



MISO Identified Regional Issues & Planned Solution near the MISO-PJM Seam

Supplemental material for *MISO-PJM Annual
Issues Review IPSAC Meeting*

February, 17, 2023

Notes



- This presentation provides an overview of significant MISO MTEP transmission projects near the MISO-PJM seam which have either been approved in MTEP22 Appendix A or proposed MTEP23
- It is not a comprehensive review of all planned projects in MISO. For a complete list of projects see the following Public Documents
 - MTEP22 Report (notably, Appendix A)
 - [MTEP22 Report \(misoenergy.org\)](https://www.misoenergy.org/MTEP22-Report)
 - MTEP Projects Under Evaluation Status Report
 - [Project Lists and Status Reports \(misoenergy.org\)](https://www.misoenergy.org/Project-Lists-and-Status-Reports)
 - Planning Advisory Committee (PAC) Materials
 - [MISO Planning Advisory Committee \(misoenergy.org\)](https://www.misoenergy.org/MISO-Planning-Advisory-Committee)
 - Subregional Planning (SPM) Materials
 - [Subregional Planning Meeting \(misoenergy.org\)](https://www.misoenergy.org/Subregional-Planning-Meeting)

MTEP 22 Approved Project Highlights

MISO East and Central Subregion

AmerenMO

Reconfigure Dillon 138 kV Capacitor Bank (28 Mvar) to address voltage fluctuation for a P1-2 event

• P21967 Baseline Reliability Project

• Project description

- This project will split the existing 28 Mvar capacitor into two 14 Mvar banks reducing the voltage fluctuations caused during a P1-2 contingency event.

• System Need

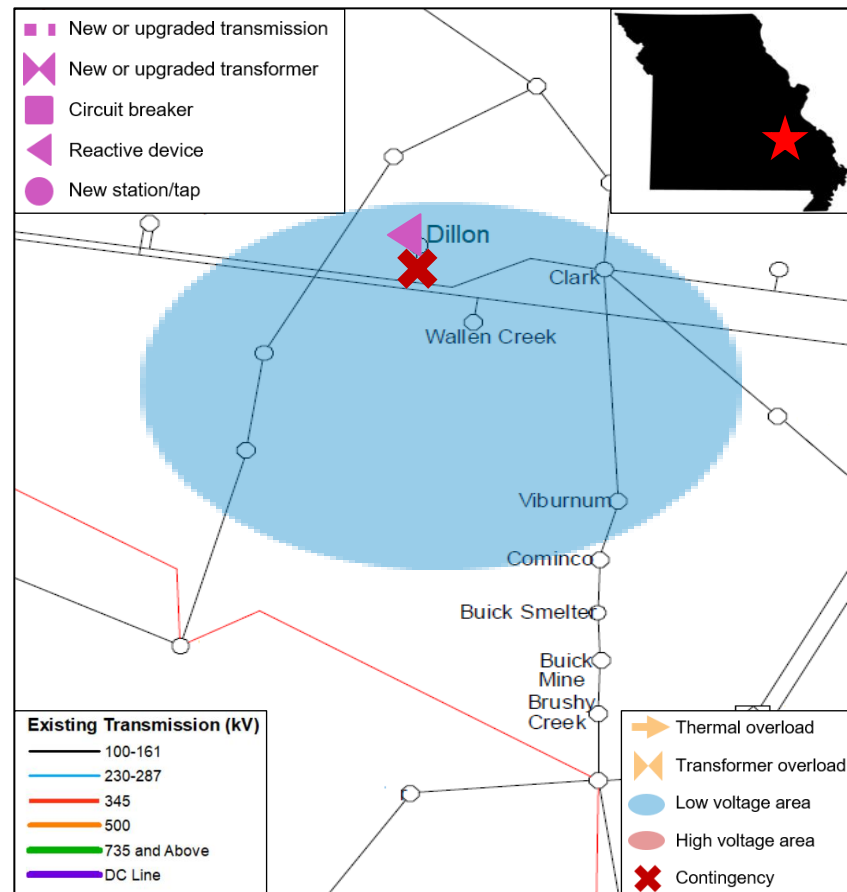
- Address Ameren's voltage fluctuation limits exceedance in accordance with their local planning criteria. This project will reduce the voltage fluctuations caused by the existing 28 Mvar cap bank.

