up to 77% of its rating post-contingent.

Cont. Type	Limiting Element	Pre-Project (post-cont.) Loading (%)	Post-Project (post-cont.) Loading (%)
P6	[GRE] Willmar Southwest Tap – [MRES] Willmar 69 kV line	104	77

Table 4.6.6-1: P50472 Thermal loading drivers.

Other Projects

Project ID	Project Name	Other Breakdown	ISD	Estimated Cost (\$M)
50237	Butternut Area Projects	Age and Condition	12/21/2029	\$4.9
50242	New Sweden Area Projects	Age and Condition	2/28/2030	\$7.0



Project ID	Project Name	Other Breakdown	ISD	Estimated Cost (\$M)
50243	Merton Area Projects	Age and Condition	9/30/2030	\$9.3
50263	Rush City Area Projects	Age and Condition	8/31/2029	\$11.8
50264	Soderville Area Projects	Age and Condition	3/31/2031	\$21.3
50265	Victor Area Projects	Age and Condition	12/12/2029	\$8.1
50266	Green Lake Area Projects	Age and Condition	4/30/2030	\$12.8
50267	Johnsville Double End	Local Reliability	12/31/2029	\$2.4
50273	Heartland Lakes Area Projects	Local Needs	10/1/2029	\$8.5
50274	Iona Area Projects	Local Reliability	12/31/2027	\$2.3
50284	Cormorant to Pelican Rapids Rebuild Projects	Age and Condition	11/29/2030	\$15.1
50304	Slayton Area Projects	Local Needs	12/31/2025	\$0.9
50305	Blue Earth Substation Rebuild Projects	Local Needs	10/29/2027	\$1.4
50392	Elk River Muni West	Local Reliability	10/30/2026	\$0.07
50394	Riverton Asset Renewal	Age and Condition	5/29/2026	\$2.6
50415	Grand Lake Area Projects	Local Needs	10/31/2025	\$1.2
50416	Pine City Breaker Replacement	Age and Condition	12/31/2027	\$1.4
50418	Denham - Kettle River Rebuild	Age and Condition	12/31/2026	\$11.4
50419	Bena Area Projects	Age and Condition	11/29/2029	\$17.5
50425	Fischer Substation Rebuild	Age and Condition	12/8/2025	\$1.5
50427	Winthrop to Bell rebuild projects	Age and Condition	8/31/2028	\$9.9
50473	Pennock Area Projects	Local Reliability	12/31/2029	\$11.0
50481	LG - 2	Load Growth	12/31/2030	\$120.0
50482	LG - 3	Load Growth	12/31/2026	\$25.0
50587	Darnen Substation	Load Growth	9/15/2026	\$2.4



Generator Interconnection Projects

Project ID	Project Name	ISD	Estimated Cost (\$M)
50420	Lakefield Area Project	8/24/2027	\$5.2

4.6.7 ITC Midwest (ITCM)

ITC MIDWEST MTEP25 Summary

19
Total Projects

\$545M
Investment





Baseline Reliability Projects

50211 – Hayward – County Line – Ellendale 69 kV Rebuild

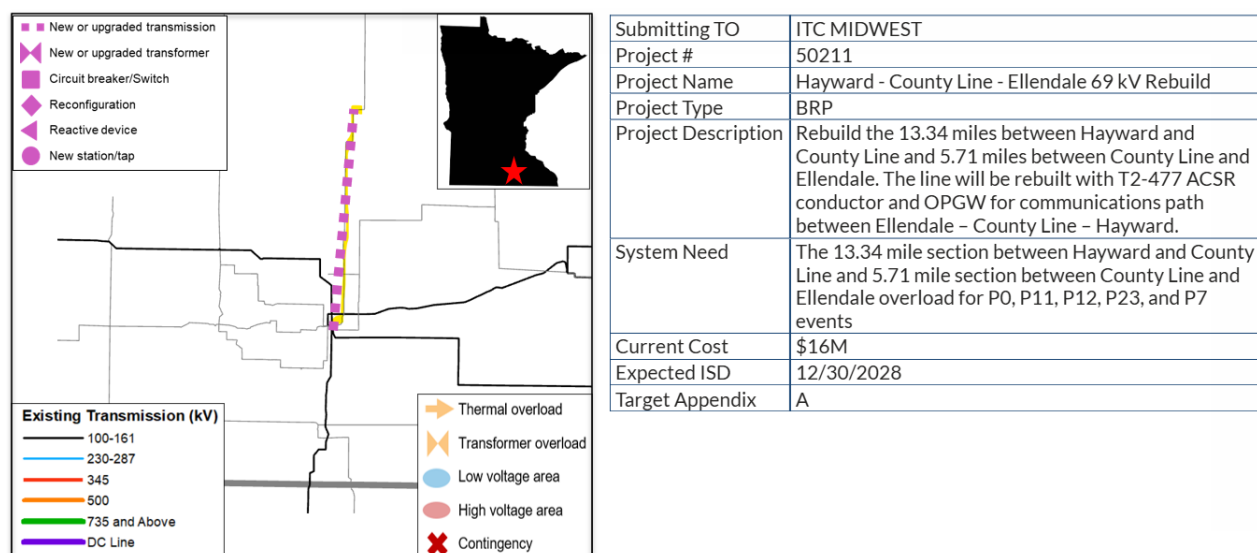


Figure 4.6.7-1: P50211 Geographic transmission map of project area and MTEP Portal project details.

Project Justification: The lines between Hayward and County Line, and between County Line and Ellendale, are overloaded under the NERC TPL-001 Category P6 contingency in the 2029 Summer Peak model. Increasing the line ratings for the sections between Hayward–County Line and County Line–Ellendale will mitigate the thermal overloads.

Cont. Type	Limiting Element	Pre-Project (post-cont.) Loading (%)	Post-Project (post-cont.) Loading (%)
P6	[ALTW] Hayward West – [ALTW] Lerd South 69 kV line	111	38
P6	[ALTW] Lerd South – [ALTW] County Line 69 kV line	109	38

Table 4.6.7-1: P50211 Thermal loading drivers.

Other Projects

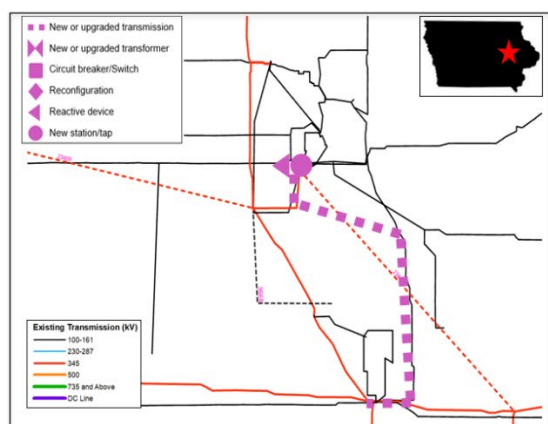
Project ID	Project Name	Other Breakdown	ISD	Estimated Cost (\$M)
*50157	Big Cedar Load Expansion	Load Growth	9/30/2028	\$380.5
50204	Clinton Rail and Air Park 161 kV Interconnection	Load Growth	6/1/2026	\$8.8
50205	Belmond Diesel to Hancock 69 kV Line Reroute	Age and Condition	12/31/2028	\$4.1
50206	Rock Creek T2 Replacement	Age and Condition	12/31/2027	\$1.0



Project ID	Project Name	Other Breakdown	ISD	Estimated Cost (\$M)
50207	Spirit Lake Anchor 69 kV Interconnection	Load Growth	12/31/2028	\$5.4
50210	Keokuk West Relay Replacement and 69 kV Tie Breaker Addition	Age and Condition	12/31/2027	\$3.0
50213	Rock Creek 345 kV Substation Expansion and Rock Creek - Quad Cities #2 345 kV line	Local Reliability	12/31/2028	\$44.4
50378	ITC Midwest SCADA Controlled Motor Operated Switch Addition blanket	Local Reliability	12/31/2026	\$3.1
50379	ITC Midwest Load interconnection blanket	Load Growth	12/31/2027	\$3.8
50380	ITC Midwest Asset Management blanket	Age and Condition	12/31/2027	\$53.9

* Project studied through Expedited Project Review (EPR) process.

