

Impacts of MISO DPP-2016-August

Projects on PJM Facilities

1. MISO generators studied:

Project	Service Type	DPP Region	Fuel Type	Net MW Size (Summer)	Net MW Size (Winter)	POI
J619	NRIS	SOUTH	Solar	50	50	Champagne 69kV Substation
J620	NRIS	SOUTH	Solar	100	100	Tap 1396 - Tap 1398 115kV
J622	NRIS	SOUTH	Solar	100	100	Remington 115kV Substation
J634	NRIS	SOUTH	Solar	100	100	Mossville-Toomey 138kV Line
J456	NRIS	CENTRAL	Wind	150	150	138 kV Niota-Macomb Northeast Line just south of Sciota, IL
J484	NRIS	SOUTH	Gas	933.8	1056.2	Existing Entergy Nelson Power Station
J516	NRIS	SOUTH	Solar	150	150	Vacherie Substation 230kV
J572	NRIS	MI	Combined Cycle	150	150	Filler City JCT 138kV
J575	NRIS	West	Wind	100	100	Brookings County Substation 345 kV
J577	NRIS	West	Wind	102.8	102.8	345kV Brookings County Sub
J586	NRIS	SOUTH	Solar	175	175	EAI Crooked Lake 161kV Substation
J587	NRIS	West	Wind	200	200	J460 substation on the Brookings-H081 345kV line
J588	NRIS	SOUTH	Solar	100	100	Creenshaw 115kV
J643	NRIS	CENTRAL	Solar	175	175	Line tap RM Schahfer-Starke 138kV Line
J446	NRIS	CENTRAL	Wind	200	200	Frankfort-New London 230 kV
J474	NRIS	CENTRAL	Wind	144	144	Existing 138 kV North Clinton Switch Station substation
J476	NRIS	CENTRAL	Wind	246	246	Existing 345 kV Atchison County Sub

Project	Service Type	DPP Region	Fuel Type	Net MW Size (Summer)	Net MW Size (Winter)	POI
J477	NRIS	SOUTH	Gas	31.9	36.4	Close to Entergy Hinds Power Station
J481	NRIS	SOUTH	Gas	241	296.5	Existing Michoud Power Station
J483	NRIS	SOUTH	Solar	99.96	99.96	Line tap at 138 kV line approximately 6,000 ft SW of Gordon Sub
J511	NRIS	West	Wind	200	200	GRE Stanton Substation 230 kV bus, Stanton ND
J512	NRIS	West	Wind	250	250	Nobles - Fenton 115kV line
J513	NRIS	CENTRAL	Wind	100.5	100.5	Reynolds 138kV
J541	NRIS	CENTRAL	Wind	400	400	Zachary (Adair in PSSe case) – Ottumwa 345 kV Line
J544	NRIS	SOUTH	Solar	98.1	98.1	Galion 115kV Substation
J555	NRIS	West	Wind	140	140	Montezuma, IA 50171 345kV substation
J559	NRIS	SOUTH	Solar	50	50	EEL Holton - Franklinton 115kV
J569	NRIS	West	Wind	100	100	Rock County 161kV substation
J593	NRIS	West	Wind	250	250	Tioga 4 230kV Substation (MDU)
J594	NRIS	West	Wind	300	300	Jackson North 161kV (ITCM)
J595	NRIS	CENTRAL	Wind	150	150	Frankfort to New London 230kV Line Tap
J597	NRIS	West	Wind	300	300	Brookings County Substation 345 (XEL)
J599	NRIS	West	Wind	200	200	Glenham 230kV Substation
J601	NRIS	MI	Wind	100	100	Kilgore 120kV Substation
J602	NRIS	MI	Wind	200	200	Goss 138kV Substation
J603	NRIS	SOUTH	Solar	99.96	99.96	Montrose 115kV
J604	NRIS	SOUTH	Solar	99.96	99.96	Ruleville 115kV Sub
J606	NRIS	ATC	Wind	150	150	La Crosse to North Madison 345kV Line Tap (ATC)
J607	NRIS	West	Wind	200	200	Wishek – Heskett 230 kV line