• Estimated Cost: \$500 k

• Expected ISD: June 1, 2023

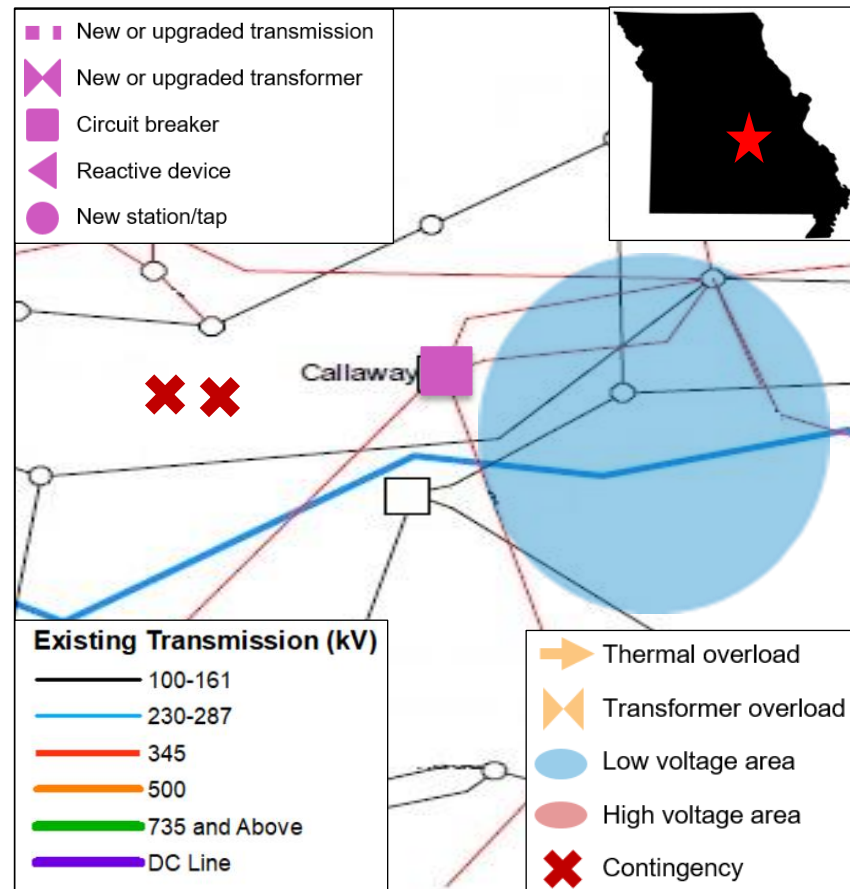
• Target Appendix: A in MTEP22

• NTA Consideration: no



Upgrade Callaway 345 kV Substation solves P4 voltage stability issue

- **P21971 - Baseline Reliability Project**
- **Project description**
 - Add breakers on the high side of safeguard transformer A and B at Callaway 345 kV substation.
- **System Need**
 - *P4 Event*: Voltage stability.
- **Estimated Cost: \$3.0M**
- **Expected ISD: June 1, 2023**
- **Target Appendix: A in MTEP22**
- **NTA Consideration: no**



Duke Energy (DEI)

Replacing the [DEI] Dresser 138 kV Breaker solves a short circuit issue

- **P22206 - Baseline Reliability Project**

- **Project description**

- Five Dresser 138 kV breakers were over duty in MTEP21 analysis.
- Replace these over duty Dresser breakers with higher interruption capacity.

- **System Need**

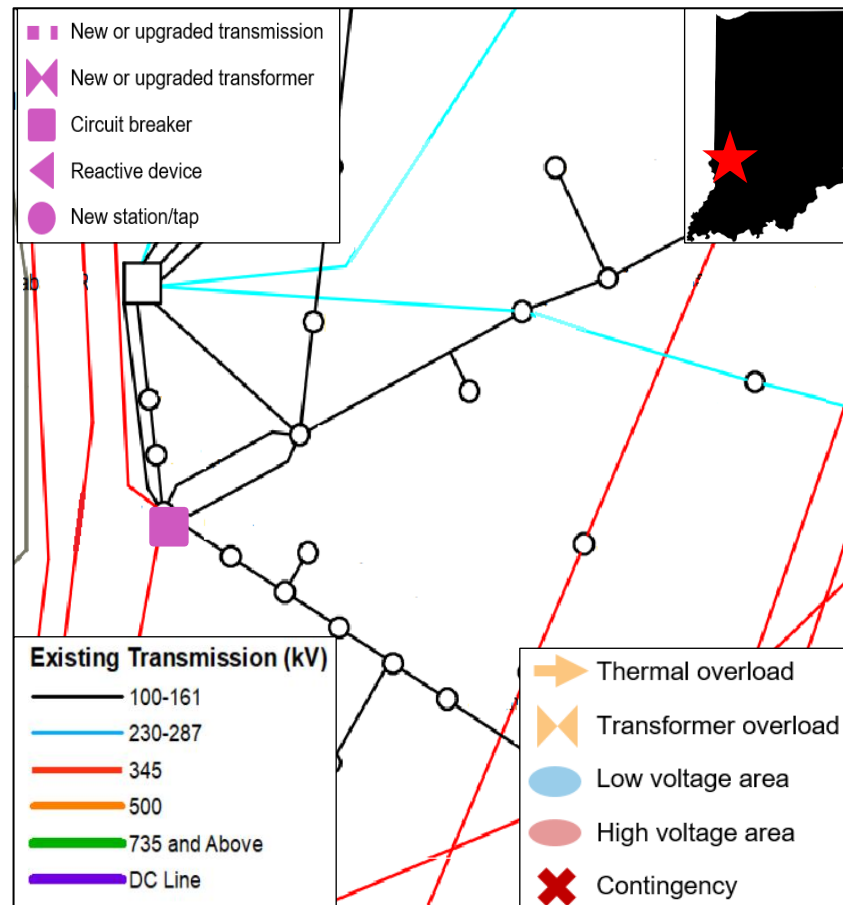
- Breaker overload violations are caused by certain fault conditions at Dresser substation in MTEP21 analysis.

