Appendix D1

Central

2016

Ameren

Big Rivers Electric Corp. (BREC)

City of Columbia, Missouri (CWLD)

City Water, Light & Power (CWLP)

Duke Energy Indiana (DEI)

Hoosier Energy (HE)

Indiana Municipal Power Agency (IMPA)

Indiana Power and Light Co. (IPL)

Prairie Power Inc. (PPI)

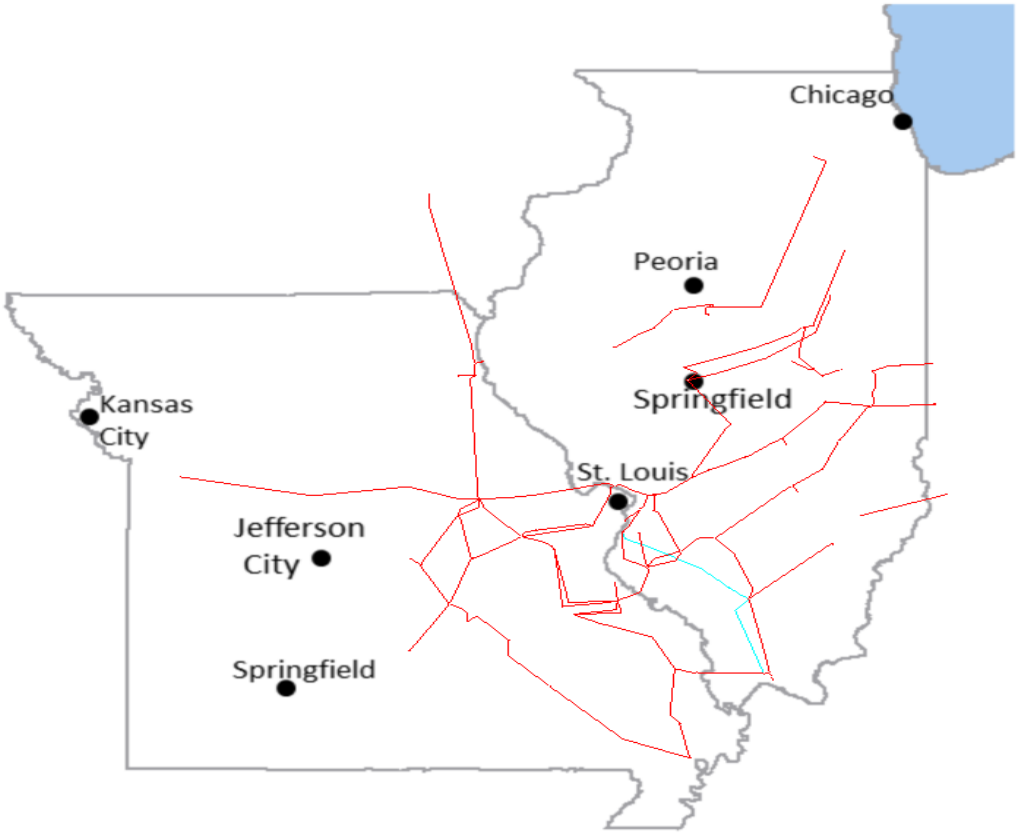
Southern Illinois Power Cooperative (SIPC)

Vectren (SIGE)

Wabash Valley Power (WVPA)

Appendix D1: Central Region

Missouri and Illinois



Appendix D1: Missouri/Illinois Planning Region

Illinois Regional Information

The MISO Central planning region consists of four Transmission Owners in Illinois: Ameren Illinois (AMIL), Southern Illinois Power Cooperative (SIPC), Prairie Power Inc. (PPI), and City Water, Light and Power (CWLP). The Bulk Power System (BPS) within the state of Illinois consists of an extensive 345 kV, 230 kV, 161 kV, and 138 kV networked transmission system. The 345 kV network spans Illinois both north to south and east to west. The 161 kV and 138 kV networks span both north and south and east to west. All of AMIL, SIPC, CWLP and PPI belong entirely in the SERC Reliability Corp. region.

AMIL is a regulated electric and gas delivery company based in Collinsville, IL. Its parent company is Ameren Corp., located in St. Louis, Mo. AMIL serves 1.2 million electric customers and 816,000 natural gas customers in central and southern Illinois. Its transmission system includes approximately 4,500 miles of transmission lines, 46,000 miles of distribution lines, 18,200 miles of natural gas pipe-line transmission and distribution mains, and 12 underground natural gas storage fields. AMIL's total generation is about 12,000 MW, more than half of which comes from Dynegy-owned coal units of 5,698 MW and Prairie State Energy-owned coal units of 1,600 MW.

SIPC is a generation and transmission cooperative providing wholesale electric power to seven member distribution cooperatives and two wholesale customers in southern Illinois. Its member cooperatives provide electricity to more than 100,000 end-use customers. SIPC generates around 600 MW from coal fired and natural-gas fired generation plants and owns more than 900 miles of 161 kV, 138 kV and 69 kV transmission lines.

PPI is a member-owned, not-for-profit electric generation and transmission cooperative. PPI produces and supplies wholesale electricity to 10 electric distribution cooperatives in central Illinois. PPI's distribution cooperatives provide retail electric service to approximately 78,000 members within its local service territories. PPI owns and operates approximately 590 miles of transmission lines at 138 kV, 69 kV and 34.5 kV voltage levels. PPI generates 141 MW of oil and gas-fired peaking units and 79 distribution and transmission substations to serve its members.

CWLP is the municipal electric and water utility for Springfield, IL. CWLP's generation capacity is provided by a different fuel mix of generators with a total nameplate capacity of 723 MW. The CWLP electric system's transmission network consists of lines and associated substations operating at voltages of 138 kV and 69 kV. Its 138 kV portion of the transmission network currently includes approximately 63 circuit miles of overhead lines forming a complete loop around the system's service area. The 138 kV transmission lines presently serve nine of the system's substations or switching stations, plus the village of Chatham, IL.

Missouri Regional Information

The MISO central planning region consists of two transmission owners in the state of Missouri: Ameren Missouri (AMMO) and City of Columbia, MO. (CWLD). The BPS within the state of Missouri consists of an extensive 345 kV, 161 kV and 138 kV networked transmission system. The 345 kV network spans Missouri north to south as well as encompassing the St. Louis Metro area. The 161 kV and 138 kV networks span north and south as well as west towards central Missouri. Both Ameren Missouri and CWLD belong entirely in the SERC Reliability Corp. region.

AMMO is part of the St. Louis-based Ameren Corp. with a generating capacity of 10,200 MW. AMMO provides power to serve 1.2 million electric and 130,000 natural gas customers in central and eastern Missouri. Its service area covers 64 counties and more than 500 communities, including the greater St. Louis area. More than half of the AMMO generation comes from Ameren-owned coal and nuclear generation at more than 6,800 MW. Ameren also owns a good percentage of renewables and hydroelectric generation plants across central and eastern Missouri.

CWLD is a customer-owned utility company located in Columbia Missouri. CWLD provides power to serve its nearly 50,000 residents of the City of Columbia, MO., with a peak electric load exceeding 250 MW. Its service area covers the city limits of Columbia. Its transmission system consists of 900 miles of both overhead and underground 161 kV and 69 kV network transmission system. The majority of Columbia's electricity comes from electric producers outside of Columbia.

All the major reliability issues identified within Illinois or Missouri by the independent assessment from MISO have been addressed by projects submitted by the corresponding MISO Central Region Transmission Owners. Figure P-1 shows a geographic map of a portion of the MISO Central Region, Missouri and Illinois, along with a mark for each project recommended to the MISO Board of Directors for approval as part of the MTEP16 plan.