Project	Service Type	DPP Region	Fuel Type	Net MW Size (Summer)	Net MW Size (Winter)	POI
J608	NRIS	MI	Wind	100	100	Deja 138kV Substation
J609	NRIS	MI	Wind	136	136	White Road 115kV Substation
J611	NRIS	CENTRAL	Wind	110	110	Clarinda - Merryville 161kV tap
J614	NRIS	West	Wind	66	66	Rice 161kV Substation
J615	NRIS	West	Wind	70	70	Electric Farms- Shaulis 161kV
J637	NRIS	West	Wind	98	98	Big Stone - Brookings 345 kV
J638	NRIS	West	Wind	204	204	Big Stone - Brookings 345 kV
J302	NRIS	West	Wind	101	101	230kV Heskett-Wishek
J414	NRIS	West	Wind	200	200	Freeborn 161kV Substation on the Hayward - Freeborn - Winnebago 161kV line
J415	NRIS	West	Wind	200	200	New 345 kV Switchyard on the ROW of the proposed 345 kV Emery - Blackhawk line (MVP4)
J439	NRIS	West	Wind	500	500	Dickens, IA 51333 at O'Brien to Kossuth 345 kV
J457	NRIS	West	Wind	150	150	Merricourt Substation
J459	NRIS	West	Wind	200	200	Big Stone Brookings 345kV
J472	NRIS	SOUTH	Gas	923.8	1044.8	Near existing Entergy Lewis Creek Generating Power Plant
J503	NRIS	West	Wind	100	100	230 kV Heskett-Wishek, 20 miles NW of Wishek
J552	NRIS	SOUTH	Solar	100	100	Brinkley East - Moro 115kV Line
J553	NRIS	SOUTH	Solar	50	50	Sandy Creek - Jackson 69kV Line (Entergy)

Project	Service Type	DPP Region	Fuel Type	Net MW Size (Summer)	Net MW Size (Winter)	POI
J571	NRIS	MI	Gas	6.4	6.4	Township of Comstock, County of Kalamazoo, Morrow 138kV
J573	NRIS	CENTRAL	Solar	40	40	Belgrade 161kV
J581	NRIS	SOUTH	Solar	80	80	IpcO - Sterlington 115kV Line
J583	NRIS	West	Wind	200.1	200.1	MidAmerican Eclipse 345kV Substation
J589	NRIS	MI	Wind	200	200	Regal-Summerton 138kV line
J590	NRIS	West	Wind	90	90	Obrien - Kossuth 345 kV line
J596	NRIS	West	Wind	250	250	Morris -Moro 115kV Tap
J598	NRIS	CENTRAL	Wind	300	300	Zachary (Adair in PSSe case) – Ottumwa 345 kV Line
J613	NRIS	West	Wind	100	100	Jamestown Substation 115kV
J641	NRIS	CENTRAL	Solar	140	140	Line tap of Meredosia East sub to Jacksonville Industrial Park 138kv
J642	NRIS	CENTRAL	Solar	175	175	Whitesville 230kV sub
J644	NRIS	CENTRAL	Solar	110	110	Roodhouse NW 138kV
J648	External NRIS	CENTRAL	Gas	296	296	Existing Interconnection in SCEP switchyard at 138kV
J652	NRIS Only	ATC	Wind	98	98	Section 34 Township 3N Range 2E Seymour Township
J703	NRIS	MI	Gas	128.1	128.1	New sub looping lines FREG11 (National to Freeman) & Goose Lake (PI to Empire)
J704	NRIS	MI	Gas	54.9	54.9	M38 Substation 138 kV
J711	NRIS	MI	Wind	130	130	M38 Substation 138 kV