- **Estimated Cost: \$0.56 M**

- **Expected ISD: March 20, 2026**

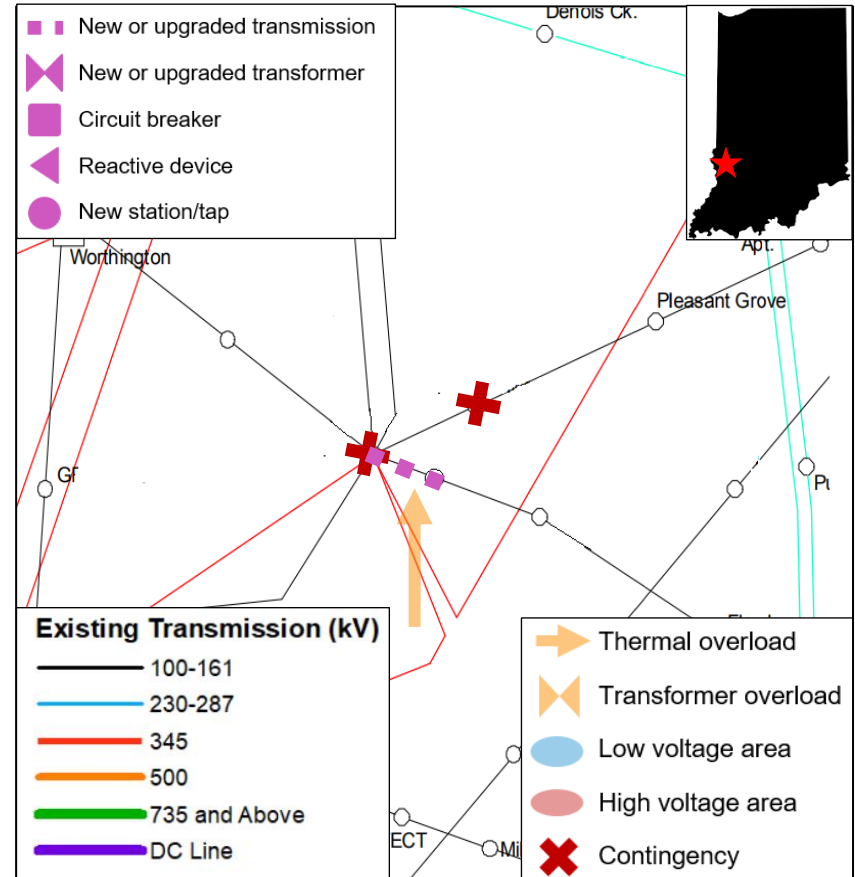
- **Target Appendix: A in MTEP22**

According to CFR agreement the TOs are responsible to perform Short circuit analyses. Therefore, MISO depends on TO's short circuit study reports to justify projects arising from short circuit studies.



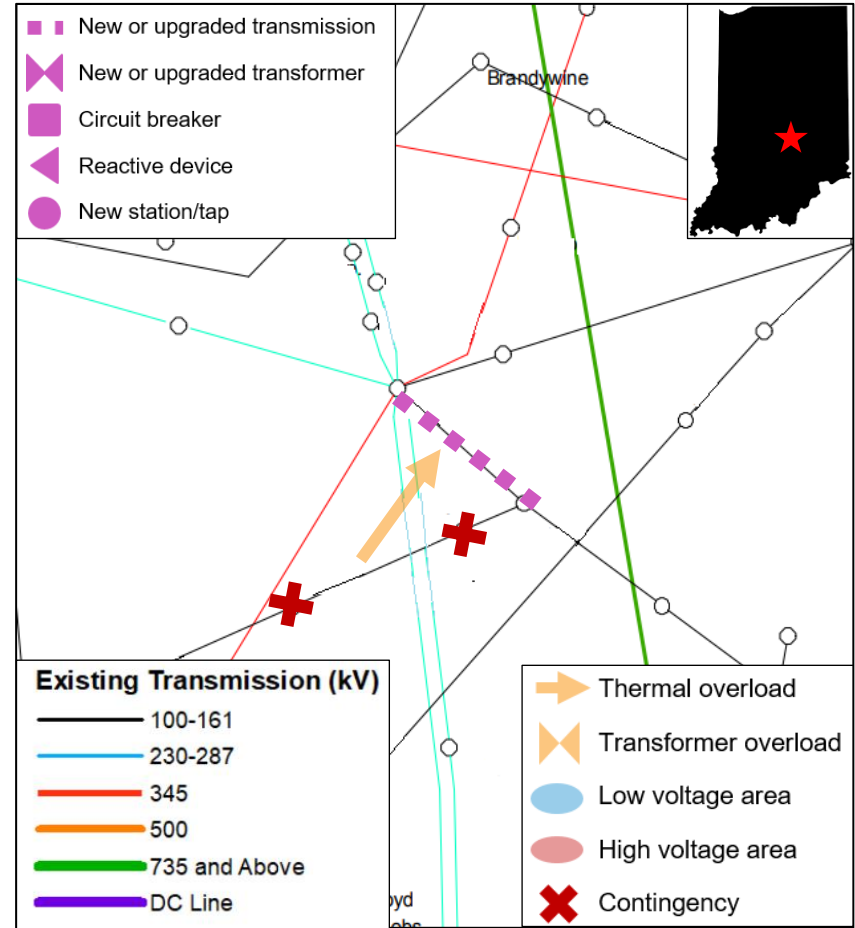
Rebuild [DEI] Bedford—[DEI] Mitchell Lehigh 138 kV line solves P6-1-1 thermal overload

- **P22208 - Baseline Reliability Project**
- **Project description**
 - Rebuild 13822 line section of Bedford to Mitchell Lehigh 138 kV line with 954ACSR@120C.
 - Upgrading this line will increase the summer emergency rating from 133 MVA to 301 MVA
- **System Need**
 - P6-1-1 Event: 113% overloaded in year 2023 summer peak
- **Estimated Cost: \$17.9M**
- **Expected ISD: June 1, 2027**
- **Target Appendix: A in MTEP22**



Upgrade [DEI] Columbus-[DEI] Seymour 138 kV line solves P6-1-1 thermal overload

- **P22209 - Baseline Reliability Project**
- **Project description**
 - Upgrade Columbus-Seymour 138 kV line with summer emergency rating of 178 MVA.
- **System Need**
 - P6-1-1 event, BES line overload to 108% in a year 2023 Summer peak.
- **Estimated Cost: \$0.5M**
- **Expected ISD: June 1, 2027**
- **Target Appendix: A in MTEP22**



New [DEI] Wabash River 345/230 kV Substation solves multiple TPL thermal overloads

- **P22226 - Baseline Reliability Project**

- **Project description**

- Add Sanford 345 kV 3-CB ring bus in the 34513 Cayuga - Sugar Crk line
- Build 5.5 mile 345 kV - 34556 line to Wabash River Station and add 345/230 kV transformer(s) at Wabash River Station.