50157 – Big Cedar Load Expansion



Submitting TO	ITC MIDWEST
Project #	50157
Project Name	Big Cedar Load Expansion
Project Type	Other
Project Description	Interstate Power and Light Company (IPL) has requested to interconnect two new loads to the transmission system the Cedar Rapids, Iowa area. ITC Midwest is proposing to serve the new load from the Big Cedar Switching Station which requires expansion to serve the two new loads. In addition to expanding the Big Cedar Switching Station, ITC Midwest will be installing reactive compensation at the Big Cedar Switching Station to support this load addition. ITC Midwest will also add a 2nd Big Cedar – Morgan Valley 345 kV line on the existing structures of the Big Cedar – Morgan Valley 345 kV line and construct a new Beverly – Hills 345 kV line to support the load addition. The L RTP Tranche 1 Marshalltown (Twinkle) - Morgan Valley 345 kV line is required to support the first phase of the load addition, and the L RTP Tranche 1 Beverly – Sub 92 345 kV line is required to support the second phase of the load addition.
System Need	In order to reliably serve the two new requested loads, upgrades on the ITC Midwest transmission system are required. These upgrades include expansion of the Big Cedar Switching Station, an additional 345 kV line/source into the Cedar Rapids area, and reactive power compensation at Big Cedar to support system contingent voltages. In addition to the upgrades included here the Morgan Valley - Twinkle (Marshalltown) Tranche 1 L RTP project and Beverly - Sub 92 Tranche 1 L RTP project are also required to ensure system reliability with these load additions.
Current Cost	\$381M
Expected ISD	9/30/2028
Target Appendix	A

Figure 4.6.7-2: P50157 Geographic transmission map of project area and MTEP Portal project details.



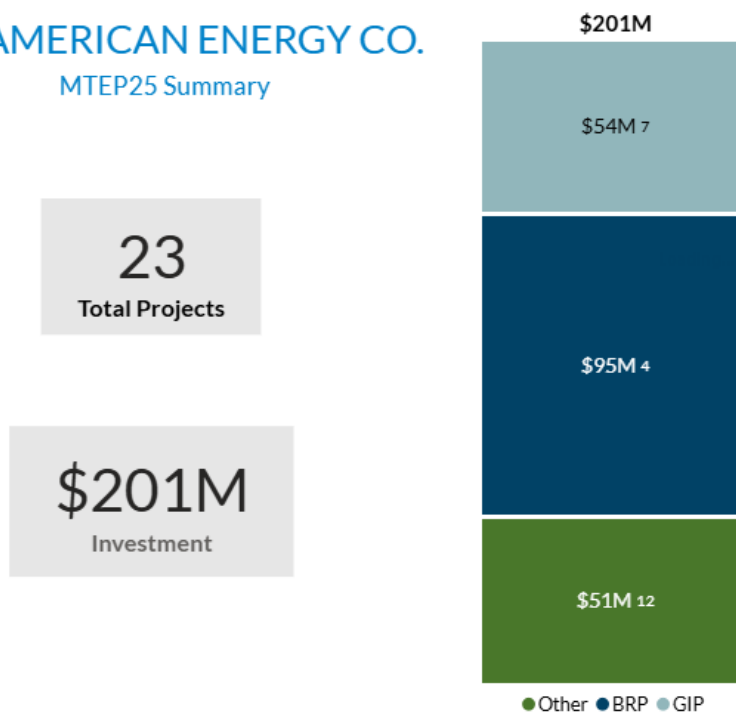
Project Justification: MISO performed a reliability analysis and found no reliability issues as a result.

Generator Interconnection Projects

Project ID	Project Name	ISD	Estimated Cost (\$M)
50231	J1359 Generator Interconnection - TOIF - PCI 69 kV Terminal & Line	2/27/2026	\$1.8
50232	J1359 Generator Interconnection - Network Upgrades - PCI 69 kV Bus	3/1/2026	\$0.4
50235	J1444 Generator Interconnection - TOIF - DAEC 345 kV Terminal	9/1/2025	\$0.8
50236	J1444 Generator Interconnection - Network Upgrade	9/1/2025	\$3.8
50238	MPFCA J1503 & J1504 - TOIF - Huntley 345 kV Terminal	10/31/2027	\$1.1
50239	MPFCA J1503 & J1504 - Network Upgrades - Huntley 345 kV Bus	10/31/2027	\$5.5
50240	J1520 Generator Interconnection - TOIF	10/31/2027	\$1.1
50244	J1520 Generator Interconnection - Network Upgrades	10/31/2027	\$4.0

4.6.8 MidAmerican Energy Company (MEC)

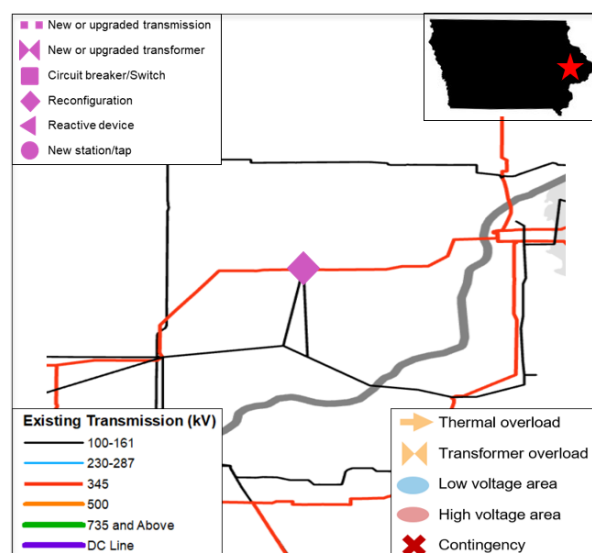
MIDAMERICAN ENERGY CO. MTEP25 Summary





Baseline Reliability Projects

50329 – Substation 91 Expansion



Submitting TO	MIDAMERICAN ENERGY CO.
Project #	50329
Project Name	Substation 91 Expansion
Project Type	BRP
Project Description	Expand Substation 91 by converting the 345 kV yard to a ring bus configuration and by installing a second 345-161 kV transformer.
System Need	NERC TPL-001-5 Corrective Action Plan for thermal and voltage violations identified in the MTEP24 study for Category P6 N-1-1 contingencies.
Current Cost	\$66M
Expected ISD	12/31/2028
Target Appendix	A

Figure 4.6.8-1: P50329 Geographic transmission map of project area and MTEP Portal project details.

Project Justification: Low voltages at Substations 70 and 88 were observed in the MTEP24 2026 Summer Peak model under a NERC TPL-001 Category P6 contingency involving loss of the [MEC] Substation 91 transformer and the [MEC] Substation A-[MEC] Substation 70 161 kV line. In 2029, the Substation 91 transformer is overloaded under a similar contingency. Installing a second 345/161 kV transformer at [MEC] Substation 91 will address both the voltage and thermal violation in the Iowa Quad Cities area.

Cont. Type	Limiting Element	Pre-Project (post-cont.) Loading (%)	Post-Project (post-cont.) Loading (%)
P6	[MEC] Sub 91 5 161 kV- [MEC] SUB 91 3 345 kV line	101	60

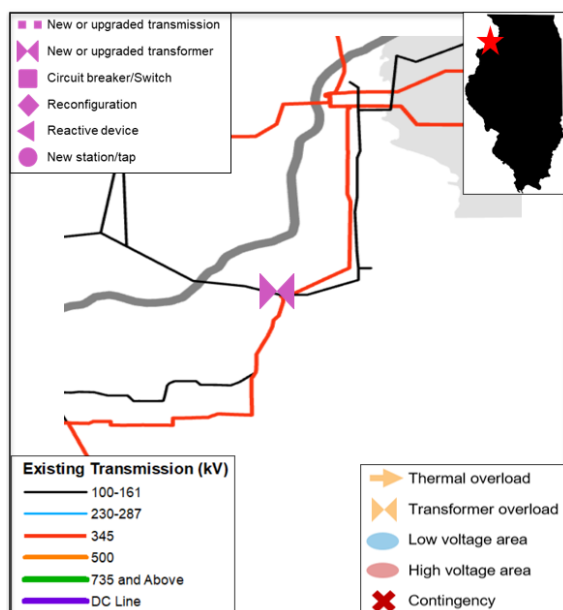
Table 4.6.8-1: P50329 Thermal loading drivers.

Cont. Type	Limiting Element	Voltage Threshold (pu)	Pre-Project (post-cont.) Voltage (pu)	Post-Project (post-cont.) Voltage (pu)
P6	[MEC] Sub 70 5 161 kV	0.9300	0.9260	0.9779
P6	[MEC] Sub 88 161 kV	0.9300	0.9275	0.9794

Table 4.6.8-2: P50329 Voltage loading drivers.