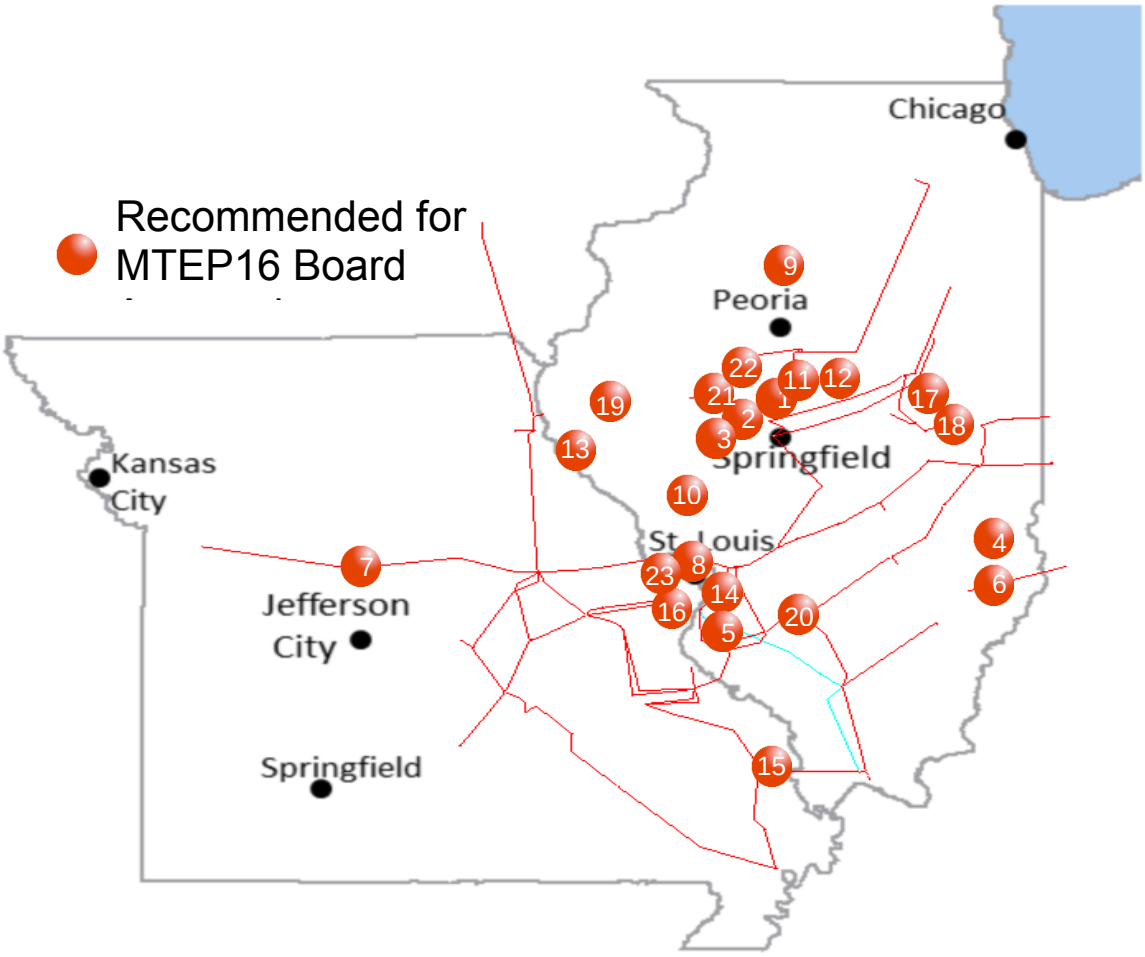


Figure P-1: Geographic map of project area

In Figure P-2, the bar graph represents the estimated cost range for the MTEP16 target Appendix A projects. The green represents projects with a project type for “Other,” whereas the blue represents projects with a project type for Baseline Reliability Project. The Figure P-3, below, represents the estimated in-service dates for each of the Central Region (Missouri and Illinois) MTEP16 target Appendix A projects. The green represents projects with a project type for “Other”, the blue represents projects with a project type for Baseline Reliability Project and the red represents projects with a project type for Market Participant Funded Project (MP). Most of the projects are expected to go into service for this 2016 year, mostly because the number of “Other” project types. These project types are bottom-up projects proposed by our transmission Owning members that are needed for reliability due to age and condition of the system that is being upgraded.

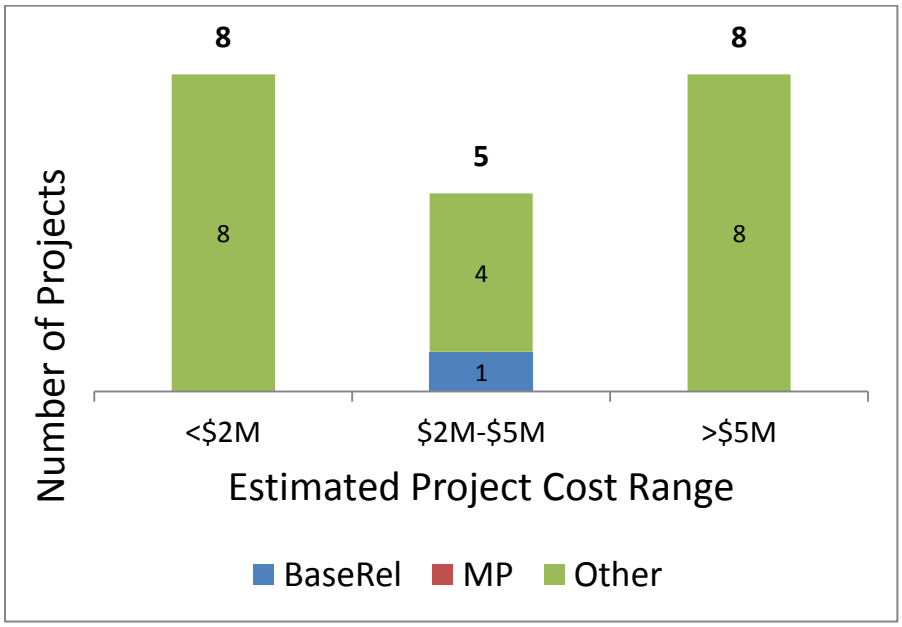


Figure P-2: Graph of Cost Range by Project Type by Project Type

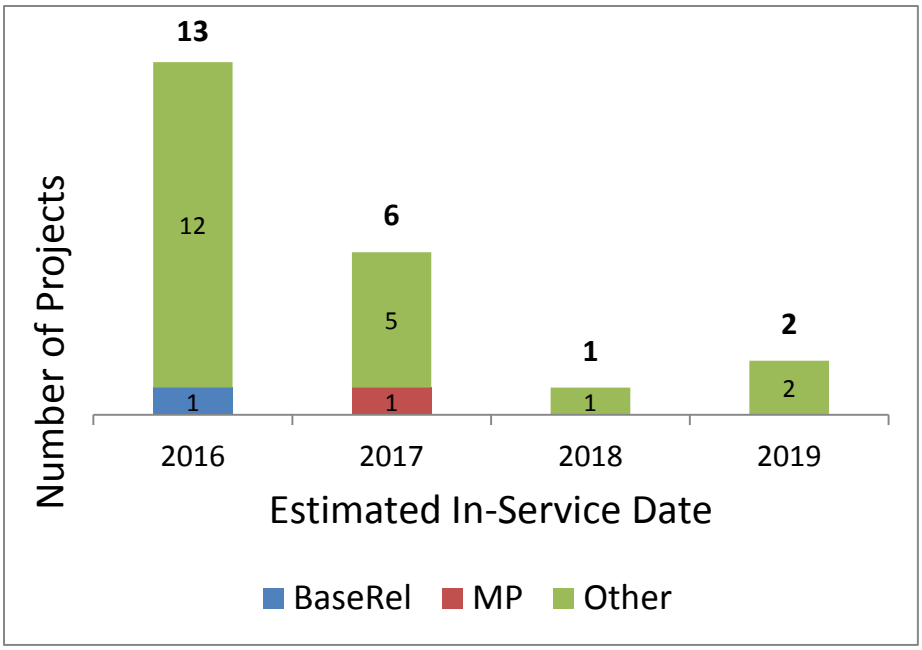


Figure P-3: Graphs of Estimated In-Service Date by Project Type

Ameren Illinois (AMIL)

Overview of Projects

AMIL has a total of 67 projects in the MTEP16 database. Seventeen of these projects are targeting Appendix A; 26 projects are remaining in Appendix for this cycle; and 24 projects are remaining in Appendix B from previous MTEP cycles. Only one project is proposed in Illinois as Baseline Reliability Project (BRP).

Baseline Reliability Project

P10884: Replace the [AMIL] Roxford 345/138 kV transformer

Transmission Owner: Ameren Illinois

Project Area Information

This project is located in Galesburg, IL., and is needed for the [AMIL] Woodriver generation retirement. After the retirement of [AMIL] Woodriver unit, the power flowing through the [AMIL] Roxford 345/138 kV transformer gets overloaded during summer peak season. The existing [AMIL] Roxford 345/138 kV transformer is currently rated at 560 MVA. The replacement transformer will be rated at 700 MVA. This project costs $3.6 million and went into service on June 1, 2016. Figure P10884-1 shows the geographic location of this project. Table P10884-1 shows a comparison of loading of the [AMIL] Roxford 345/138 kV transformer both with and without the [AMIL] Woodriver generation unit online. This helps show the impact that [AMIL] Woodriver generation has on this transformer.