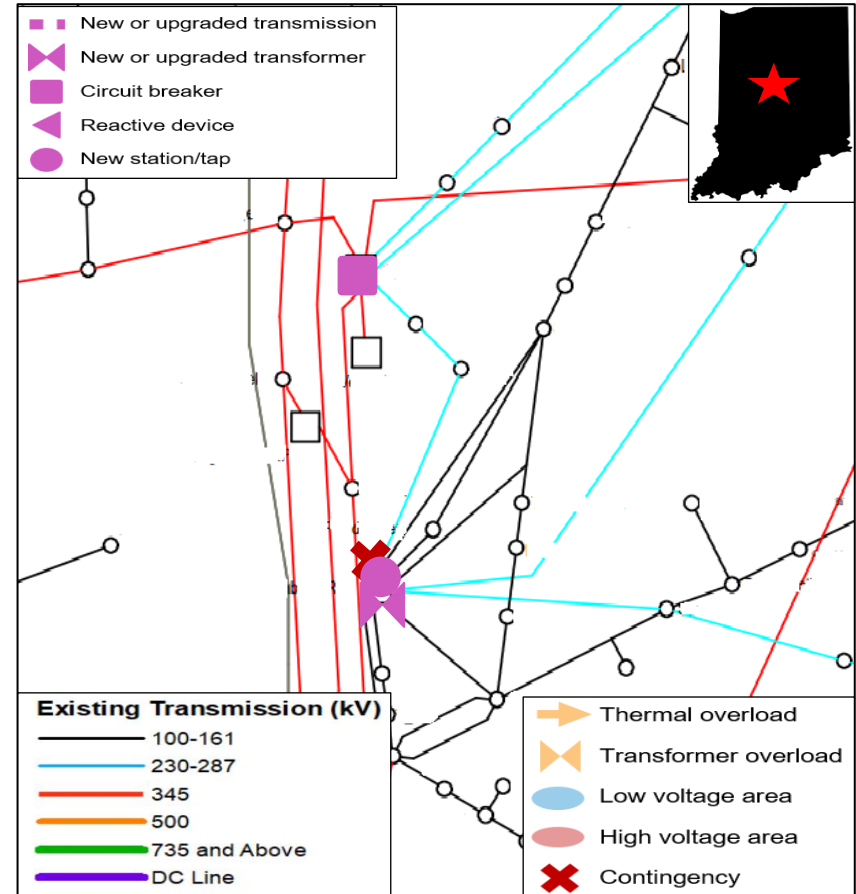
- **System Need**

- Past MTEP results have shown multiple lines and transformers overloads for multiple TPL categories.
- Using short term ratings and operating mitigations are no longer deemed acceptable for the long term to address the overload.