50331 – Substation 39 Replace 345-161 kV Transformer 9T1



Submitting TO	MIDAMERICAN ENERGY CO.
Project #	50331
Project Name	Substation 39 Replace 345-161 kV Transformer 9T1
Project Type	BRP
Project Description	At Substation 39, replace the existing 345-161 kV, 500 MVA Transformer 9T1 with a new 560 MVA transformer.
System Need	NERC TPL-001-5 Corrective Action Plan for thermal violations identified in the MTEP24 study for Category P6 N-1-1 contingencies.
Current Cost	\$11M
Expected ISD	6/1/2029
Target Appendix	A

Figure 4.6.8-2: P50331 Geographic transmission map of project area and MTEP Portal project details.

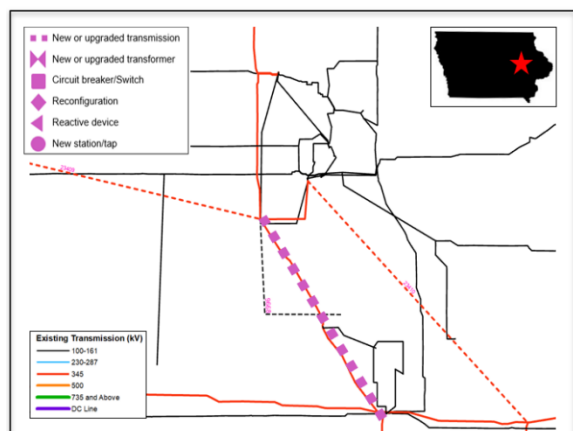
Project Justification: The existing Substation 39 345/161 kV Transformer 9T1 is overloaded in the MTEP24 2029 Summer Peak model under the NERC TPL-001 Category P6 contingency involving the loss of [MEC] Substation 39 Transformer 9T2 and the [CE] Quad Cities– [MEC] Substation 91 345 kV line. Upgrading the rating of the existing transformer will mitigate this overload.

Cont. Type	Limiting Element	Pre-Project (post-cont.) Loading (%)	Post-Project (post-cont.) Loading (%)
P6	[MEC] East Moline/Sub39 5 161 kV– [MEC] East Moline/Sub39 3 345 kV	101	84

Table 4.6.8-3: P50331 Thermal loading drivers.



50497 – MidAmerican Upgrades for MTEP 50157 Big Cedar Load Expansion

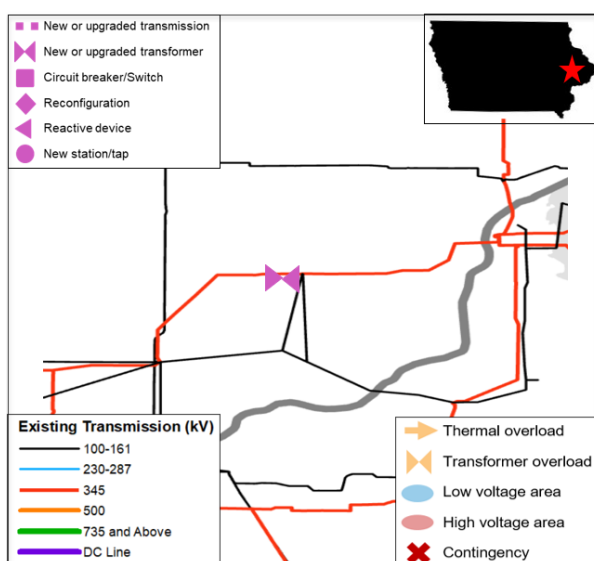


Submitting TO	MIDAMERICAN ENERGY CO.
Project #	50497
Project Name	MidAmerican Upgrades for MTEP 50157 Big Cedar Load Expansion
Project Type	BRP
Project Description	Network upgrades on MidAmerican Energy's transmission system identified during the MISO Expedited Project Review study for MTEP 50157 Big Cedar Load Expansion
System Need	MISO MTEP 50157 Big Cedar Load Expansion Expedited Project Review study identified network upgrades to meet NERC TPL-001-5 compliance
Current Cost	\$17M
Expected ISD	12/31/2028
Target Appendix	A

Figure 4.6.8-3: P50497 Geographic transmission map of project area and MTEP Portal project details.

Project submitted through the Expedited Project Review (EPR) process and was identified during the ITCM P50157 Big Cedar EPR study (see study for more information).

50624 – Substation 74: Relocate 161 kV Capacitor Bank from Substation A



Submitting TO	MIDAMERICAN ENERGY CO.
Project #	50624
Project Name	Substation 74: Relocate 161 kV Capacitor Bank from Substation A
Project Type	BRP
Project Description	Relocate the existing 161 kV, 50.4 MVAR capacitor bank from Substation A to Substation 74.
System Need	Address low voltage violations identified in the MTEP24 steady state analysis for NERC TPL-001 Category P6 N-1-1 contingencies.
Current Cost	\$2M
Expected ISD	6/1/2026
Target Appendix	A

Figure 4.6.8-4: P50624 Geographic transmission map of project area and MTEP Portal project details.

Project Justification: Low voltages at Substations 70 and 88 were observed in the MTEP24 2026 Summer Peak model under a Category P6 event involving loss of the [MEC] Substation 91 transformer and the [MEC] Substation A–[MEC] Substation 70 161 kV line. Relocating the 50.4 MVAR capacitor bank from [MEC] Substation A to [MEC] Substation 74 will mitigate these voltage issues. The installation of a second [MEC] Substation 91 345-161 kV transformer (MTEP 50329) is the preferred long term corrective action for this low voltage issue, but the project cannot be completed before the summer 2026 need date identified in the MTEP24 study.



Cont. Type	Limiting Element	Voltage Threshold (pu)	Pre-Project (post-cont.) Voltage (pu)	Post-Project (post-cont.) Voltage (pu)
P6	[MEC] Sub 70 5 161 kV	0.9300	0.9160	0.9779
P6	[MEC] Sub 88 161 kV	0.9300	0.917	0.9794

Table 4.6.8-4: P50624 Voltage loading drivers.

Other Projects

Project ID	Project Name	Other Breakdown	ISD	Estimated Cost (\$M)
50319	West Des Moines 69 kV Breaker Replacement	Local Reliability	12/1/2026	\$2.6
50320	E. 17th & Washington 69 kV bus expansion and line breaker installations	Local Reliability	6/1/2028	\$0.0
50321	E. 17th & Broadway 69 kV breaker installations	Local Reliability	10/1/2028	\$0.0
50324	88th Street Substation bus expansion and 161-13 kV transformer installation	Load Growth	12/31/2027	\$9.0
50325	NE Ankeny - Ames 161 kV relay replacements	Local Reliability	10/1/2025	0.4
50328	Neal North: Replace 161-69 kV Transformer Relaying & 69 kV Breaker Replacement	Age and Condition	12/1/2029	\$1.5
50330	Plymouth-Merrill 69 kV Line Uprate	Local Reliability	6/1/2026	\$0.3
50332	Division-Eastside 69 kV Line Rebuild & Terminal Upgrades	Local Reliability	6/1/2027	\$2.2
50333	Franklin: Replace Nuthatch Line Relaying	Local Reliability	6/19/2025	\$0.3
50334	Eagle Grove-Goldfield 69 kV Interconnection and Clarion-Latimer 69 kV Line Rebuild	Load Growth	6/1/2028	\$12.0
50335	Johnson Creek Add 161 kV Breakers	Load Growth	8/1/2027	\$2.0
50336	Substation Equipment Replacement Blanket	Age and Condition	12/31/2028	\$21.0

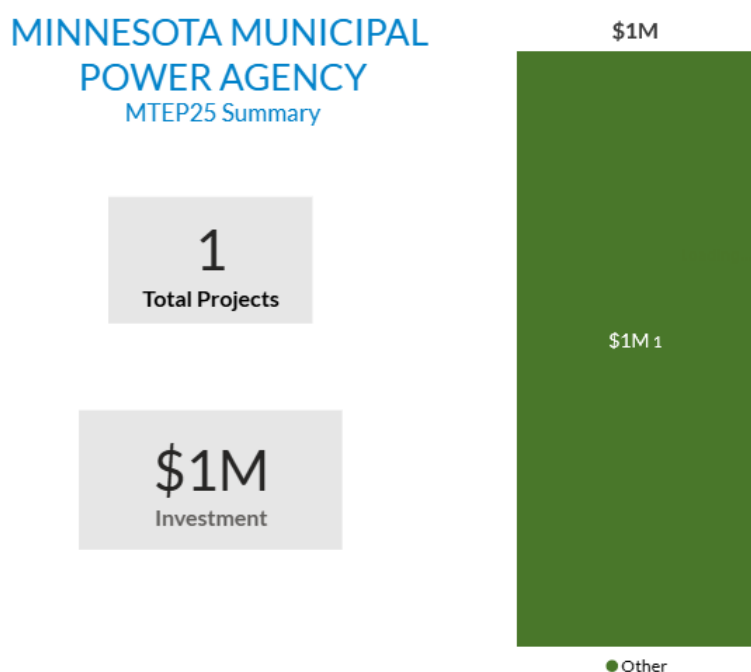
Generator Interconnection Projects

Project ID	Project Name	ISD	Estimated Cost (\$M)
50192	J1529 POI New 69 kV Interconnection Substation and 69 kV Line Taps	9/1/2027	\$13.8
50193	J1530 POI New 69 kV Interconnection Substation and 69 kV Line Taps	9/1/2027	\$13.8
50194	J1532 POI New 69 kV Interconnection Substation and 69 kV Line Taps	9/1/2027	\$13.9