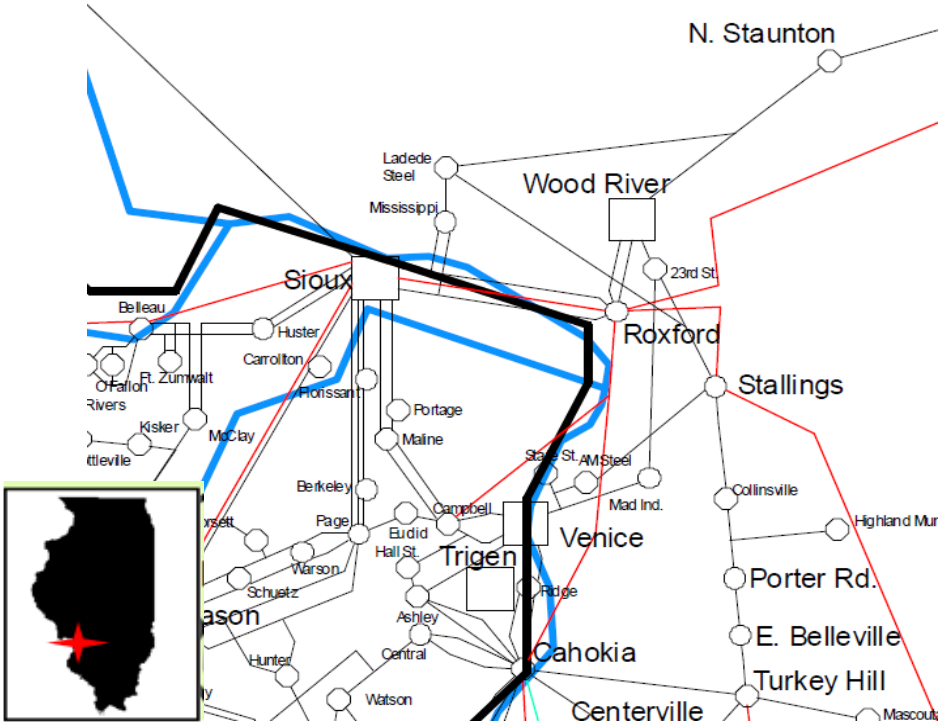


Figure P10884-1: P10884 Geographic area map

Cont. Type	Limiting Element	Rate B (MVA)	Loading w/ Wood River Off (%)	Loading w/ Wood River On (%)
P3	[AMIL] Roxford 345/138 kV transformer	560	102	57
P3	[AMIL] Roxford 345/138 kV transformer	560	106	76
P3	[AMIL] Roxford 345/138 kV transformer	560	101	64
P3-2	[AMIL] Roxford 345/138 kV transformer	560	102	< 85
P3-3	[AMIL] Roxford 345/138 kV transformer	560	106	< 85

Table P10884-1: Project contingency drivers for 2-year-out and 5-year-out models

Project Need

Loss of line and generator would load the [AMIL] Roxford 345/138 kV transformer to 106 percent of its emergency rating.

Alternatives Considered

One project alternative was submitted by PPI to MISO's System Support Resource (SSR) group to construct a new substation near the [AMIL] Woodriver substation and to build a transmission outlet which could mitigate the issue. However, given the lead time for the pending [AMIL] Woodriver generation retirement, this alternative was considered less feasible than the transformer replacement.

Cost Allocation

This is a Baseline Reliability Project, which is not eligible for regional cost sharing.

Other Project Types

P7820: Re-conductor [AMIL] Hennepin-[AMIL] Kewanee 138 kV Line

Transmission Owner: Ameren Illinois

Project Area Information

This project in the Hennepin, IL., area and is driven by age and condition of the existing transmission line. The current rating of the [AMIL] Hennepin—[AMIL] Kewanee 138 kV line is 160 MVA. The re-conductoring of this line will provide an uprate to 255 MVA. This project costs $300,000 and will be in service by June 1, 2017. Figure P7820-1 shows the geographic location of this project.

Project Need

Other, age and condition.

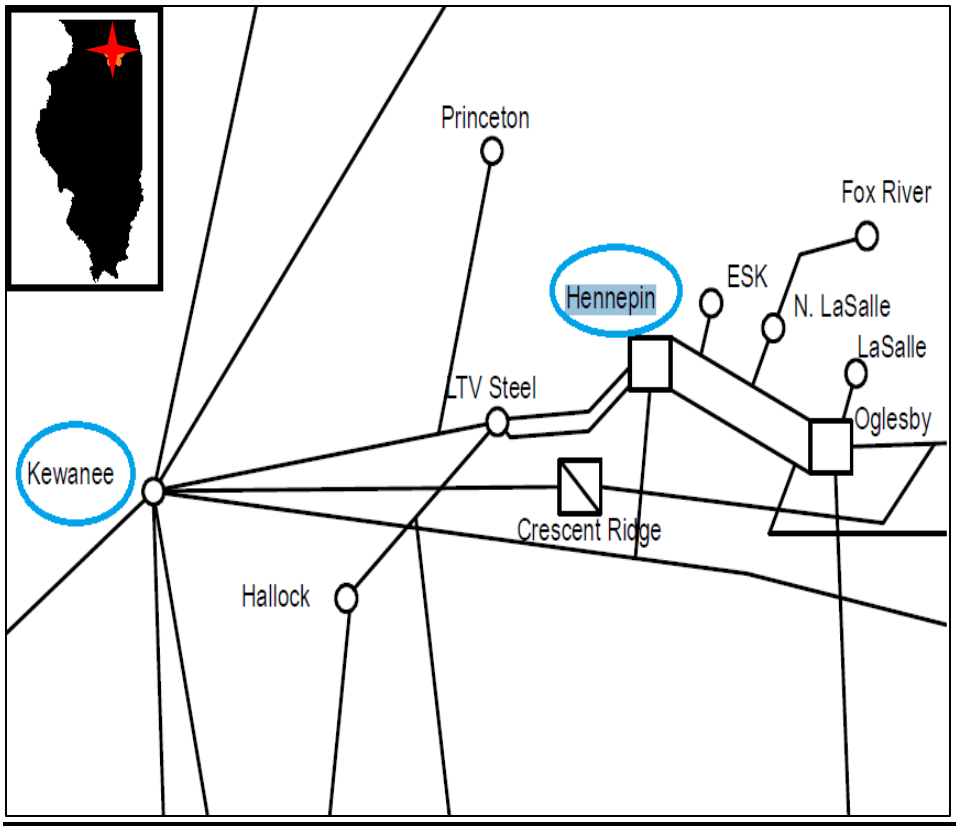


Figure P7820-1: P7820 Geographic area map

Alternatives Considered

No other alternatives were considered.

Cost Allocation

N/A

P9261: New [AMIL] Searitt 138 kV Breaker Station

Transmission Owner: Ameren Illinois

Project Area Information

This project is driven by local load serving need. This project builds a new [AMIL] Searitt 138 kV three-breaker ring bus breaker station and also constructs new [AMIL] Searitt 138/69 kV transformer to serve the load at Enbridge. This project costs $4.5 million and will be in service by December 1, 2017. *Figure P9261-1,* shows the geographic location of this project.

Project Need

Other, Local Load Serving

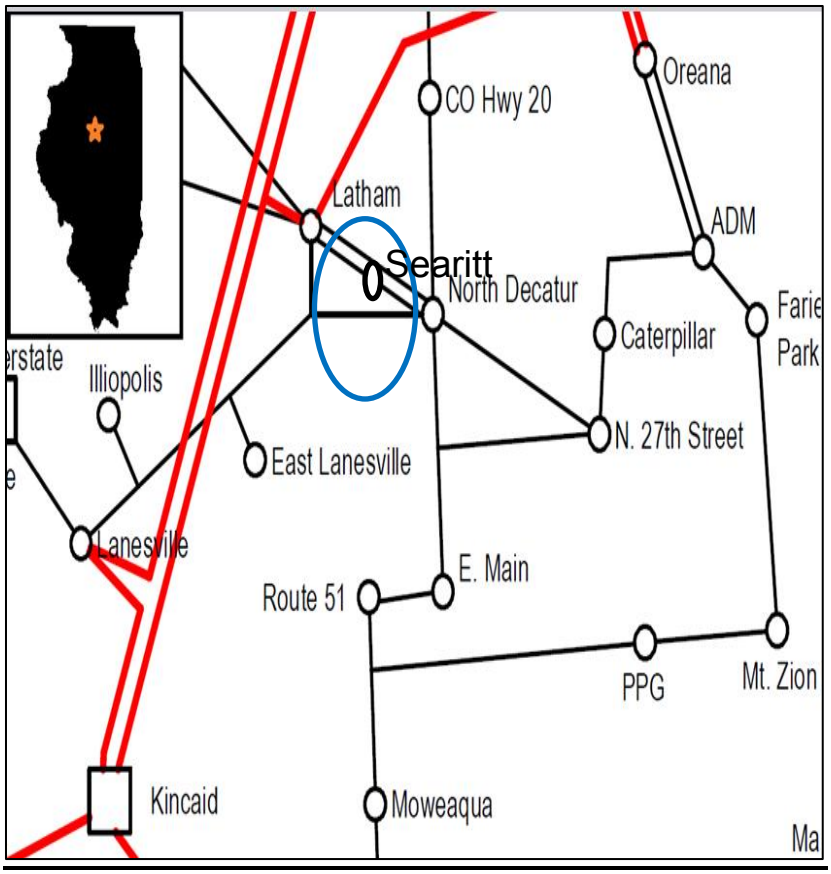


Figure P9261-1: P9261 Geographic area map

Alternatives Considered

No other alternatives were considered.