2. Summer Peak Analysis

- Model used – PJM AB2 Queue 2020 Summer Peak case. All Active PJM queue projects modeled through the AB2 Queue along with all previously studied MISO DPP projects. The MISO 2016 August DPP generators being studied were added to this model.
- Contingencies used – All PJM single contingencies and multiple facility contingencies (tower, bus fault, fault with stuck breaker)
- Monitored areas – All PJM areas
- Analysis type – PJM Generation Deliverability Test as described in PJM Manual 14B.
- MISO ERIS Projects were modeled as PJM Energy-Only projects.
- MISO NRIS Projects were modeled as PJM Capacity projects.
- Generators were scaled to their respective capacity portions for base case (N-0) and all single contingencies.
- Generators were scaled to their respective summer energy-only capabilities for multiple facility contingencies only.
- MISO Classic generation sunk to MISO Classic
- MISO South generation sunk to MISO South
- PJM generation sunk to PJM

3. Summer Peak Results :

1. (MISO – ATSI) The 19MON12 - 02LALLENDORF 345 kV line (264612-241901 ckt 1) loads from 93.75% to 103.33% (AC power flow) of its emergency rating (1494 MVA) for the tower contingency outage of 'P71:345:ITCT:DCT:MOROCCO:MILAN:MON34:1:LEMOYN:MAJTC:1'

CONTINGENCY 'P71:345:ITCT:DCT:MOROCCO:MILAN:MON34:1:LEMOYN:MAJTC:1'

OPEN BRANCH FROM BUS 264594 TO BUS 265227 CKT 1 / 264594 19LULU 345 264613
19MON34 345 1

OPEN BRANCH FROM BUS 264594 TO BUS 264839 CKT 1 / 264594 19LULU 345 264839
19MILAN 345 1

OPEN BRANCH FROM BUS 256583 TO BUS 264594 CKT 1 / 256583 18MOROCCO 345
264594 19LULU 345 1

OPEN BRANCH FROM BUS 238889 TO BUS 264599 CKT 1 / 238889 02LEMOYN 345
264599 19MAJTC 345 1

END

2. (AEP – AEP) The 05BENTON- 05BENTON 345/138 kV transformer (243212-243250 1) loads from 104.64% to 120.22% (AC power flow) of its emergency rating (564 MVA) for the breaker contingency outage of '7027_C2_05COOK 345-N'

CONTINGENCY '7027_C2_05COOK 345-N'

OPEN BRANCH FROM BUS 243212 TO BUS 243215 CKT 1 / 243212 05BENTON 345
243215 05COOK 345 1
OPEN BRANCH FROM BUS 243215 TO BUS 247502 CKT 2 / 243215 05COOK 345 247502
T-094 345 2
END

3. (AEP – AEP) The 05BENTON- 05BENTON 345/138 transformer (243212-243250 1) loads from 104.64% to 120.22% (AC power flow) of its emergency rating (564 MVA) for the tower contingency outage of '7027'

CONTINGENCY '7027'
OPEN BRANCH FROM BUS 243212 TO BUS 243215 CKT 1 / 243212 05BENTON 345
243215 05COOK 345 1
OPEN BRANCH FROM BUS 243215 TO BUS 247502 CKT 2 / 243215 05COOK 345 247502
T-094 345 2
END

4. (AEP – AEP) The 05DEQUIN- 05MEADOW 345kV line (243217-243878 2) loads from 161.85% to 162.63% (AC power flow) of its emergency rating (1304 MVA) for the breaker contingency outage of '4704_C2_05DEQUIN 345-B1'

CONTINGENCY '4704_C2_05DEQUIN 345-B1'
OPEN BRANCH FROM BUS 243217 TO BUS 243878 CKT 1 / 243217 05DEQUIN 345
243878 05MEADOW 345 1
OPEN BRANCH FROM BUS 243217 TO BUS 249525 CKT 1 / 243217 05DEQUIN 345
249525 08WESTWD 345 1
END

5. (AEP – AEP) The 05DEQUIN- 05MEADOW 345kV line (243217-243878 2) loads from 152.55% to 153.69% (AC power flow) of its normal rating (971 MVA) for the single contingency outage of '6472_B2_TOR15258'