Project ID	Project Name	ISD	Estimated Cost (\$M)
50195	Carroll County-Carroll South 69 kV Line Rebuild for DPP 2020	12/1/2027	\$7.5
50254	Remsen Township 345 kV Substation Expansion for J1590	9/15/2026	\$4.0
50318	Adams County-Creston 161 kV Line Uprate for DPP 2020	9/1/2027	\$0.7
50327	Raun: Tekamah 161 kV Line Relay Replacement SPP DISIS-2017	9/1/2028	\$0.8

4.6.9 Minnesota Municipal Power Agency (MMPA)



Other Projects

Project ID	Project Name	Other Breakdown	ISD	Estimated Cost (\$M)
50234	MN River Breaker Install (position 5M518)	Local Reliability	2/15/2027	\$0.6



4.6.10 Minnesota Power (MP)

MINNESOTA POWER INC.

MTEP25 Summary

8

Total Projects

\$100M

Investment

\$100M

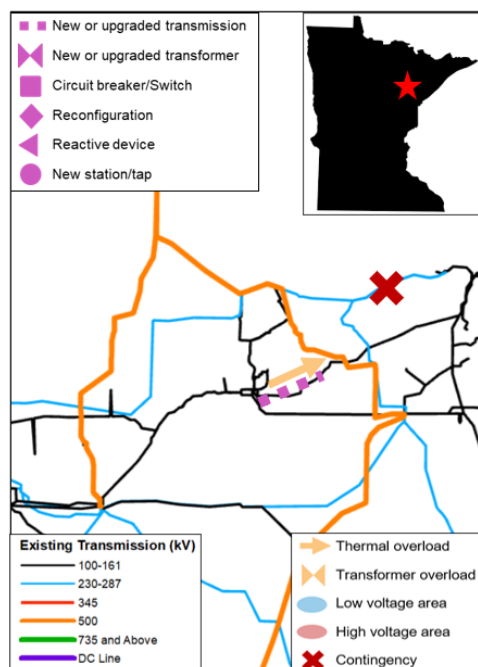
\$83M ³

\$18M ⁵

● Other ● BRP

Baseline Reliability Projects

25267 – 180 Line Rebuild



Submitting TO	MINNESOTA POWER INC.
Project #	25267
Project Name	180 Line Rebuild
Project Type	BRP
Project Description	Rebuild 115kV 180 Line (Hibbing -Maturi) with 636 ACSR.
System Need	180 Line rebuild project is needed for its age and condition as well as to increase capacity to mitigate P6 overloads.
Current Cost	\$10M
Expected ISD	12/31/2028
Target Appendix	A

Figure 4.6.10-1: P25267 Geographic transmission map of project area and MTEP Portal project details.



Project Justification: For NERC defined P6 contingency events, [MP] Hibbing – [MP] Maturi 115 kV line experiences thermal violations beyond its emergency limits in 2030 SHAW, 2030 SUM, and 2035 SUM cases. 180 Line Rebuild project will resolve the thermal violation.

Cont. Type	Limiting Element	Pre-Project (post-cont.) Loading (%)	Post-Project (post-cont.) Loading (%)
P6	[MP] Hibbing – [MP] Keewatin Tap 115 kV	112	34
P6	[MP] Maturi – [MP] Keewatin Tap 115 kV	109	33

Table 4.6.10-1: P25267 Thermal loading drivers.

50149 – Arrowhead 230 kV SPF (Single Point of Failure) Upgrade

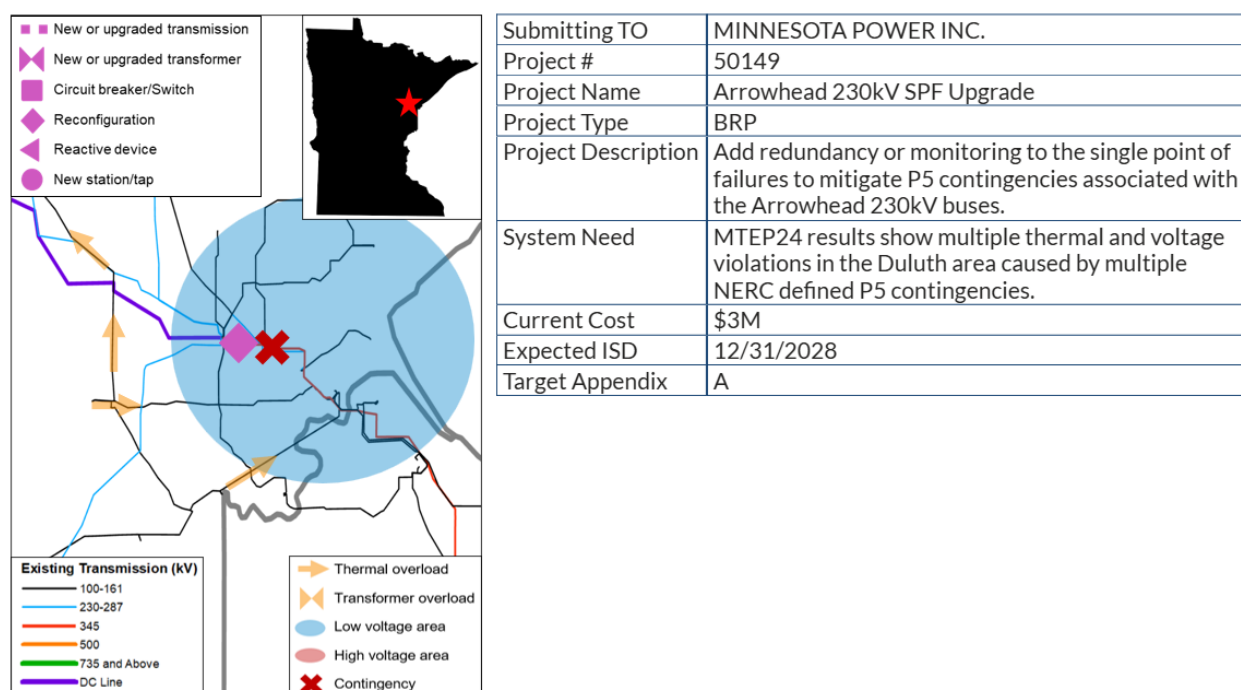


Figure 4.6.10-2: P50149 Geographic transmission map of project area and MTEP Portal project details.

Project Justification: For NERC defined category P5 contingency event, multiple buses experience voltages below their emergency limits in 2030 summer peak, 2030 winter peak and 2035 summer peak cases. Additionally, several BES elements experience thermal violations beyond their emergency limits. Arrowhead 230 kV SPF Upgrade project will eliminate the P5 contingency, hence enhancing the reliability.



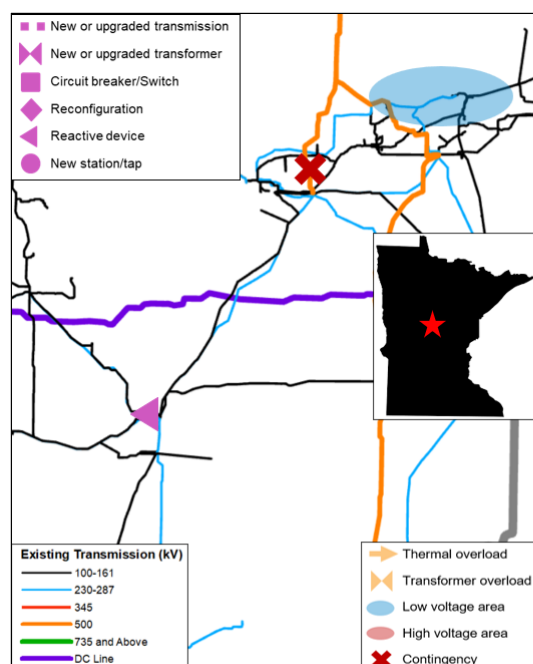
Cont. Type	Limiting Element	Pre-Project (post-cont.) Loading (%)	Post-Project (post-cont.) Loading (%)
P5	[MP] Floodwood Tap 7 – [MP] Meadowlands 115 kV	125	Contingency has been eliminated, so thermal violation is no longer present

Table 4.6.10-2: P50149 Thermal loading drivers.