- **Estimated Cost: \$50M**

- **Expected ISD: October 22, 2026**

- **Target Appendix: A in MTEP22**



New [DEI] Staunton 230/138 kV transformer solves P6-1-1 thermal overload

- **P22227 - Baseline Reliability Project**

- **Project description**

- Add a third parallel 230/138 kV transformer at Staunton sub

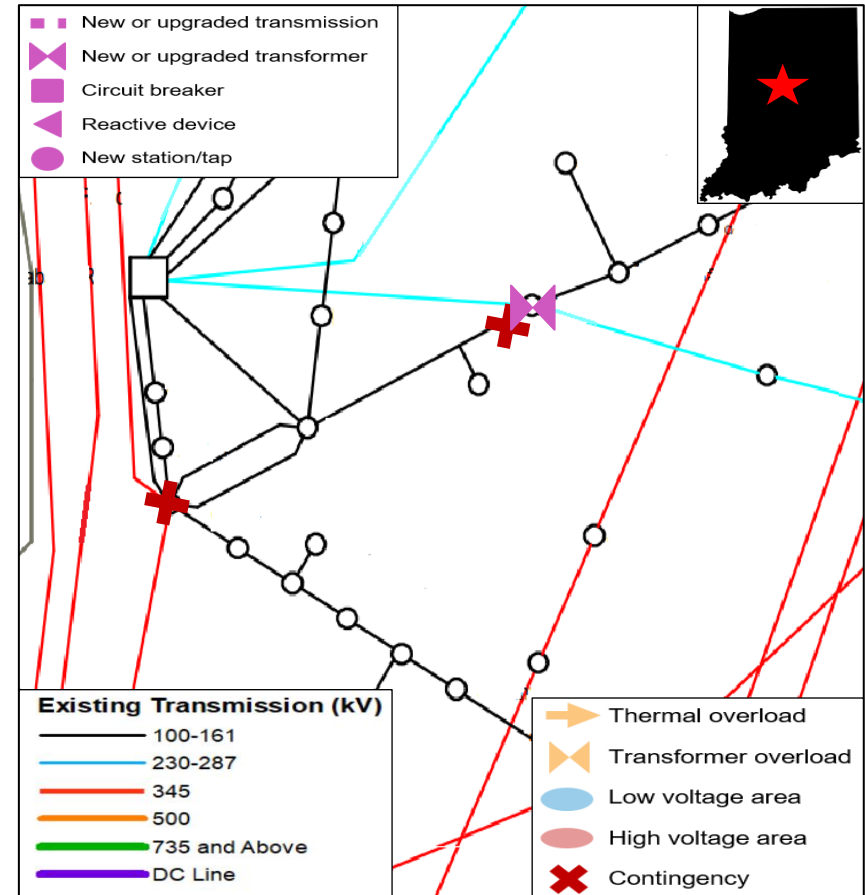
- **System Need**

- P6-1-1 events, 103% overloaded in the 2023 Summer peak

- **Estimated Cost: \$6.0M**

- **Expected ISD: December 31, 2026**

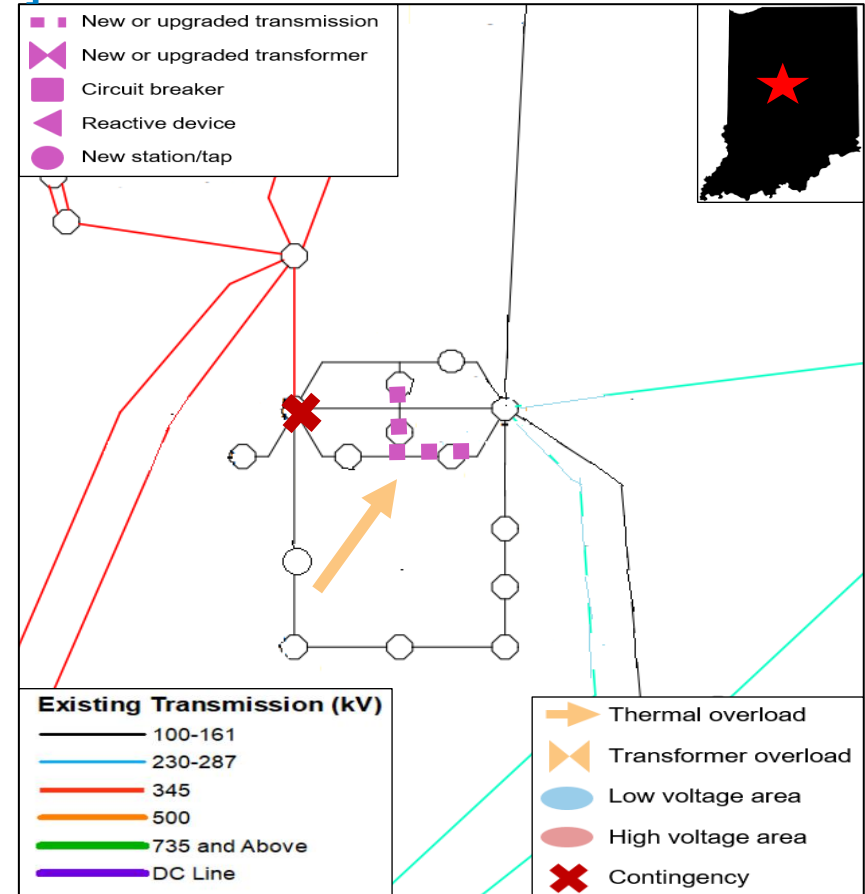
- **Target Appendix: A in MTEP22**



Rebuild [DEI] Purdue NW Tap-[DEI] Cincinnati St. 138 kV line solves P6-1-1 thermal overload

- **P22265 - Baseline Reliability Project**
- **Project description**
 - Rebuild the 13820 line from Purdue NW Tap to Cincinnati St. using 954 ACSR at 120 C
- **System Need**
 - P6-1-1 events, 133% overloaded in the 2023 Summer peak.
- **Estimated Cost: \$45.0M**
- **Expected ISD: December 31, 2025**
- **Target Appendix: A in MTEP22**

*This project is a replacement of P20230 in MTEP21
*additional line section added to P20230 scope
*increased costs per the latest Eng'g estimates

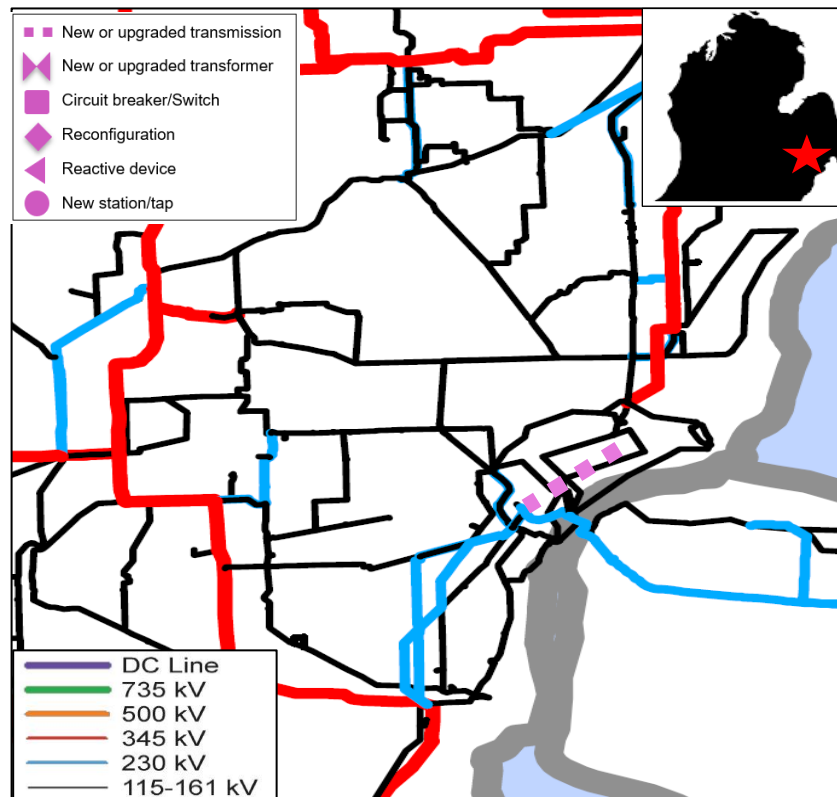


ITCT

ITCT 17999*- Re-conductor Corktown - Waterman 120 kV UG

– Project Justification

- **Baseline Reliability Project****
- **Project description**
 - Re-conductor approximately 3.7 miles of the Corktown – Waterman 120 kV underground cable utilizing 5000 Kcmil underground cable.
- **System Needs**
 - The Corktown – Waterman 120 kV underground cable is projected to marginally overload.
- **Estimated Cost: \$7.0M**
- **Expected ISD: 06/01/2024**
- **Target Appendix: A in MTEP22**