Cost Allocation

N/A

P9845: New [AMIL] Gallatin 138 kV Ring Bus

Transmission Owners: Ameren Illinois

Project Area Information

This project builds a new [AMIL] Gallatin 138 kV three-breaker ring bus breaker station and also constructs new [AMIL] Gallatin 138/69 kV transformer to serve the load at Gallatin. This project costs $4.5 million and will be in service by December 1, 2017. Figure P9845-1 shows the geographic location of this project.

Project Need

Other, local load Serving

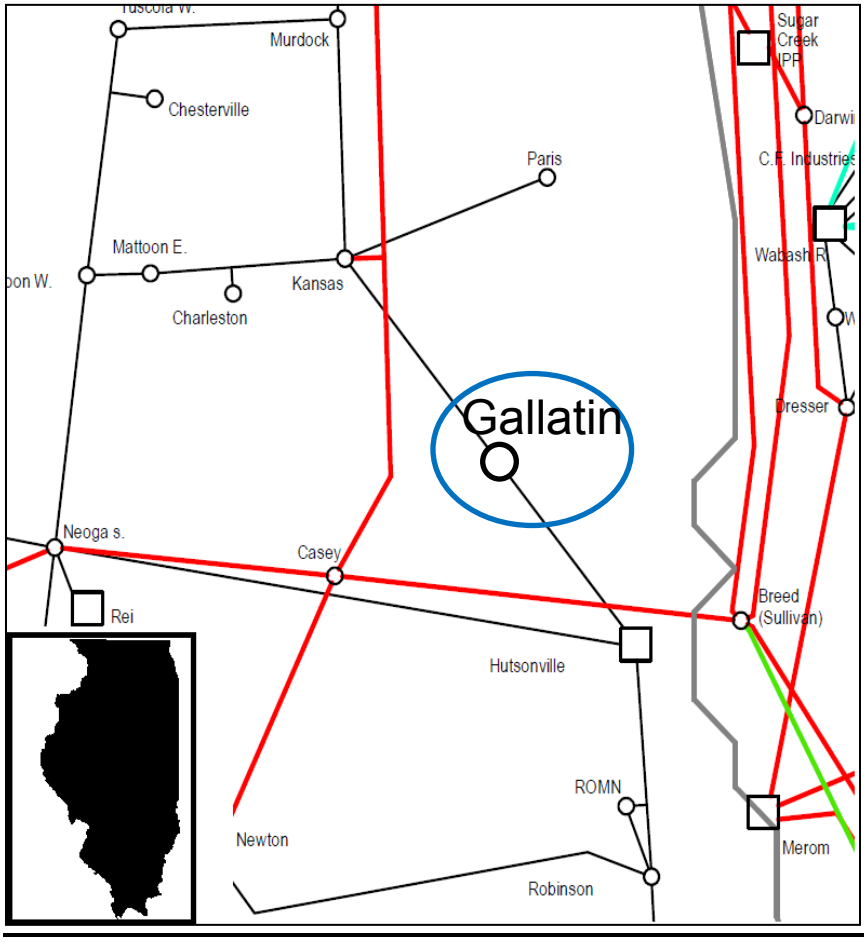


Figure P-7: P9845 Geographic area map

Alternatives Considered

No other alternatives were considered.

Cost Allocation

N/A

Local Load Serving Projects:

These projects are needed to support the local load serving needs. Additionally, they also help for the increased reliability. All projects shown in Table P-2 are needed for age and condition of the current transmission system.

Proj. ID	Project Name	Description	Expected ISD
P3005	Upgrade [AMIL] S. Belleville–[AMIL] Tilden 138 kV terminal equipment	Construct 5-position ring-bus, Build a double Ckt line from Baldwin and S. Belleville-Tilden Tap	6/1/2017
P7869	New [AMIL] Alsey Tap (Ballard) 138 kV breaker station	Install 138 kV breaker station near tap to the [PPI] Alsey Plant on the Jerseyville- Northwest-Meredosia 138 kV line. May be a six-breaker ring bus.	In Service
P9726	New [AMIL] Fogarty 138/34.5 kV distribution transformer connection	Provide 138 kV connection to supply 138/34.5 kV transformer	6/1/2018
P9727	New [AMIL] Wakefield 138 kV substation	Establish 138 kV ring bus; connect to S. Bloomington-Clinton 138 kV line to supply Wakefield Substation	6/1/2019
P9722	Replace [AMIL] Frederick N. 138/69 kV Transformer	Replace existing transformer with 112 MVA unit	10/3/2016
P9873	New [AMIL] Edwards 138/69 kV transformer	New [AMIL] Edwards 138/69 kV transformer	12/1/2017

Table P-2: Age and Condition Projects in Illinois

Alternatives Considered

No other alternatives were considered.

Cost Allocation

N/A

Prairie Power Inc. (PPI)

PPI has a total of three projects in the MTEP16 database. One project is targeting Appendix A in MTEP16 and two projects are remaining in Appendix B.

Other Project Types

P9564: New [PPI] Turris Tap 138 kV Breaker Station

Transmission Owner: Prairie Power Inc.

Project Area Information

This project will construct a new [PPI] Turris Tap 138 kV breaker station, as well as a new [PPI] Turris-[PPI] Athens 138 kV line along with a new [PPI] Athens 138/69 kV distribution substation, and a new [PPI] Athens tap 69 kV switching station. This project costs $16.2 million and is expected to be in-service by December 1, 2020. Figure P9564-1 shows the geographic location of this project.

Project Need

Other, provide alternate feed to support local load.

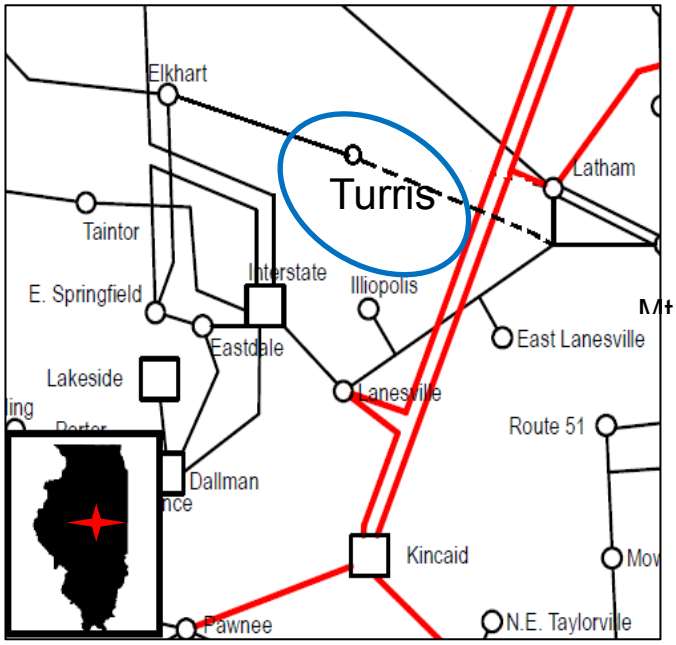


Figure P9564-1: P9564 Geographical Area Map

Alternatives Considered

No other alternatives were considered.

Cost Allocation

N/A

City Water, Light and Power

No projects in MTEP16 database.

Southern Illinois Power Cooperative

No projects in MTEP16 database.

Ameren Missouri (AMMO)

Overview of Projects

AMMO has a total of twenty-three (23) projects in the MTEP16 database. Two (2) projects are targeting Appendix A, Thirteen (13) projects are remaining in Appendix B from MTEP16 cycle, and eight (8) projects are remaining in Appendix B from previous planning cycles. There are currently no BRP projects proposed by Ameren Missouri.

Other Project Types

P10604: Re-conductor [AMMO] Page—[AMMO] Sioux 138 kV line

Transmission Owner: Ameren Missouri

Project Area Information

This project will upgrade the existing 14 miles of 2-300 kcmil copper conductor with 954 kcmil ACSR conductor. This project costs less than $1 million and will be in service by December 1, 2016. Figure P10604-1 shows the geographic location of this project.