Cont. Type	Limiting Element	Voltage Threshold (pu)	Pre-Project (post-cont.) Voltage (pu)	Post-Project (post-cont.) Voltage (pu)
P5	[MP] Haines Road 115 kV	0.95	0.846	Contingency has been eliminated, so voltage violation is no longer present

Table 4.6.10-3: P50149 Voltage loading drivers.

50218 – Riverton STATCOM



Submitting TO	MINNESOTA POWER INC.
Project #	50218
Project Name	Riverton STATCOM
Project Type	BRP
Project Description	Placing a +/- 300 MVAR STATOM at the Riverton 230 kV Substation
System Need	Providing dynamic voltage support with moving baseload generation to economic dispatch
Current Cost	\$70M
Expected ISD	3/31/2028
Target Appendix	A

Figure 4.6.10-3: P50218 Geographic transmission map of project area and MTEP Portal project details.



Project Justification: When no large conventional generation is online in Northern Minnesota, and for several NERC defined events, multiple buses can experience voltages below their transient limits. Riverton STATCOM project will help maintain the voltage under dynamic conditions.

Cont. Type	Limiting Element	Transient Voltage Threshold (pu)	Pre-Project (post-cont.) Voltage (pu)	Post-Project (post-cont.) Voltage (pu)
Extreme	[MP] Minntac 115 kV	0.70	0.69	0.71

Table 4.6.10-4: P50218 Voltage loading drivers.

Other Projects

Project ID	Project Name	Other Breakdown	ISD	Estimated Cost (\$M)
25264	Ridgeview Transformer Addition	Local Needs	12/31/2027	\$2.0
50365	Shannon Capacitor Bank Replacement	Age and Condition	12/31/2026	\$1.8
50393	Iron Range 500 kV Reactor Addition	Local Reliability	12/31/2030	\$4.0
50395	Transmission Line Pole Replacement 2025	Age and Condition	12/31/2025	\$8.3
50402	Boswell 115/23 kV Transformer Addition	Local Needs	12/31/2026	\$1.6

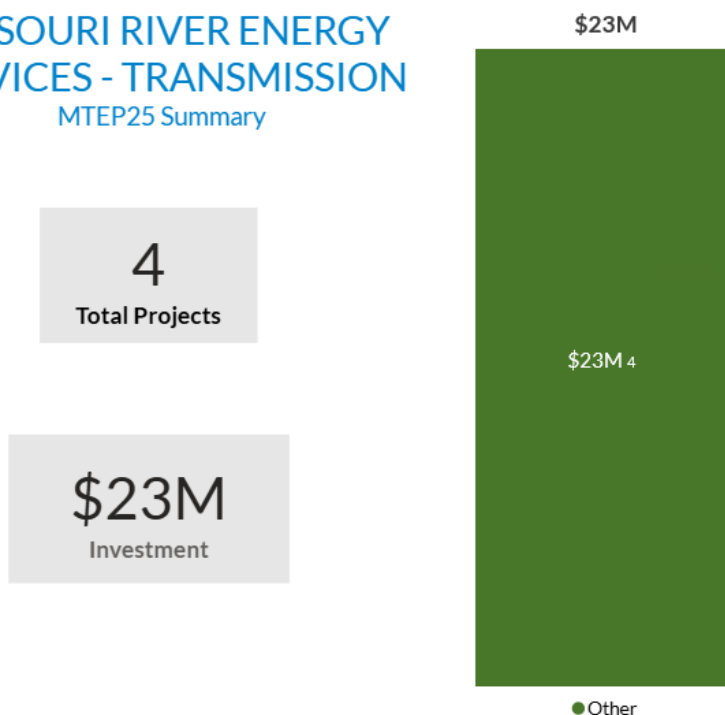
4.6.11 Minnkota Power Cooperative (MPC)

Minnkota Power Cooperative and MISO are not recommending any new projects for MTEP25.



4.6.12 Missouri River Energy Services (MRES)

MISSOURI RIVER ENERGY SERVICES - TRANSMISSION MTEP25 Summary



Other Projects

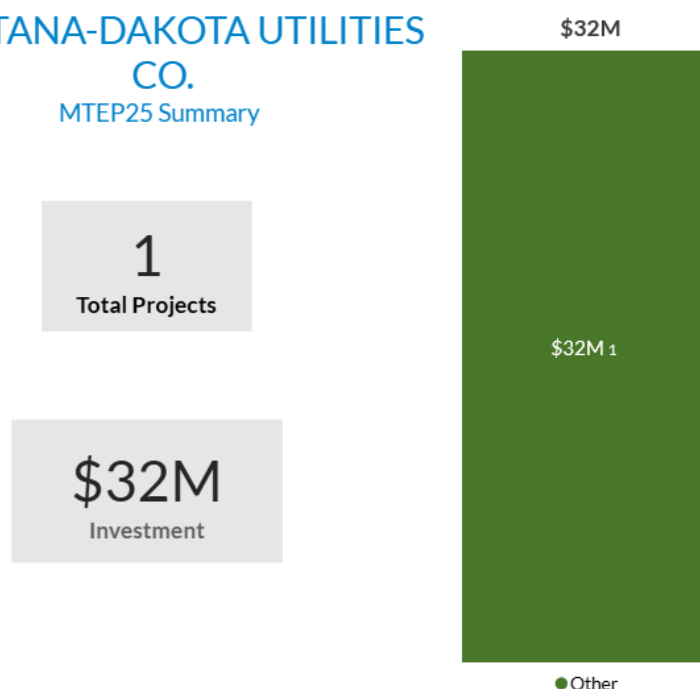
Project ID	Project Name	Other Breakdown	ISD	Estimated Cost (\$M)
50464	Erie Road Substation Rebuild	Age and Condition	1/1/2029	\$4.5
50465	Pella Underground Conversion	Local Needs	1/1/2026	\$0.5
50483	St. John's Lake Breaker Station	Local Reliability	12/30/2029	\$9.0
50484	Priam Second Transformer	Local Reliability	12/30/2029	\$9.0



4.6.13 Montana-Dakota Utilities Co. (MDU)

MONTANA-DAKOTA UTILITIES CO.

MTEP25 Summary



Other Projects

Project ID	Project Name	Other Breakdown	ISD	Estimated Cost (\$M)
50260	Hettinger-Elgin Rebuild to 115 kV	Age and Condition	12/31/2029	\$32.1

4.6.14 Muscatine Power and Water (MPW)

Muscatine Power and Water and MISO are not recommending any new projects for MTEP25.

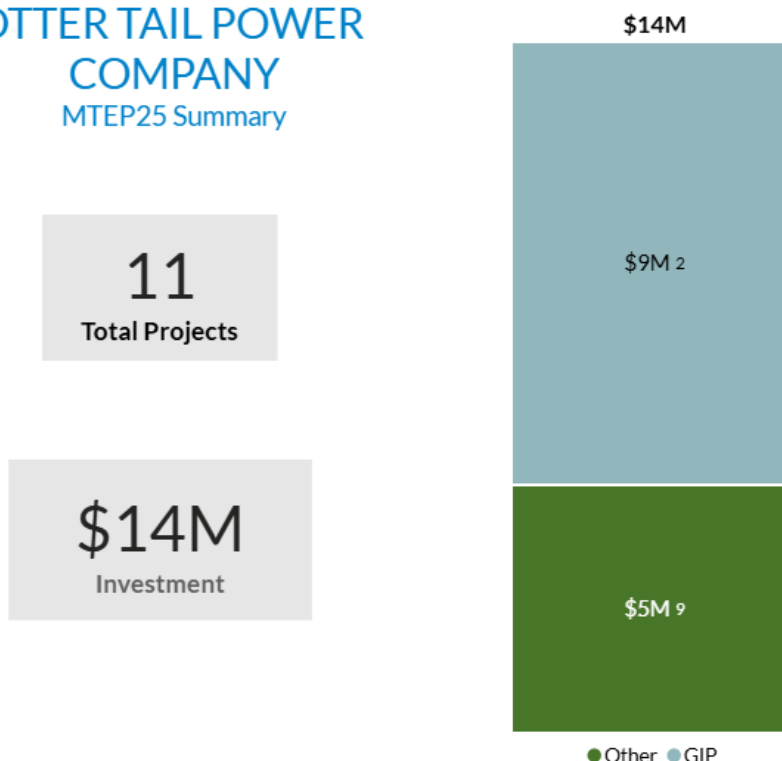
4.6.15 Northwestern Wisconsin Electric (NWECE)

Northwestern Wisconsin Electric and MISO are not recommending any new projects for MTEP25.