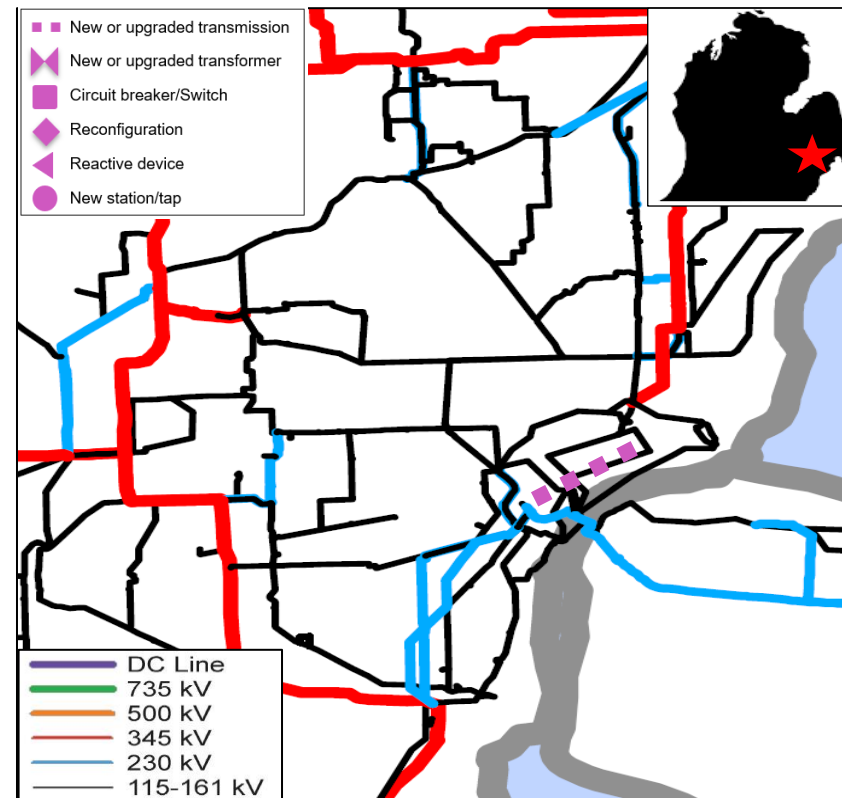
*Project was previously proposed in MTEP20.

**Issue identified in MISO's MTEP21 independent analysis and ITC's internal assessment

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ITCT 21745 - Cato - Waterman 120 kV Re-conductor – Project Justification

- **Baseline Reliability Project***
- **Project description**
 - The Cato – Waterman 120 kV underground cable is projected to overload for P11 and P6 contingencies during peak load. The limiting elements on this circuit are the cable conductor.
- **System Needs**
 - The proposed solution is to re-conductor approximately 4.43 miles utilizing 1600MM2 CU XLPE underground cable.
- **Estimated Cost: \$15M**
- **Expected ISD: 06/01/2026**
- **Target Appendix: A in MTEP22**

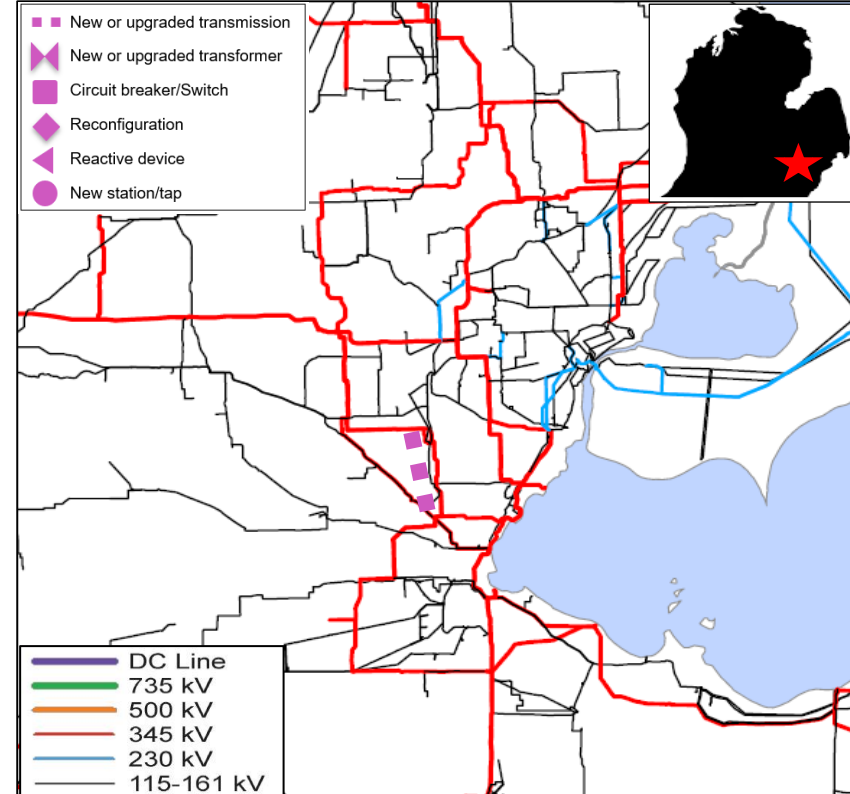


*Issue identified in MISO's MTEP21 independent analysis and ITC's internal assessment

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ITCT 15875* - Kentucky - Luzon 120 kV Sag Remediation – Project Justification

- **Baseline Reliability Project****
- **Project description**
 - Completely remove the sag limit on the Kentucky – Luzon 120 kV line.
- **System Needs**
 - The Kentucky – Luzon 120 kV line is projected to be overloaded for several shutdown-plus-contingency that involve the loss of the Brownstown – Swan Creek 120 kV line. The identified overloaded equipment on this circuit is the sag limit. The thermal violations are found in peak and off-peak conditions.
- **Estimated Cost: \$0.5M**
- **Expected ISD: 06/01/2024**
- **Target Appendix: A in MTEP22**