Project Need

Other, age and condition

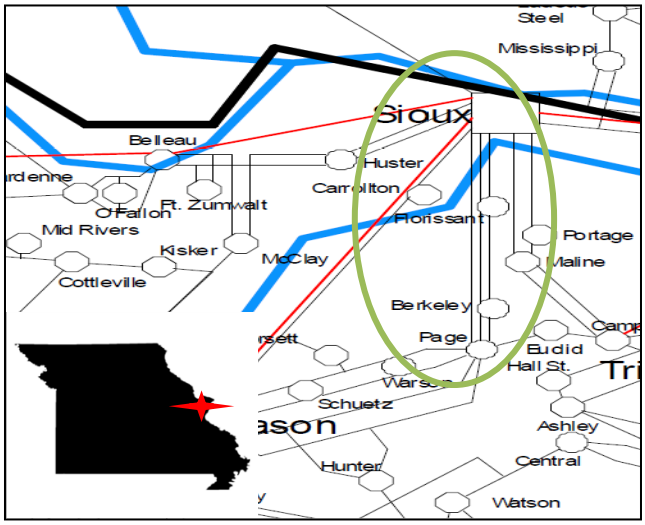


Figure P10604-1: P10604 Geographical Area Map

Alternatives Considered

No other alternatives were considered.

Cost Allocation

N/A

P10483: Upgrade [AMMO] Cape—[AMMO] Kelso—[AMIL] Miner 161 kV lines

Transmission Owner: Ameren Missouri

Project Area Information

This project will increase the ground clearance of two sections of the [AMMO] Cape—[AMMO] Kelso 161 kV line and the [AMMO] Kelso—[AMMO] Miner 161 kV line. This upgrade will permit the operation of this line to 120^0 Celsius. This project costs less than $1 million and will be in service by December 1, 2016. Figure P10482-1 shows the geographic location of this project.

Project Need

Other, age and condition

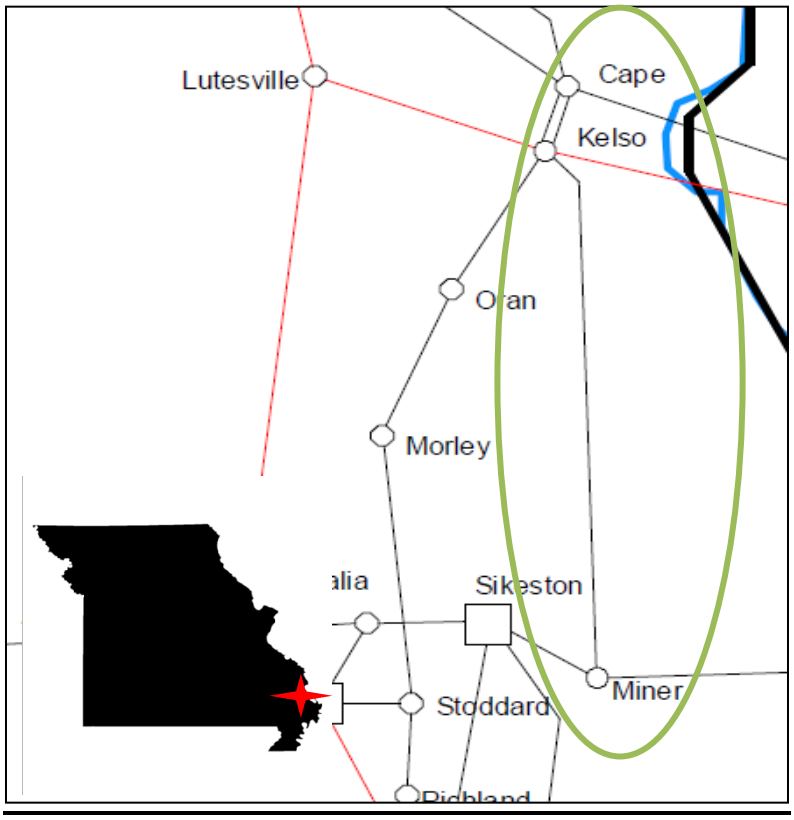


Figure P10483-1: P10483 Geographic Area map

Alternatives Considered

No other alternatives were considered.

Cost Allocation

N/A

City of Columbia, Missouri (CWLD)

Overview of Projects

CWLD has a total of two (2) projects in MTEP16 database. One (1) project is targeting Appendix A and the other project is an MTEP15 approved project but is currently under regulatory delay of construction. Neither project is Baseline Reliability Project (BRP).

Other Project Types

P10162: Upgrade [CWLD] McBaine—[CWLD] McBaine Tap 161 kV line

Transmission Owner: City of Columbia, Missouri

Project Area Information

This project will uprate the [CWLD] McBaine—[CWLD] McBaine Tap 161 kV line to 249 MVA by replacing a switch and wave trap. These line terminal upgrades were requested by Associated Electric Cooperatives Inc. (AECI), a neighboring entity to CWLD and MISO. This project costs less than $1 million and is already in service. Figure P10162-1 shows the geographic location of this project.

Project Need

Other, an AECI reliability needs

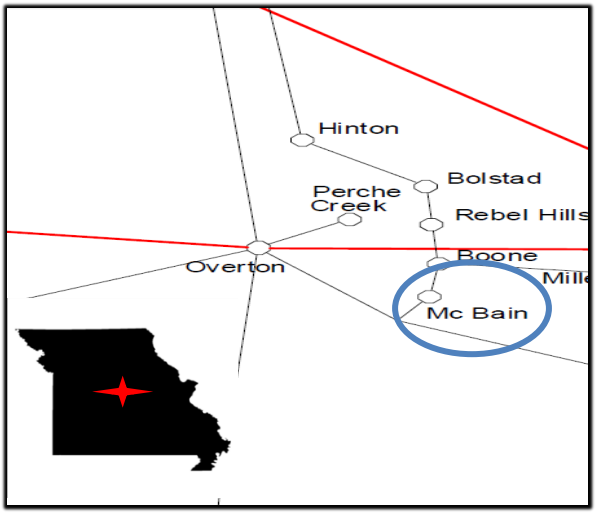


Figure P-11: P10162 Geographic Area map

Alternatives Considered

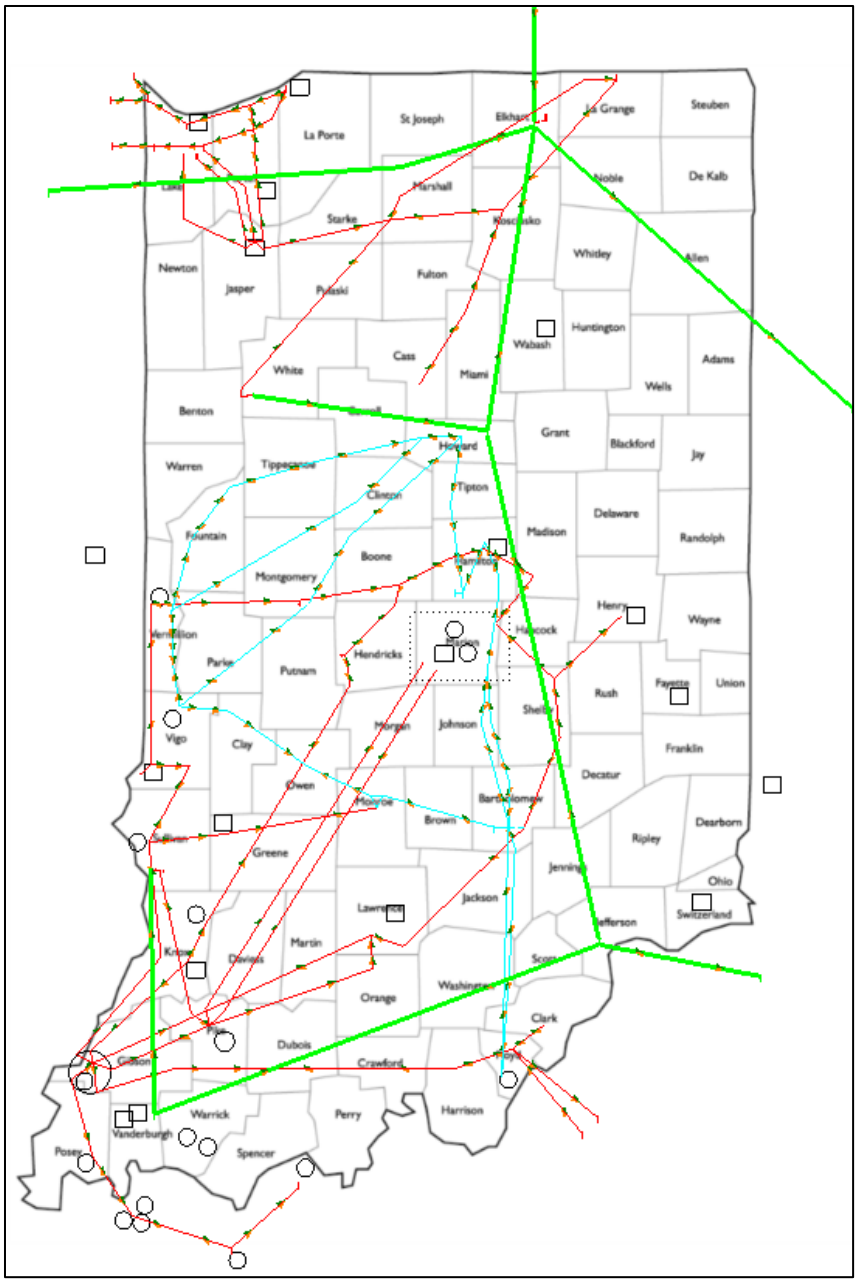
No other alternatives were considered.