CONTINGENCY '6472_B2_TOR15258'
OPEN BRANCH FROM BUS 243217 TO BUS 243878 CKT 1 / 243217 05DEQUIN 345
243878 05MEADOW 345 1
END

6. (MISO – AEP) The 17STILLWELL- 05DUMONT 345kV line (255113-243219 1) loads from 160.55% to 165.16% (AC power flow) of its emergency rating (1409 MVA) for the breaker contingency outage of '2978_C2_05DUMONT 765-B_A'

CONTINGENCY '2978_C2_05DUMONT 765-B_A'
OPEN BRANCH FROM BUS 243206 TO BUS 920251 CKT 1 / 243206 05DUMONT 765
920251 X1-020 TAP 765 1

OPEN BRANCH FROM BUS 243206 TO BUS 270644 CKT 1 / 243206 05DUMONT 765
270644 WILTON ; 765 1
END

7. (MISO – AEP) The 17STILLWELL- 05DUMONT 345kV line (255113-243219 1) loads from 120.86% to 125.6% (AC power flow) of its normal rating (1409 MVA) for the single contingency outage of '695_B2'

CONTINGENCY '695_B2'

OPEN BRANCH FROM BUS 243206 TO BUS 270644 CKT 1 / 243206 05DUMONT 765
270644 WILTO; 765 1
END

8. (ComED – AEP) The WILTON ; - 05DUMONT 765kV line (270644-243206 1) loads from 105.7% to 115.05% (AC power flow) of its normal rating (4047 MVA) for the single contingency outage of '697_B2'

CONTINGENCY '697_B2'

OPEN BRANCH FROM BUS 243229 TO BUS 274804 CKT 1 / 243229 05OLIVE 345
274804 UPNOR;RP 345 1
END

9. (ComED – AEP) The WILTON ; - 05DUMONT 765kV line (270644-243206 1) loads from 105.53% to 114.85% (AC power flow) of its normal rating (4047 MVA) for the single contingency outage of '345-L94507_B-S'

CONTINGENCY '345-L94507_B-S'

TRIP BRANCH FROM BUS 274750 TO BUS 255112 CKT 1 / CRETE;BP 345
17STJOHN 345
END

10. (ComED – AEP) The WILTON ; - 05DUMONT 765kV line (270644-243206 1) loads from 126.69% to 140.03% (AC power flow) of its emergency rating (4444 MVA) for the tower contingency outage of '345-L94507_B-S+_345-L97008_R-S'

CONTINGENCY '345-L94507_B-S+_345-L97008_R-S'

TRIP BRANCH FROM BUS 274750 TO BUS 255112 CKT 1 / CRETE;BP 345
17STJOHN 345
TRIP BRANCH FROM BUS 274804 TO BUS 243229 CKT 1 / UPNOR;RP 345 05OLIVE
345
END

11. (ComED – AEP) The WILTON ; - 05DUMONT 345kV line (270644-243206 1) loads from 125.43% to 138.76% (AC power flow) of its emergency rating (4444 MVA) for the tower contingency outage of '345-L6607__B-S+_345-L97008_R-S'

CONTINGENCY '345-L6607__B-S+_345-L97008_R-S'

TRIP BRANCH FROM BUS 270728 TO BUS 274750 CKT 1 / E FRA; B 345 CRETE;BP 345
TRIP BRANCH FROM BUS 274804 TO BUS 243229 CKT 1 / UPNOR;RP 345 05OLIVE 345
END

12. (ComED – AEP) The UNIV PK N;RP;- 05OLIVE 345 kV line (274804-243229 1) loads from 131.35% to 133.1% (AC power flow) of its emergency rating (971 MVA) for the breaker contingency outage of '2978_C2_05DUMONT 765-B_A'

CONTINGENCY '2978_C2_05DUMONT 765-B_A'