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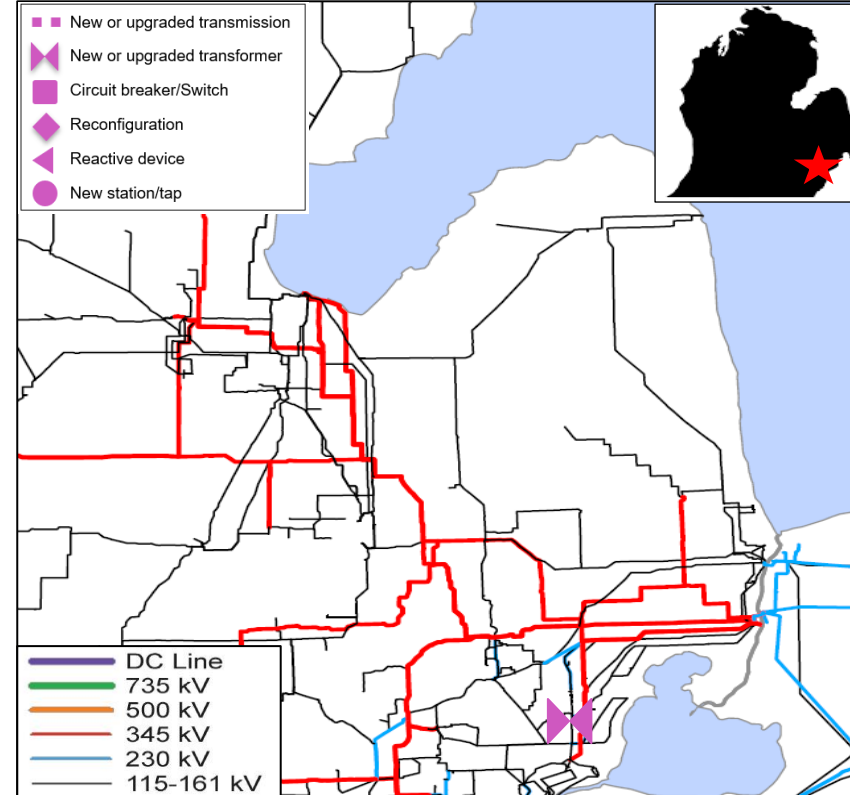
*Project was previously proposed in MTEP20.

**Issue identified in MISO's MTEP21 independent analysis and ITC's internal assessment

ITCT- 21726 Warren 120kV Pos JJ Station Equipment Upgrade – Project Justification

- **Baseline Reliability Project***
- **Project description**
 - Replace station equipment at Warren to meet or exceed 528 MVA (2540 Amps)
- **System Needs**
 - The station equipment at Warren Pos JJ is projected to be overloaded for P21 contingency during peak load condition.
- **Estimated Cost: \$0.16M**
- **Expected ISD: 6/1/2026**
- **Target Appendix: A in MTEP22**

*Issue identified in MISO's MTEP21 independent analysis and ITC's internal assessment



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METC

METC 21485 – Lawndale - Murphy 138kV Sag Remediation- Project Justification

- **Baseline Reliability Project**

- **Project description**

- The proposed solution is to remove sag limits on the Lawndale to Murphy 138 kV line to conductor limit.

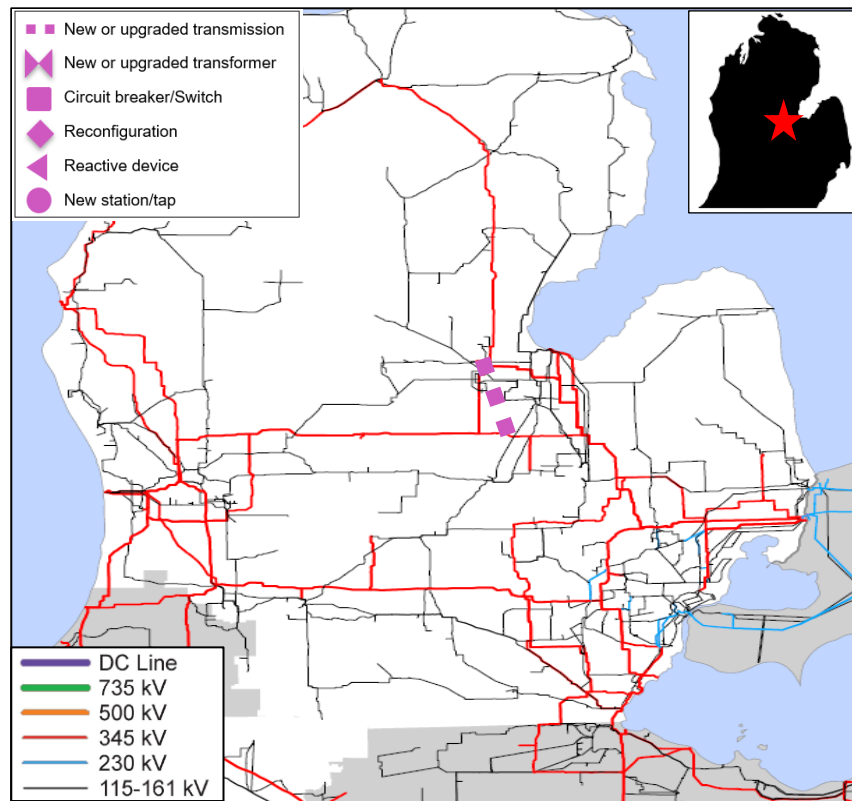
- **System Need**

- Lawndale to Murphy 138 kV line is projected to be overloaded for P1, P2, P3, P6, and P7 contingencies in peak and off-peak scenarios. This consequently causes the Lawndale to Murphy 138kV line section to exceed its summer emergency limit. The overloaded equipment identified on this circuit is the overhead conductor, 795 ACSR 26/7.