Cost Allocation

N/A

Appendix D1: Central Region

Indiana and Kentucky



Indiana/Kentucky Regional Information

The MISO footprint in Indiana and Kentucky includes a total of seven Transmission Owners: Duke Energy Indiana (DEI), Indianapolis Power and Light (IPL), Big Rivers Electric Coop. (BREC), Vectren (SIGE), Hoosier Energy (HE), Wabash Valley Power (WVPA), and Indiana Municipal Power Agency (IMPA).

Major load pockets in Indiana include Marion County and Tippecanoe County. Marion County load is served by IPL and Tippecanoe County load is served by DEI. Some of the important generation plants include: [DEI] Gibson, [DEI] Gallagher, [DEI] Wabash River, [DEI] Cayuga, [IPL] Stout, and [BREC] Coleman.

Duke Energy Indiana (DEI)

Overview of Projects:

DEI has a total of 19 projects targeting board's approval in MTEP16. One project is Baseline Reliability Project (BRP), 13 projects are 69 kV Level and five projects are equipment replacement projects.

Baseline Reliability Projects

P11343: Re-conductor [DEI] Lafayette SE—[DEI] General Foods 138 kV line

Transmission Owner: Duke Energy Indiana

Project Description

Re-conductor 0.64 miles of the [DEI] Lafayette SE—[DEI] General Foods 138 kV line with 954-ASCR rated conductor in order to operate the line at 120° Celsius. Expected in-service date for this project is December 31, 2017 and estimated cost of the project is $1,536,000.

Project Need

Figure P11343-1 shows network details in the vicinity of this project. The Lafayette, IN, area load, within the blue rectangle, is fed by [DEI] Lafayette 138 kV bus on and [DEI] Westwood 138 kV bus.

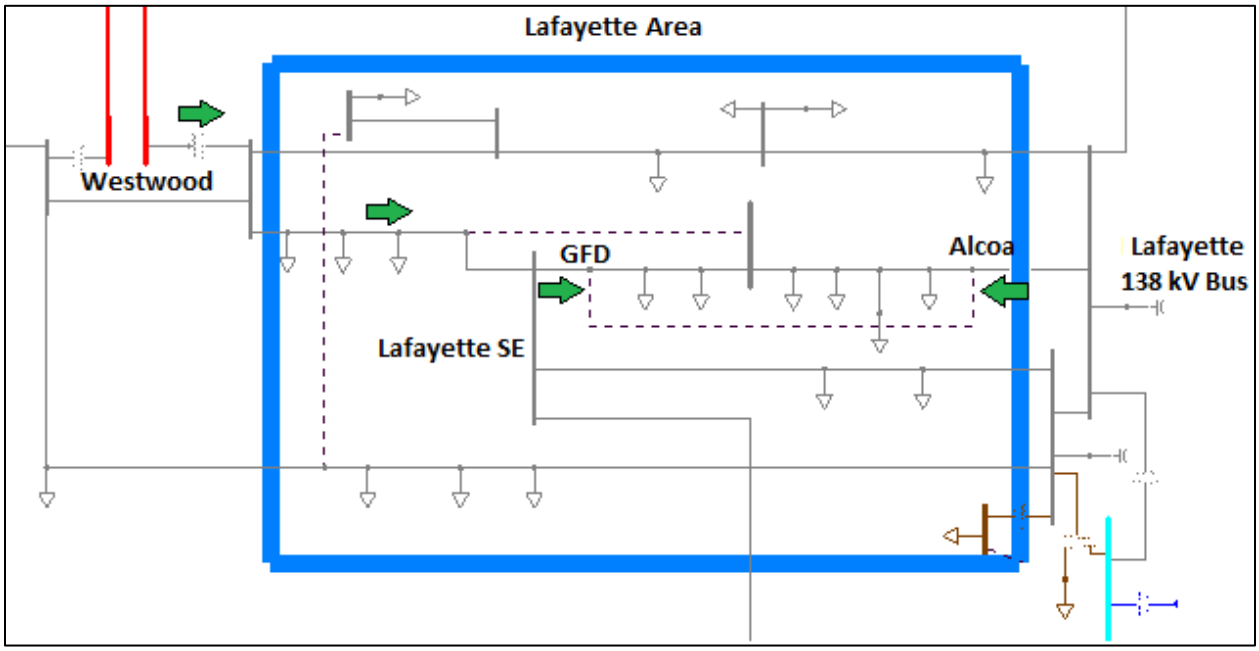


Figure P11343-1: Map showing flows in the Lafayette area

Inside this load pocket, a 138 kV connection between [DEI] Lafayette SE 138 kV substation and [DEI] Lafayette 138 kV substation feeds multiple loads. Power is supplied to these loads from either sides of the connection. Studies show that an outage of the 138 kV line from [DEI] Lafayette 138 kV substation to

[DEI] Alcoa 138 kV substation disconnects these loads from {DEI] Lafayette 138 kV substation. This causes excess power to flow from [DEI] Lafayette SE 138 kV side leading to the overloading of the [DEI] Lafayette SE—[DEI] General Foods 138 kV line. Figures P11343-2 and P11343-3 show this change in flow and the overloaded conductor.