4.6.16 Otter Tail Power Company (OTP)

OTTER TAIL POWER COMPANY MTEP25 Summary



Other Projects

Project ID	Project Name	Other Breakdown	ISD	Estimated Cost (\$M)
50467	OTP Maple River Reactor Retirements	Age and Condition	12/31/2025	\$0.0
50469	OTP Big Stone South Reactor Retirement	Age and Condition	12/31/2025	\$0.0
50470	OTP Cyrus - Farwell 41.6 kV Rebuild	Age and Condition	12/31/2025	\$1.1
50471	OTP Ivanhoe 41.6 kV Line Recloser	Local Reliability	12/31/2025	\$0.4
50485	OTP Eden - Grenville 41.6 kV Rebuild	Age and Condition	12/31/2029	\$1.4
50486	OTP Casselton Town New 115 kV Delivery	Local Reliability	12/31/2026	\$1.0
50487	OTP Bemidji Nymore Circuit Breaker	Local Reliability	12/31/2026	\$0.4
50510	OTP Bellingham 115 kV Delivery	Age and Condition	12/31/2030	\$0.7
*50603	OTP Big Stone South Load Addition	Load Growth	9/19/2025	\$0.0

* Project studied through Expedited Project Review (EPR) process.



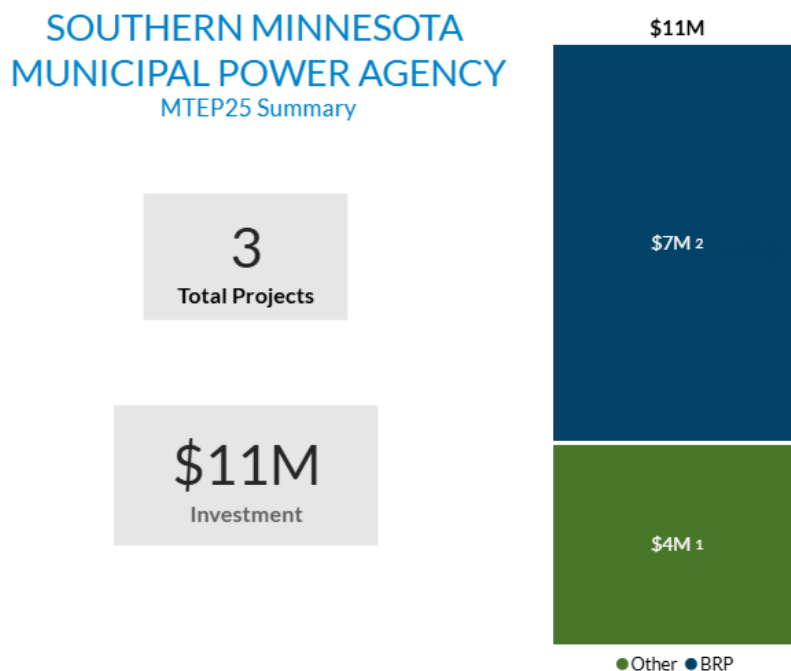
Generator Interconnection Projects

Project ID	Project Name	ISD	Estimated Cost (\$M)
50520	OTP Donaldson - Donaldson South J1575 Network Upgrades	12/31/2028	\$0.8
50521	OTP Donaldson South J1575 Interconnection	8/3/2028	\$8.1

4.6.17 Rochester Public Utilities (RPU)

Rochester Public Utilities and MISO are not recommending any new projects for MTEP25.

4.6.18 Southern Minnesota Municipal Power Agency (SMMPA)





Baseline Reliability Projects

50153 – Owatonna 161 kV Cap Bank Addition

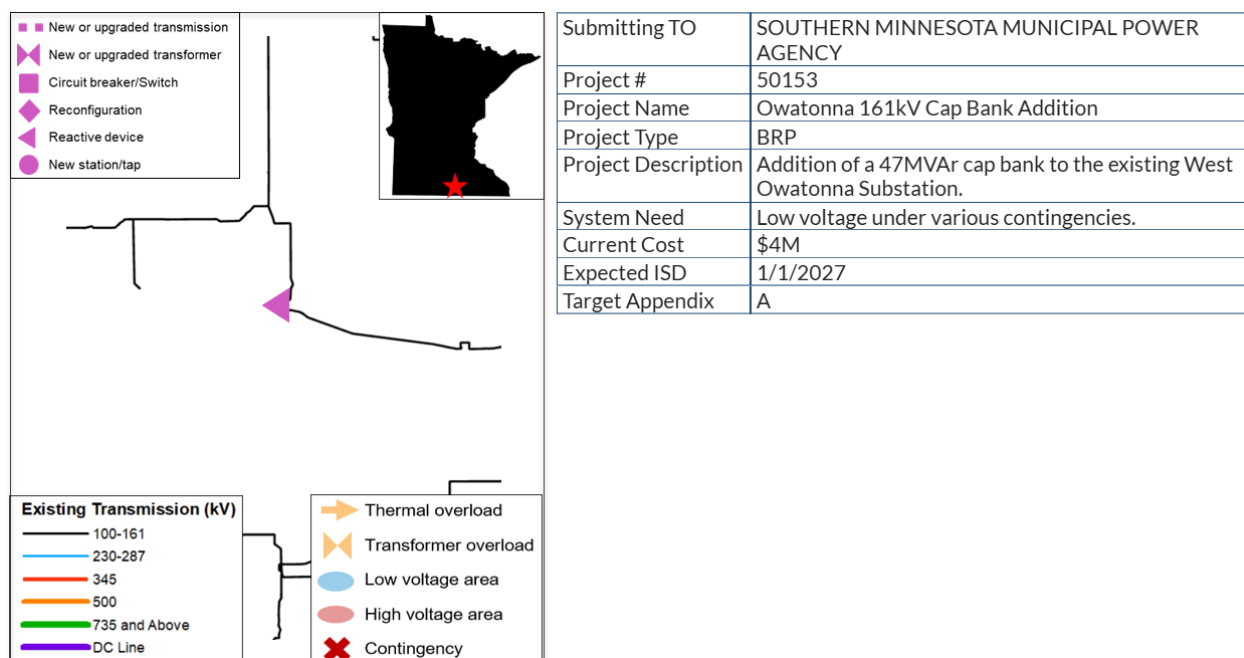


Figure 4.6.18-1: P50153 Geographic transmission map of project area and MTEP Portal project details.

Project Justification: Installing a 47 MVAR capacitor bank at the West Owatonna Substation will mitigate low voltage conditions observed under multiple contingencies in the Owatonna area.

Cont. Type	Limiting Element	Voltage Threshold (pu)	Pre-Project (post-cont.) Voltage (pu)	Post-Project (post-cont.) Voltage (pu)
P6	[SMMPA] Owatonna Downtown 69 kV	0.90	0.8462	0.9758
P6	[SMMPA] Loon Lake Sub 69 kV	0.90	0.8285	0.9665
P6	[SMMPA] West Owatonna Sub 69 kV	0.90	0.8462	0.9758
P6	[SMMPA] Owatonna Downtown 69 kV	0.90	0.8462	0.9758

Table 4.6.18-1: P50153 Voltage loading drivers.