- **Estimated Cost: \$1M**

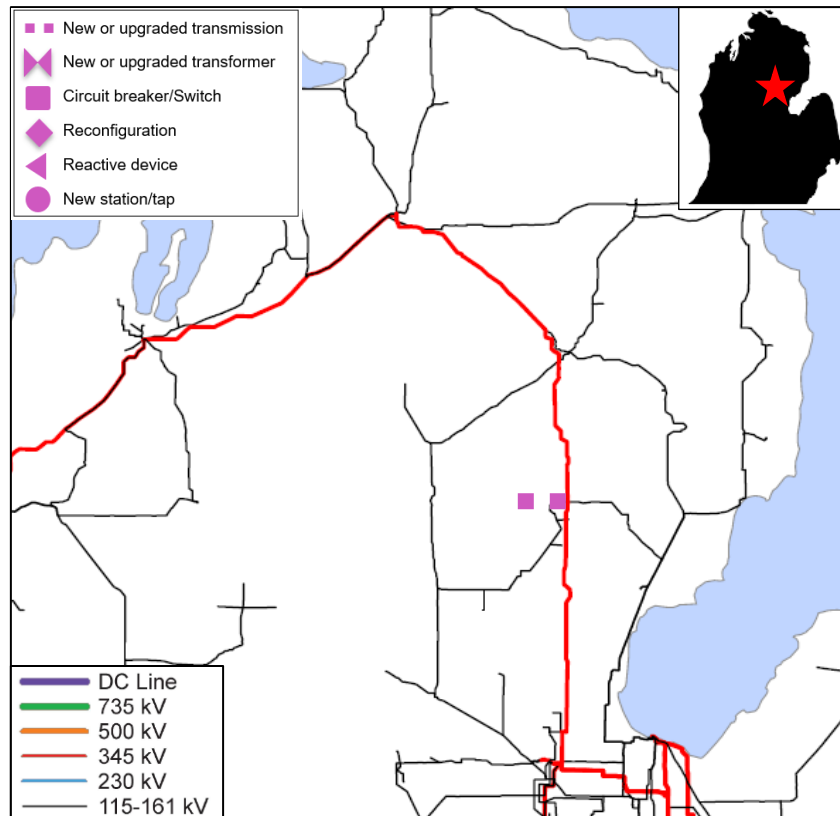
- **Expected ISD: 12/31/2025**

- **Target Appendix: A in MTEP22**



METC 21890 – Gallagher - Ogemaw 138 kV Sag Remediation- Project Justification

- **Baseline Reliability Project**
- **Project description**
 - Remediate sag on the 336 ACSR conductor on the Gallagher to Ogemaw 138 kV circuit up to at least 60 MVA summer emergency rating.
- **System Need**
 - The Gallagher - Ogemaw 138 kV circuit is projected to be overloaded for P2, P5, and P6 contingencies during peak load conditions. The identified overloaded equipment on this circuit is the sag limit on the Gallagher – Ogemaw 138 kV sections.
- **Estimated Cost: \$0.66M**
- **Expected ISD: 12/31/2025**
- **Target Appendix: A in MTEP22**



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Prairie Power Inc. (PPI)

New Forest City 138/69 kV Substation to solves P6-1-1 event

- **P21794 Baseline Reliability Project**

- **Project description**

- New Forest City 138/69 kV substation in Menard Electric Cooperative. This substation will connect to the Ameren Havana to Cincinnati 138 kV line on the high side and to the Menard Electric Cooperative Forest City to Bishop 69 kV line on the low side with an 84 MVA transformer.

- **System Need**

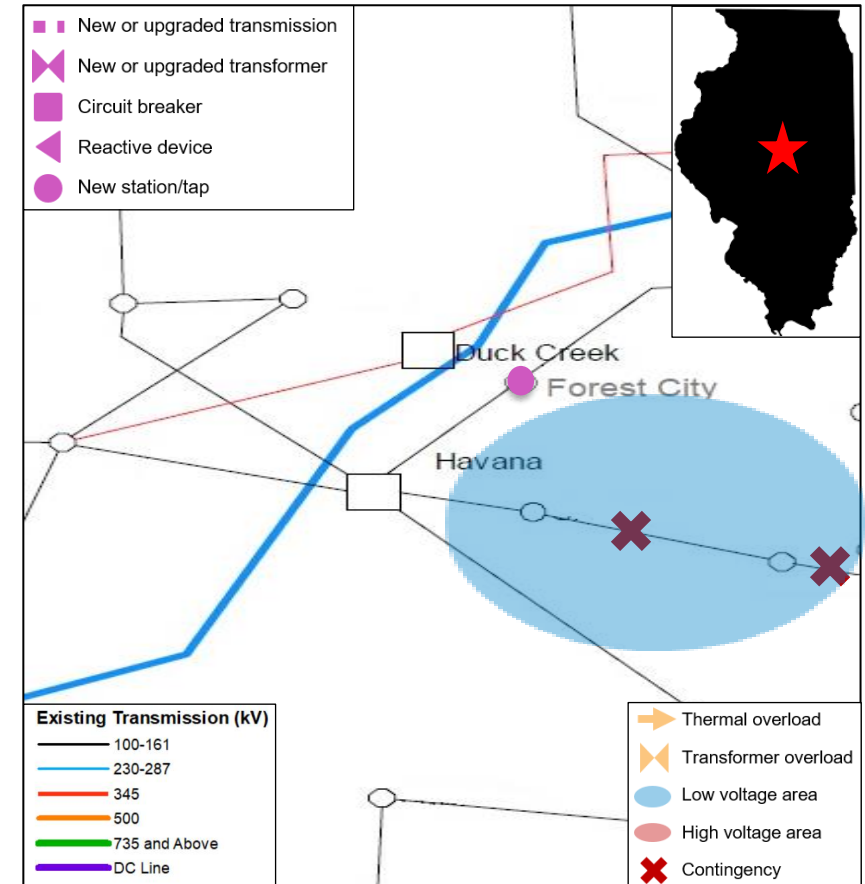
- *P6-1-1 Event:* Backup Grand Island transformer for Menard Electric Cooperative, provide alternative feed to Ameren's Mason City 138 kV substation for P6 event.

- **Estimated Cost:** \$7.7 M

- **Expected ISD:** December 31, 2025

- **Target Appendix:** A in MTEP22

- **NTA Consideration:** no



MTEP 23 Projects and Issues Under Review

MISO East and Central Subregion

Preliminary projects and issues are detailed in 1st Subregional planning meeting (SPM) materials

- East Subregional SPM 1: February 8, 2023
 - [East Subregional Planning Meeting \(ESPM\) - February 8, 2023 \(misoenergy.org\)](https://www.misoenergy.org/central-subregional-planning-meeting-cspm)
- Central Subregional SPM 1: February 2, 2023
 - [Central Subregional Planning Meeting \(CSPM\) - February 2, 2023 \(misoenergy.org\)](https://www.misoenergy.org/central-subregional-planning-meeting-cspm)
- MTEP23 powerflow models expected March 2023. Please see MISO modeling page for updates.
 - [Planning Modeling \(misoenergy.org\)](https://www.misoenergy.org/planning-modeling)