OPEN BRANCH FROM BUS 243206 TO BUS 920251 CKT 1 / 243206 05DUMONT 765
920251 X1-020 TAP 765 1

OPEN BRANCH FROM BUS 243206 TO BUS 270644 CKT 1 / 243206 05DUMONT 765
270644 WILTON ; 765 1
END

13. (ComED – AEP) The UNIV PK N;RP;- 05OLIVE 345 kV line (274804-243229 1) loads from 130.39% to 132.15% (AC power flow) of its emergency rating (971 MVA) for the breaker contingency outage of '112-65-BT4-5__'

CONTINGENCY '112-65-BT4-5__'

TRIP BRANCH FROM BUS 270644 TO BUS 243206 CKT 1 / WILTO; 765 05DUMONT 765
TRIP BRANCH FROM BUS 275233 TO BUS 270644 CKT 1 / WILTO;4M 345 WILTO; 765
TRIP BRANCH FROM BUS 275233 TO BUS 270927 CKT 1 / WILTO;4M 345 WILTO; R
345
TRIP BRANCH FROM BUS 275233 TO BUS 275333 CKT 1 / WILTO;4M 345 WILTO;4C 33
END

14. (ComED – AEP) The UNIV PK N;RP;- 05OLIVE 345 kV line (274804-243229 1) loads from 115.06% to 116.82% (AC power flow) of its emergency rating (971 MVA) for the breaker contingency outage of '695_B2'

CONTINGENCY '695_B2'

OPEN BRANCH FROM BUS 243206 TO BUS 270644 CKT 1 / 243206 05DUMONT 765 270644
WILTO; 765 1
END

15. (MISO – AEP) The 7CASEY;- 05SULLIVAN 345 kV line (346809-247712 1) loads from 115.21% to 117.34% (AC power flow) of its emergency rating (1334 MVA) for the breaker contingency outage of '695_B2'

CONTINGENCY '695_B2'

OPEN BRANCH FROM BUS 243206 TO BUS 270644 CKT 1 / 243206 05DUMONT 765 270644
WILTO; 765 1
END

16. (ComED – MISO) The BURNHAM ;OR 17MUNSTER 345 kV line (270677-255109 1) loads from 122.2% to 125.41% (AC power flow) of its emergency rating (1195 MVA) for the breaker contingency outage of '2978_C2_05DUMONT 765-B_A'

CONTINGENCY '2978_C2_05DUMONT 765-B_A'

OPEN BRANCH FROM BUS 243206 TO BUS 920251 CKT 1 / 243206 05DUMONT 765
920251 X1-020 TAP 765 1

OPEN BRANCH FROM BUS 243206 TO BUS 270644 CKT 1 / 243206 05DUMONT 765
270644 WILTON ; 765 1
END

17. (ComED –ComED) The CHERRY VA; B GARDEN PR; R 345 kV line (270694-270759 1) loads from 121.3% to 123.5% (AC power flow) of its emergency rating (1479 MVA) for the single contingency outage of '345-L0626__B-R_B'

CONTINGENCY '345-L0626__B-R_B'

TRIP BRANCH FROM BUS 923001 TO BUS 270916 CKT 1 / AB1-089 TAP WAYNE ; B
345
END

18. (ComED –ComED) The CHERRY VA; B GARDEN PR; R 345 kV line (270694-270759 1) loads from 102.52% to 104.1% (AC power flow) of its normal rating (1201 MVA) for the base case contingency.

19. (ComED –ComED) The CORDOVA ; B NELSON ; B 345 kV line (270700-270828 1) loads from 87.32% to 112.35% (AC power flow) of its emergency rating (2058 MVA) for the single contingency outage of '345-L0404____-R'

CONTINGENCY '345-L0404____-R'

TRIP BRANCH FROM BUS 270864 TO BUS 270890 CKT 1 / QUAD3-11 345 H471 ; 345
END

20. (ComED –ComED) The CORDOVA ; B NELSON ; B 345 kV line (270700-270828 1) loads from 87.25% to 112.29% (AC power flow) of its emergency rating (2058 MVA) for the single contingency outage of '345-L15504____-R'