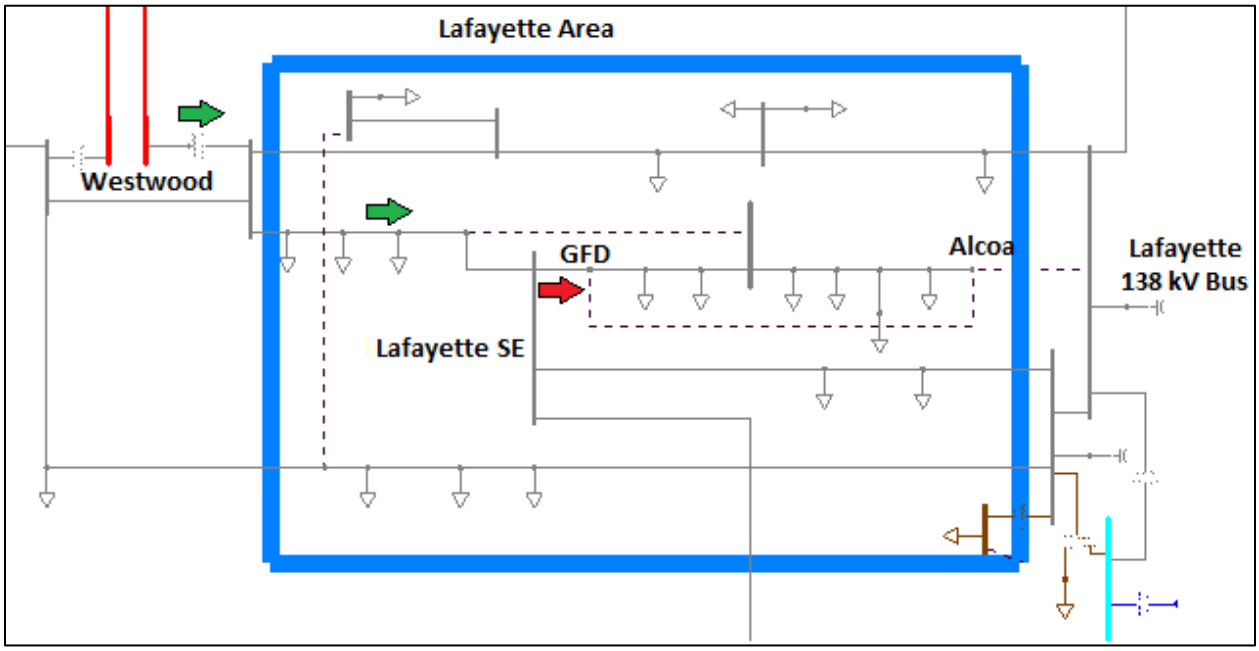


Figure P11343-2: Map showing change in flow due to outage

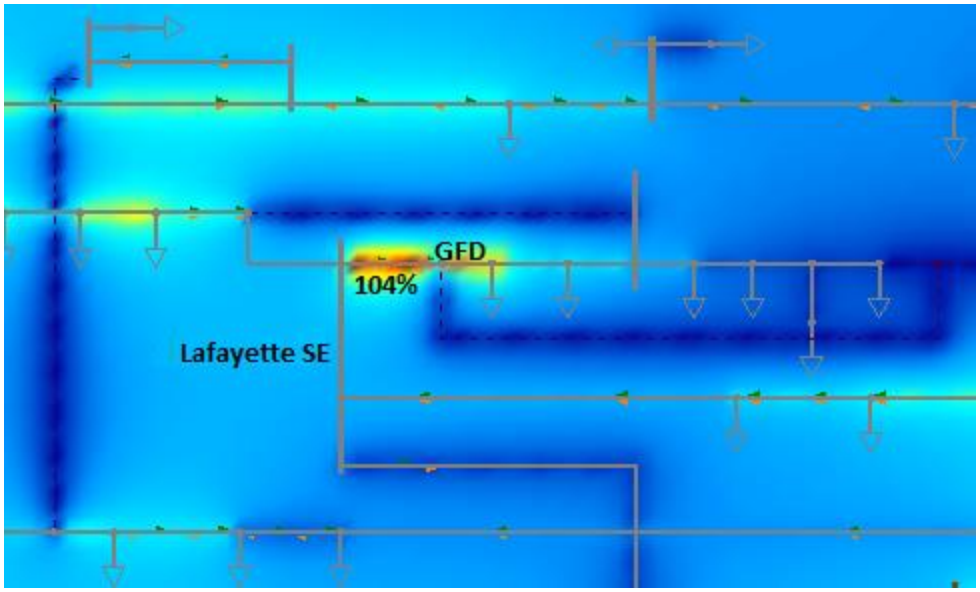


Figure P11343-3: Contour map showing overloaded conductor

Alternatives Considered

No other alternatives were considered.

Cost Allocation

This is a Baseline Reliability Project, which is not eligible for regional cost sharing.

P10144: Replace Cayuga 230 kV Substation 230 kV Breakers

Transmission Owner: Duke Energy Indiana

Project Description

This project will replace three 230 kV breakers and associated disconnect switches at the [DEI] Cayuga 230 kV substation. New breakers will have 3000 amp rating. The expected in-service date for this project is December 31, 2017 and the estimated cost of this project is $1.5 million.

Project Need

It was found in the studies performed by DEI that breaker short circuit interrupting capability for the equipment at the [DEI] Cayuga 230 kV substation is not sufficient.

Alternatives Considered

No other alternatives were considered.

Cost Allocation

This is a Baseline Reliability Project, which is not eligible for regional cost sharing.

Projects Driven by Age and Condition

Age and Condition Driven:

The projects shown in Table P-3 are all projects in Duke Indiana's control area that are deteriorating in performance due to age and condition.

Proj. ID	Project Name	Description	Expected ISD	Estimated Cost ($M)
P9890	New [DEI] Gibson—[DEI] Merom 345 kV dead end Structures	[DEI] Gibson—[DEI] Merom 345 kV line: Install ten (10) double dead end structures in this 34511 circuit.	12/31/2017	$4.4
P9854	Replace [DEI] Speed 138 kV Breakers	[DEI] Speed 138 kV, Replace OCB: 13850, 13857, 13869, 13881, 138138 TIE and obsolete relays on CIR 13850, 13857, 13881.	12/31/2017	$2.3

P9858	Replace [DEI] Bedford 345 kV Breakers and 345/138 kV Transformer	Bedford 345 kV: Replace 345/138 kV No. 7; Replace relays on CIR 6995, 13829, 13837, 34506, 34521. Replace all 69 kV and 138 kV Oil Circuit Breakers.	12/31/2018	$12
P9834	Rebuild [DEI] Noblesville--[DEI] Tipton W. 230 kV line	[DEI] Noblesville-[DEI] Tipton W 230 kV line: Replace all single/H-frame pole structures with steel poles, re-conductor with 954ACSR45X7 OVAL / OPGW and build Switching Station with 3-2000A line switches near existing Carmel 146th St. junction.	12/31/2018	$12

Table P-3: Age and condition projects in Duke Indiana

Projects Driven Other Needs

Other Projects

The projects shown in Table P-4 are projects that are all below the MISO BES (at 69 kV) and, therefore, not under MISO's functional control. These projects have been submitted by DEI for transparency reasons.

Proj. ID	Project Name	Description	Expected ISD	Estimated Cost
P9891	Flat Rock to Hope Jct. 69kV Pole Replacements	Flat Rock to Hope Jct. 6975 circuit pole replacements (45), replace line switches at both ends. Transfer existing conductor to new poles.	12/31/2016	$1,087,274
P9892	Lewis Creek to Flat Rock 69kV Pole Replacements	Lewis Creek to Flat Rock 6975 circuit pole replacements (100), replace line switches at Lewis Creek with 1200A. Transfer existing conductor to new poles.	6/1/2017	$1,875,342

P9905	Sharpsville to Windfall Jct. 69kV rebuild	Rebuild 69174 from Sharpsville sub to Windfall Jct. 477acsr at 120C w/ OPGW; replace 81 wood poles with light duty steel. Replace 3 Windfall Jct. switches with 1200A. Install new motor switches on 69-1 and 69-3 at Windfall Jct.	12/31/2017	$2,179,983
P9855	Columbus North Breaker/ Relay Replacements	Columbus North: Replace OCB 6975, 6929, 69230-1, 6950 and obsolete relays on CIR 6929, 6950, 6975, 6982. Also replace relays on CIR 23019.	12/31/2020	$2,711,016
P9893	Shelbyville Northeast CB and Relay Replacements	Shelbyville Northeast - Replace CIR 6946, 6976, 69183, 13803, 13865 relays, replace OCBs 6946, 6976, 69183, 69138-1, 13803, replace Bank 1 ground switch with circuit switcher, and station battery.	6/1/2017	$3,511,433
P9856	Walton 230/69 kV Breaker Replacements	Walton: Replace OCB 69 KV CAP BK, 69230-1, 69110, 69 KV TRANSFER, 6927, 6987, 23020-21.	12/31/2017	$3,303,866
P9889	Sharpsville to Kokomo SE 69kV rebuild	Rebuild 69174 Circuit from Sharpsville sub to Kokomo SE. 477acsr@120C w/ OPGW – replace 174 wood poles with light duty steel.	12/31/2017	$4,287,945
P9888	Middle Fork to Deer Circuit. Jct. 69kV rebuild	Rebuild 6988 Circuit from Middle Fork sub to dead end 879/1041-01 and from Deer Cr Junction to 879/1046. 477acsr@120C w/ OPGW - replace 187 wood poles with light duty steel.	12/31/2017	$4,860,632
P9897	River Ridge Gateway 138-12kV New Sub.	River Ridge Gateway 138-12kV Substation to be inserted in the 13857 circuit. between Clark Maritime and HE Northport	6/1/2018	$1,000,000
P9926	Spelterville 138-34kV Sub Expansion	Spelterville: expand sub footprint, Install 138/34kV 60MVA Bank	6/1/2017	$1,000,000
P9850	Lebanon Prairie Creek 69kV Switching Station	New Lebanon Prairie Creek 69kV Switching Station to be inserted in the 6983 Circuit.	12/31/2016	$3,518,244

P9914	Mohawk to Lee Hanna 69kV rebuild	Rebuild 5.84 mile 69kV-69130 Circuit from Mohawk to Mohawk Ind. Jct. to Lee Hanna Jct. with 954ACSR@120C. Replace 2 Lee Hanna Jct. line switches with 1200A	6/1/2017	$3,741,298
P2873	Danville E. 69kV looped feed	Construct new Danville East substation near HRH hospital - single 22.4MVA transformer - 6945 Circuit to be looped through	6/1/2018	$990,000

Table P-4: Other project types in Duke Indiana

Vectren (SIGE)

Overview of Projects

Vectren has a total of six projects targeting Board approval in MTEP16. One project is relocation of 138 kV Line; five projects are 69 kV-level. Vectren does not have any Baseline Reliability projects.

Projects Driven by Other Needs

Other Projects

The projects shown in Table P-5 are projects that are driven by other needs. The first project shown (P9942) is to relocate the Grimm Road – Warrick North 138 kV substations. The remaining projects in the table are all below the MISO BES (at 69 kV) and therefore, not under MISO's functional control. These projects have been submitted by Vectren for transparency reasons.

Proj. ID	Project Name	Description	Expected ISD	Estimated Cost
P9942	Z85 138 kV Line Relocation for Road Widening	Public Roadway relocation of 1.25 miles of Z85 138kV line	12/31/2016	$1,200,000
P9948	Rebuild the [SIGE] Pelzer--[SIGE] Chrisney 69 kV line No. Y56	Rebuild the [SIGE] Pelzer--[SIGE] Chrisney 69 kV line No. Y56	12/31/2019	$6,800,000
P9946	New Adams Substation for Distribution	69kV/12kV distribution substation to serve customer load (Y65).	12/31/2018	$5,300,000
P4393	Rebuild the [SIGE] Dubois--[SIGE] Huntingburg 69 kV line No. Y67	Rebuild 3.5 miles of the [SIGE] Dubois--[SIGE] Huntingburg 69 kV line No. Y67	12/31/2018	$2,625,000
P9940	New [SIGE] Elliott 69 kV Distribution substation and Y52 69kV Line Loop	New Distribution Substation with 9.375MVA 69kV/12kV transformer and Y52 69kV loop from Elliott sub to Sunbeam sub for load growth	12/31/2015	$1,350,000
P9952	Y43 Berry Plastics Sub Loop Feed	Berry Plastics Substation loop feed (69kV Y43).	12/31/2018	$450,000

Table P-5: Other project types in Vectren

Indianapolis Power and Light Co. (IPL)

Overview of Projects:

IPL has a total of Nine (9) projects targeting Board approval in MTEP16. Six (1) projects are Baseline Reliability Project (BRP), one (1) project is driven by generation deliverability and one (1) projects is equipment replacement project.