50501 – Byron – Pleasant Valley 161 kV Terminal Upgrade

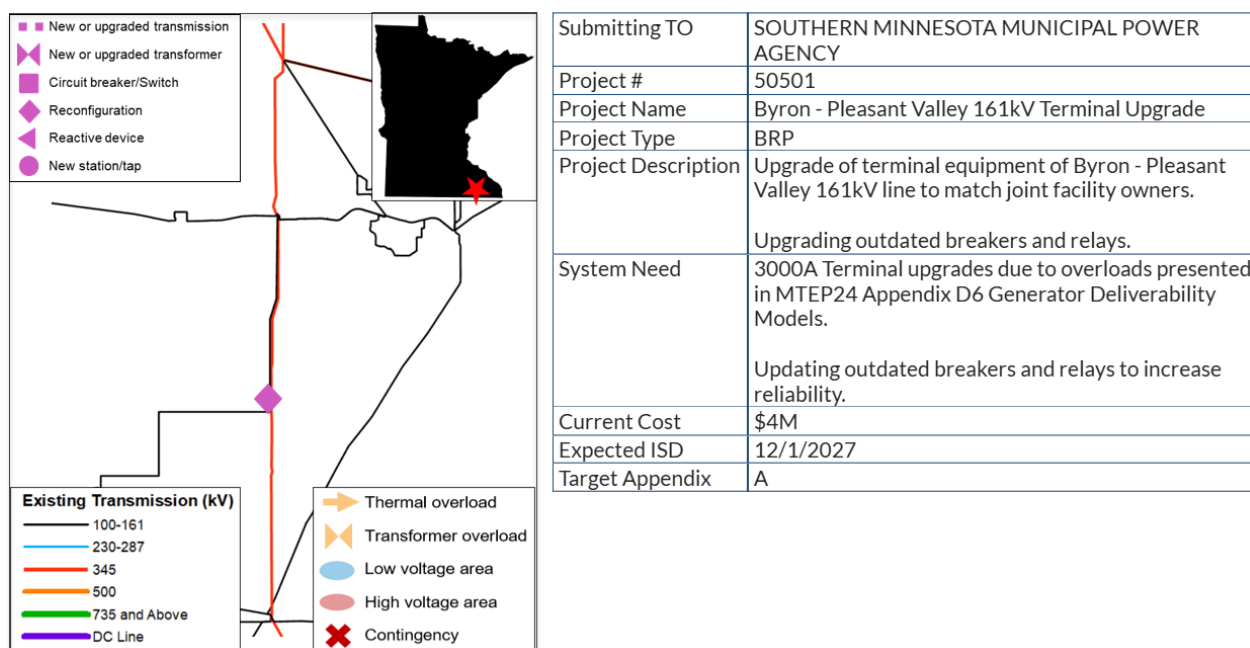


Figure 4.6.18-2: P50501 Geographic transmission map of project area and MTEP Portal project details.

Other Projects

Project ID	Project Name	Other Breakdown	ISD	Estimated Cost (\$M)
50498	Byron - Cascade Creek Line Relocation	Local Needs	12/31/2026	\$3.6

4.6.19 Wilmar Municipal Utilities (WMU)

Willmar Municipal Utilities and MISO are not recommending any new projects for MTEP25.

4.6.20 WPPI Energy (WPPI)

WPPI Energy and MISO are not recommending any new projects for MTEP25.



4.6.21 Xcel Energy (Northern States Power)

NORTHERN STATES POWER COMPANY MTEP25 Summary

40

Total Projects

\$627M

Investment

\$627M

\$92M 1

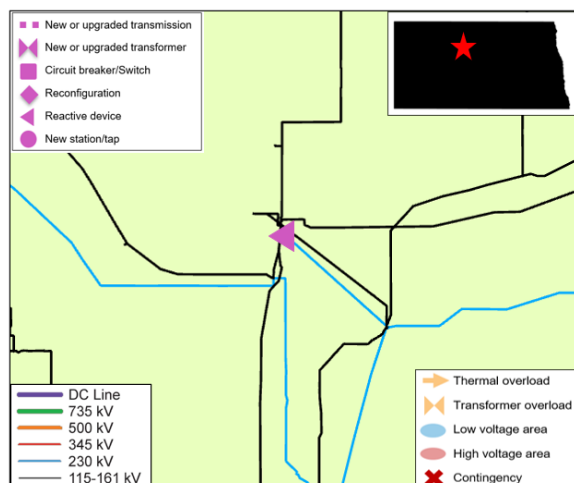
\$12M 3

\$523M 36

Other BRP MVP

Baseline Reliability Projects

50451 – Magic City Reactor



Submitting TO	NORTHERN STATES POWER COMPANY
Project #	50451
Project Name	Magic City Reactor
Project Type	BRP
Project Description	Install new reactor at Magic City
System Need	Remediates observed high voltages under FAC-011 required monitoring
Current Cost	\$1M
Expected ISD	9/1/2028
Target Appendix	A

Figure 4.6.21-1: P50451 Geographic transmission map of project area and MTEP Portal project details.

Project Justification: High voltage violations are observed under a wide variety of N-1-1 contingencies in light load MTEP models across north-central and northeastern North Dakota.

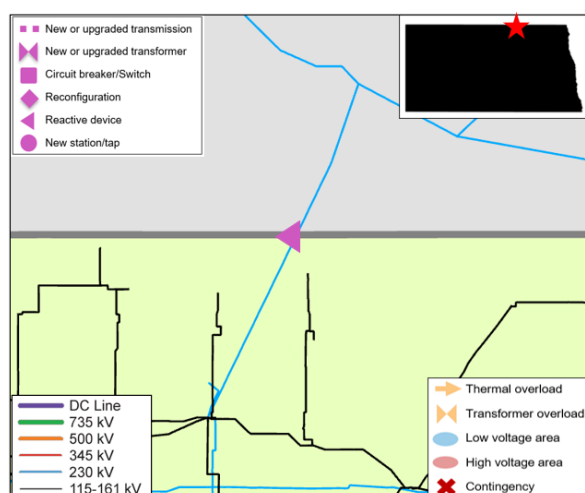


NSP's reactor BRPs (including the Magic City Reactor) provide additional voltage support to resolve these high voltage issues, primarily at [GRE] Ramsey 230 kV and [GRE] Balta 230 kV.

Cont. Type	Limiting Element	Voltage Threshold (pu)	Pre-Project (post-cont.) Voltage (pu)	Post-Project (post-cont.) Voltage (pu)
P6	[GRE] Ramsey 230 kV	1.05	1.0727	1.0438
P6	[GRE] Balta 230 kV	1.05	1.0753	1.0370

Table 4.6.21-1: P50451 Voltage loading drivers.

50452 – Peace Garden Reactor



Submitting TO	NORTHERN STATES POWER COMPANY
Project #	50452
Project Name	Peace Garden Reactor
Project Type	BRP
Project Description	Install new reactor at Peace Garden
System Need	Remediates observed high voltages under FAC-011 required monitoring
Current Cost	\$2M
Expected ISD	12/1/2027
Target Appendix	A

Figure 4.6.21-2: P50452 Geographic transmission map of project area and MTEP Portal project details.

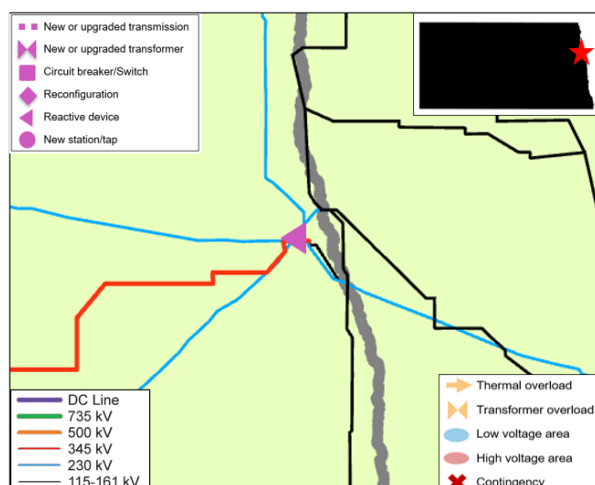
Project Justification: High voltage violations are observed under a wide variety of N-1-1 contingencies in light load MTEP models across north-central and northeastern North Dakota. NSP's reactor BRPs (including the Peace Garden Reactor) provide additional voltage support to resolve these high voltage issues, primarily at [GRE] Ramsey 230 kV and [GRE] Balta 230 kV.

Cont. Type	Limiting Element	Voltage Threshold (pu)	Pre-Project (post-cont.) Voltage (pu)	Post-Project (post-cont.) Voltage (pu)
P6	[GRE] Ramsey 230 kV	1.05	1.0727	1.0438
P6	[GRE] Balta 230 kV	1.05	1.0753	1.0370

Table 4.6.21-2: P50452 Voltage loading drivers.



50455 – Prairie Reactor



Submitting TO	NORTHERN STATES POWER COMPANY
Project #	50455
Project Name	Prairie Reactor
Project Type	BRP
Project Description	Install new reactor and substation upgrades to accommodate new reactor at Prairie.
System Need	Remediates observed high voltages under FAC-011 required monitoring
Current Cost	\$10M
Expected ISD	1/1/2029
Target Appendix	A

Figure 4.6.21-3: P50455 Geographic transmission map of project area and MTEP Portal project details.