CONTINGENCY '345-L15504____-R'

TRIP BRANCH FROM BUS 270828 TO BUS 270890 CKT 1 / NELSO; B 345 H471 ; 345
END

21. (ComED –ComED) The E FRANKFO; B ; CRETE EC ;BP; R 345 kV line (270728- 274750 1) loads from 107.83% to 115.84% (AC power flow) of its load dump rating (1674 MVA) for the breaker contingency outage of '112-65-BT4-5__'

CONTINGENCY '112-65-BT4-5__'

TRIP BRANCH FROM BUS 270644 TO BUS 243206 CKT 1 / WILTO; 765 05DUMONT 765
 TRIP BRANCH FROM BUS 275233 TO BUS 270644 CKT 1 / WILTO;4M 345 WILTO; 765
 TRIP BRANCH FROM BUS 275233 TO BUS 270927 CKT 1 / WILTO;4M 345 WILTO; R
 345
 TRIP BRANCH FROM BUS 275233 TO BUS 275333 CKT 1 / WILTO;4M 345 WILTO;4C 33
 END

22. (ComED –ComED) The E FRANKFO; B ; CRETE EC ;BP; R 345 kV line (270728- 274750 1) loads from 107.78% to 115.78% (AC power flow) of its load dump rating (1674 MVA) for the single contingency outage of '112-65-BT3-4__'

CONTINGENCY '112-65-BT3-4__'

TRIP BRANCH FROM BUS 270644 TO BUS 243206 CKT 1 / WILTO; 765 05DUMONT 765
 TRIP BRANCH FROM BUS 275232 TO BUS 270644 CKT 1 / WILTO;3M 345 WILTO; 765
 TRIP BRANCH FROM BUS 275232 TO BUS 270926 CKT 1 / WILTO;3M 345 WILTO; B 345
 TRIP BRANCH FROM BUS 275232 TO BUS 275332 CKT 1 / WILTO;3M 345 WILTO;3C 33
 END

23. (ComED –ComED) The E FRANKFO; B ; CRETE EC ;BP; R 345 kV line (270728- 274750 1) loads from 100.47% to 109.3% (AC power flow) of its emergency rating (1399 MVA) for the single contingency outage of '695_B2'

CONTINGENCY '695_B2'

OPEN BRANCH FROM BUS 243206 TO BUS 270644 CKT 1 / 243206 05DUMONT 765 270644
 WILTO; 765 1
 END

24. (ComED –ComED) The GARDEN PR; R; SILVER LK; R 345 kV line (270759- 270883 1) loads from 121.46% to 123.66% (AC power flow) of its emergency rating (1479 MVA) for the single contingency outage of '345-L0626__B-R_B'

CONTINGENCY '345-L0626__B-R_B'

TRIP BRANCH FROM BUS 923001 TO BUS 270916 CKT 1 / AB1-089 TAP WAYNE ; B
 345
 END

25. (ComED –ComED) The GARDEN PR; R; SILVER LK; R 345 kV line (270759- 270883 1) loads from 107.23% to 108.81% (AC power flow) of its normal rating (1201 MVA) for the base case single contingency outage

26. (ComED –ComED) The GARDEN PR; R; SILVER LK; R 345 kV line (270759- 270883 1) loads from 104.97% to 107.17% (AC power flow) of its emergency rating (1479 MVA) for the single contingency outage of '345-L0626__B-R_A'

CONTINGENCY '345-L0626__B-R_A'

TRIP BRANCH FROM BUS 270678 TO BUS 923001 CKT 1 / BYRON ; B 345 AB1-089 TAP
END

27. (ComED –ComED) The NELSON ; B; LEE CO EC;BP 345 kV line (270828- 274768 1) loads from
106.38% to 126.35% (AC power flow) of its load dump rating (1768 MVA) for the breaker contingency
outage of '155-45-BT2-34_'

CONTINGENCY '155-45-BT2-34_'