Baseline Reliability Project

P11123: Guion Relay Addition

Transmission Owner: Indianapolis Power and Light

Project Description

This project adds a redundant relay at Guion 138 kV Substation. Expected in-service date for this project is July 15, 2017 and the MISO-estimated cost of the project is approximately $50,000.

Project Need

Figure P11123-1 shows network details in the vicinity of project. Load levels at [IPL] West Lane, [IPL] Georgetown and [IPL] Pike 138 kV substations are fed by two sources: namely [IPL] Guion 138 kV substation and the [IPL] Rockville 138 kV substation.

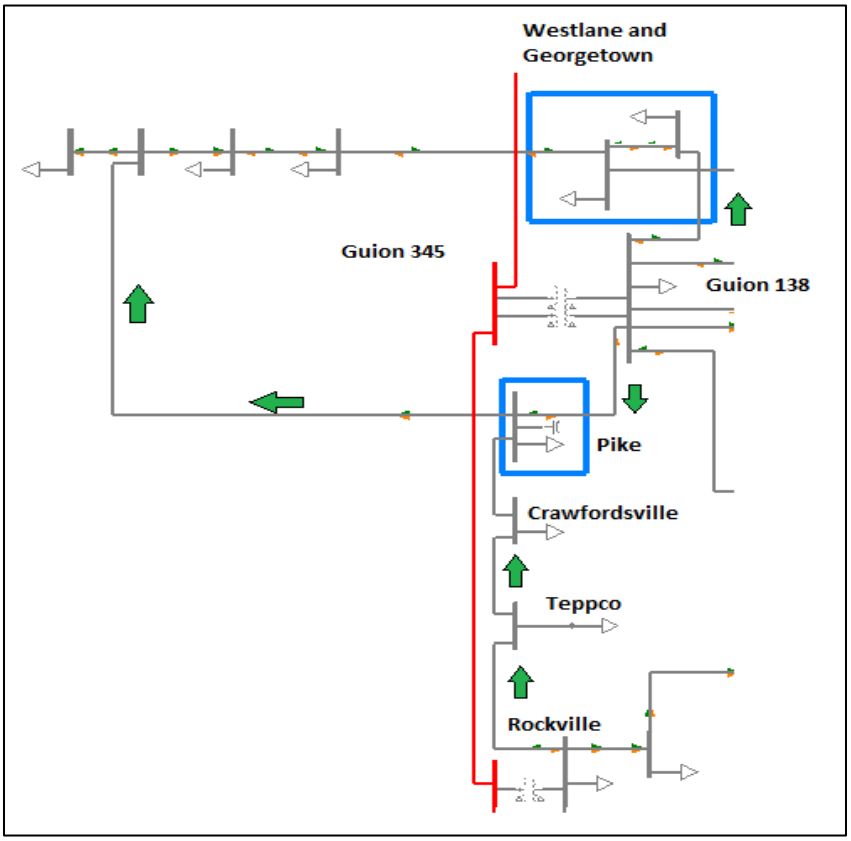


Figure P11123-1: Map showing flows in the vicinity of Guion substation

Studies show that relay failure at the [IPL] Guion 138 kV substation disconnects these loads from the [IPL] Guion 1,389 kV source. This causes access power to flow from the [IPL] Rockville 138 kV side leading to the overloading of the [IPL] Rockville—[IPL] Teppco—[IPL] Crawfordsville 138 kV line. *Figure* P11123-2 shows this change in flow and the overloaded conductor. Figure P11123-3 shows the contour mapping of the overloaded lines.

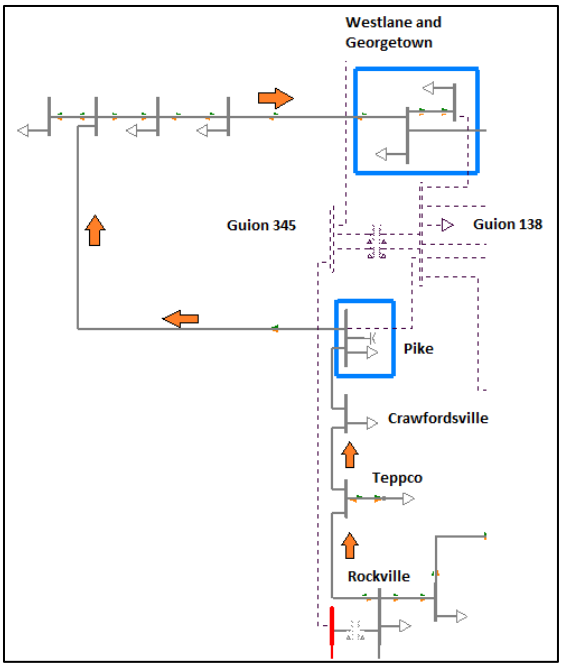


Figure P11123-2: Map showing change in flow due to outage

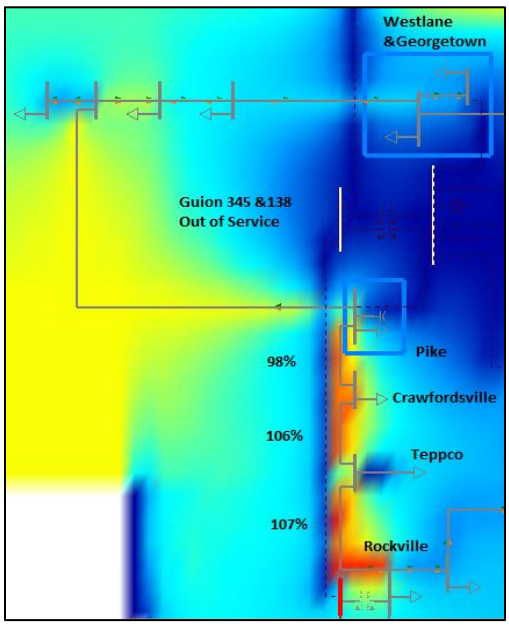


Figure P11123-3: Contour map showing overloaded conductor

Alternatives Considered

Re-conductoring of Rockville –Teppco – Crawfordsville 138 kV line. Adding redundant relay is a cheaper option and hence is the preferred one.

Cost Allocation

This is a Baseline Reliability Project, which is not eligible for regional cost sharing.

Projects Driven by Other Needs

Other Projects

The projects shown below in Table P-6 are projects that are driven by other needs. These projects have been submitted by IPL for transparency reasons. Also, the cost estimates shown below are developed by MISO.

Proj. ID	Project Name	Description	Expected ISD	Estimated Cost
P9220	Replace [IPL] Parker 138 kV substation breakers	Replacement of three 138 kV breakers at Parker Substation; Two line breakers for the 132-07 and 132-17 transmission lines and a bus-tie breaker.	12/31/2018	$900,000
P9221	Replace [IPL] Southport 138 kV substation breakers	Replacement of one 138 kV breaker at Southport Substation; One line breaker for the 132-29 transmission line.	12/31/2016	$300,000
P9222	Replace [IPL] Thompson 138 kV substation breakers	Replacement of three 138 kV breakers at Thompson 138 kV Substation; Two line breakers for the 132-68 and 132-77 transmission lines and a bus-tie breaker.	12/31/2016	$900,000
P9223	Replace [IPL] River Road 138 kV substation breakers	Replacement of one 138 kV breaker at River Road Substation; One bus-tie breaker.	12/31/2018	$300,000
P9602	Replace [IPL] Mooresville 138 kV substation breakers	Replacement of three 138 kV breakers at Mooresville Substation; Two line breakers for the 132-84 and 132-24 lines and a bus-tie breaker.	12/31/2016	$900,000
P11643	Replace [IPL] Stout 345/138 kV auto-Transformer	Replace Stout Auto Transformer due to equipment failure	6/1/2017	$1,500,000
P11523	Upgrade [IPL] Stout CT--[IPL] Stout North 138 kV line	Increase line rating from 322 to 345 MVA. This project is driven by generation deliverability.	6/30/2021	$1,000,000

Table P-6: Other project types in IPL

Hoosier Energy (HE)

No projects in MTEP16 database.

Big Rivers Electric Corporation (BREC)

No projects in MTEP16 database.