Project Justification: High voltage violations are observed under a wide variety of N-1-1 contingencies in light load MTEP models across north-central and northeastern North Dakota. NSP's reactor BRPs (including the Prairie Reactor) provide additional voltage support to resolve these high voltage issues, primarily at [GRE] Ramsey 230 kV and [GRE] Balta 230 kV.

Cont. Type	Limiting Element	Voltage Threshold (pu)	Pre-Project (post-cont.) Voltage (pu)	Post-Project (post-cont.) Voltage (pu)
P6	[GRE] Ramsey 230 kV	1.05	1.0727	1.0438
P6	[GRE] Balta 230 kV	1.05	1.0753	1.0370

Table 4.6.21-3: P50455 Voltage loading drivers.

Other Projects

Project ID	Project Name	Other Breakdown	ISD	Estimated Cost (\$M)
25371	Lake Yankton SVC Retirement	Age and Condition	12/1/2025	\$0.7
50398	Install Inver Hills TRs and Feeders	Local Reliability	12/15/2028	\$35.1
50417	Rebuild 0735 St Bonifacius to Mound	Age and Condition	12/31/2026	\$13.2
50421	Rebuild 0737 Gleason Lake to Mound	Age and Condition	3/15/2028	\$13.0
50422	Coon Creek Breaker ELR	Local Reliability	12/1/2025	\$2.3
50423	Essig Substation Rebuild	Age and Condition	8/31/2027	\$0.7
50424	Maple Street Substation	Load Growth	6/1/2027	\$13.0



Project ID	Project Name	Other Breakdown	ISD	Estimated Cost (\$M)
50426	Thunder Substation	Load Growth	10/15/2027	\$7.3
50428	Replace Cass County TR1	Load Growth	6/1/2028	\$12.2
50429	West Byron TR 2	Load Growth	10/15/2026	\$7.5
50430	Souris Upgrades	Local Reliability	5/31/2028	\$2.0
50431	Line 0846 Relocation	Local Needs	12/1/2024	\$0.2
50433	Install Pine Island Island Area Substation	Load Growth	12/30/2026	\$8.9
50434	Replace Meire Grove TR1	Load Growth	5/3/2027	\$6.2
50435	Install East Mankato Area Substation	Load Growth	12/31/2027	\$6.7
50436	rebuild W3449 Marshland to Mississippi River	Age and Condition	12/15/2027	\$7.8
50437	Horseshoe Lake Substation	Local Reliability	1/1/2027	\$8.5
50438	Line 0955 Relocation	Local Needs	4/30/2025	\$1.9
50440	West Maple Grove Substation	Load Growth	9/1/2028	\$25.0
50442	Rebuild 5400 Richmond to Rich Springs Tap	Age and Condition	12/29/2028	\$2.4
50443	Monroe County Breaker and Transformer EOL Replacement	Age and Condition	12/1/2028	\$8.0
50445	Sioux Falls 115 kV Conversion	Load Growth	6/1/2029	\$60.0
50449	Roughrider Substation	Load Growth	10/15/2029	\$7.5
50450	Upgrade end of life Wilmarth TR7 and TR8	Age and Condition	12/31/2028	\$5.0
50453	Prairie Island Breaker Addition	Local Reliability	12/1/2028	\$3.0
50454	Line 0730 Souris - West Sioux Falls Rebuild	Age and Condition	9/1/2025	\$1.0
50456	Fort Ridgely 69 kV Rebuild	Local Reliability	1/1/2029	\$14.0
50457	Install Montrose TR2	Load Growth	12/31/2026	\$7.5
50458	Install Avon Area Substation	Load Growth	12/31/2027	\$10.0
50459	Install Stewart TR2	Load Growth	12/31/2027	\$15.0
50460	Prairie Island TR10 Replacement	Age and Condition	12/1/2031	\$8.0
50461	Line 0868 Le Sauk - Fischer Hills - St Stephens Rebuild	Age and Condition	1/1/2029	\$12.2
50489	Split Rock - Chanarambie 345 kV line JTIQ	Local Needs	6/30/2033	\$165.0



Project ID	Project Name	Other Breakdown	ISD	Estimated Cost (\$M)
50494	Knight Substation	Load Growth	12/1/2026	\$0.03
50500	Byron - Pleasant Valley 161 kV Line Upgrade	Local Needs	6/1/2029	\$20.0
50720	Fargo-St. Cloud-Monticello 345 kV Davit Arm Replacement	Age and Condition	9/30/2030	\$12.5

50489 – Split Rock – Chanarambie 345kV line JTIQ

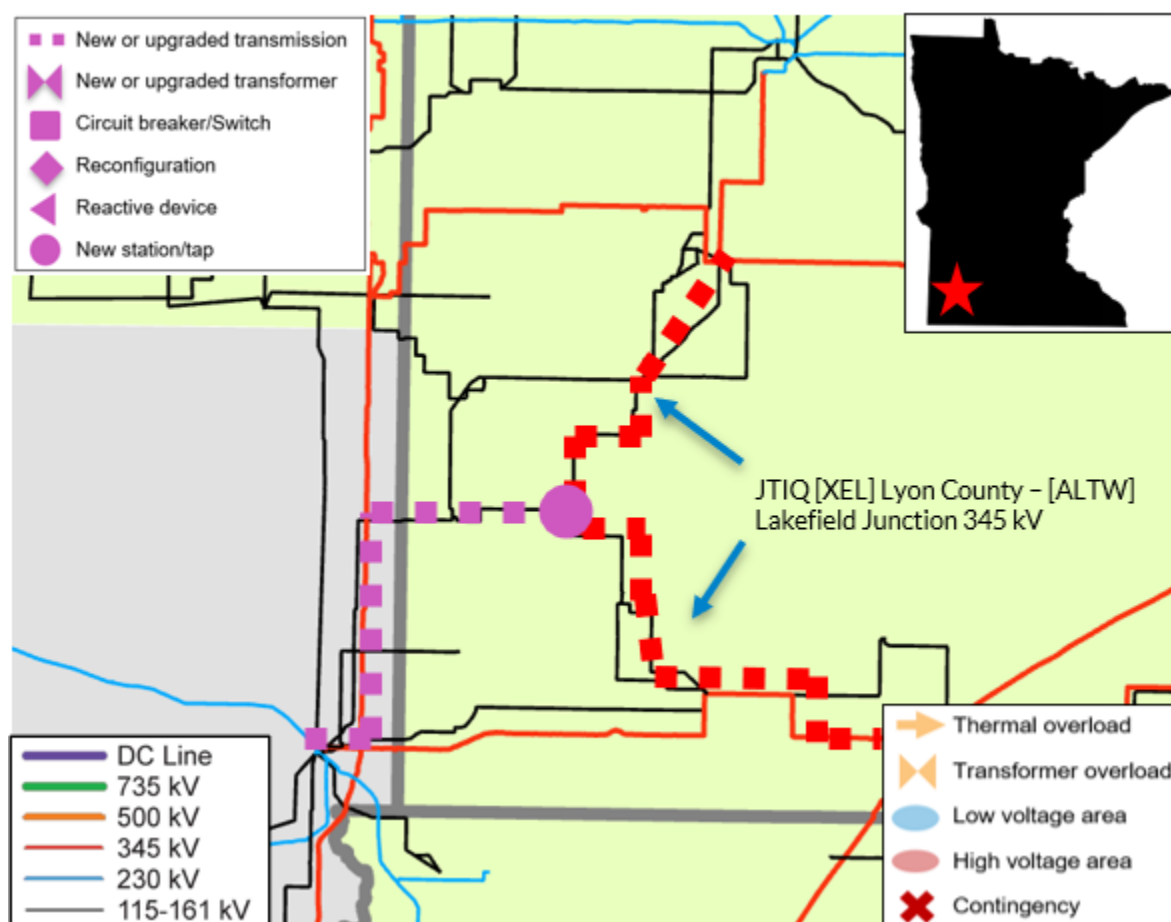


Figure 4.6.21-4: P50489 Geographic transmission map of project area.

Project taps JTIQ line [XEL] Lyon County – [ALTW] Lakefield 345 kV and routes into new 345 kV substation at Chanarambie. A new 345 kV line is constructed from [XEL] Chanarambie 345 kV to [XEL] Split Rock 345 kV. The 115 kV line between [XEL] Split Rock and [XEL] Chanarambie is also upgraded. This project resolves stability and congestion issues in southern Minnesota, supports load serving in the Sioux Falls area, and relieves generation deliverability issues identified in MTEP24.



Multi-Value Projects

Project ID	Project Name	ISD	Estimated Cost (\$M)
50711	Brookings County – Lyon County 345 kV Davit Arm Replacement	9/30/2030	\$91.9

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