TRIP BRANCH FROM BUS 270828 TO BUS 270932 CKT 1 / NELSO; B 345 WALTO; B 345
TRIP BRANCH FROM BUS 270828 TO BUS 272094 TO BUS 275341 CKT 1 / NELSO; B 345 NELSO;
B 138 NELSO;1C 34.5
END

28. (ComED –ComED) The NELSON ; B; LEE CO EC;BP 345 kV line (270828- 274768 1) loads from
106.01% to 129.59% (AC power flow) of its emergency rating (1479 MVA) for the single contingency
outage of '345-L15502_B-R'

CONTINGENCY '345-L15502_B-R'

TRIP BRANCH FROM BUS 270828 TO BUS 270932 CKT 1 / NELSO; B 345 WALTO; B 345
END

29. (ComED –ComED) The NELSON ; B; LEE CO EC;BP 345 kV line (270828- 274768 1) loads from
106.00% to 129.58% (AC power flow) of its emergency rating (1479 MVA) for the single contingency
outage of '345-L18402_B-R'

CONTINGENCY '345-L18402_B-R'

TRIP BRANCH FROM BUS 270932 TO BUS 270730 CKT 1 / WALTO; B 345 ELECT; B 345
END

30. (ComED –ComED) The NELSON ; B; LEE CO EC;BP 345 kV line (270828- 274768 1) loads from
105.78% to 125.73% (AC power flow) of its load dump rating (1768 MVA) for the tower contingency
outage of '138-L11106_B-R+_345-L15502_B-R'

CONTINGENCY '138-L11106_B-R+_345-L15502_B-R'

TRIP BRANCH FROM BUS 271390 TO BUS 271586 CKT 1 / ELECT; B 138 W541 ; B 138
TRIP BRANCH FROM BUS 271560 TO BUS 271558 CKT 1 / GLIDD;BT 138 GLIDD; B 138
TRIP BRANCH FROM BUS 271560 TO BUS 272728 CKT 1 / GLIDD;BT 138 WATER; B 138
TRIP BRANCH FROM BUS 271586 TO BUS 272114 CKT 1 / W541 ; B 138 N AUR; B 138
TRIP BRANCH FROM BUS 272114 TO BUS 272522 CKT 1 / N AUR; B 138 SUGAR; B 138
TRIP BRANCH FROM BUS 272522 TO BUS 271560 CKT 1 / SUGAR; B 138 GLIDD;BT 138
MOVE 100 PERCENT LOAD FROM BUS 271586 TO BUS 271587 / W541 ; B 138 W541 ; R 138
MOVE 100 PERCENT LOAD FROM BUS 272522 TO BUS 272523 / SUGAR; B 138 SUGAR; R

CLOSE LINE FROM BUS 272114 TO BUS 272115 CKT 1 / N AUR; B 138 N AUR; R 138
TRIP BRANCH FROM BUS 270828 TO BUS 270932 CKT 1 / NELSO; B 345 WALTO; B 345
END

31. (ComED –ComED) The NELSON ; B; WALTO; B 345 kV line (270828- 270932 1) loads from 137.40% to 158.06% (AC power flow) of its emergency rating (1528 MVA) for the single contingency outage of '345-L0626__B-R_B'

CONTINGENCY '345-L0626__B-R_B'
TRIP BRANCH FROM BUS 923001 TO BUS 270916 CKT 1 / AB1-089 TAP WAYNE ; B 345
END

32. (ComED –ComED) The NELSON ; B; WALTO; B 345 kV line (270828- 270932 1) loads from 128.55% to 153.33% (AC power flow) of its emergency rating (1528 MVA) for the single contingency outage of '345-L0627__B-R'

CONTINGENCY '345-L0627__B-R'
TRIP BRANCH FROM BUS 274768 TO BUS 270678 CKT 1 / LEECO;BP 345 BYRON; B 345
END

33. (ComED –ComED) The PONTIAC ; R; DRESDEN ; R 345 kV line (270853- 270717 1) loads from 119.87% to 123.47% (AC power flow) of its emergency rating (1481 MVA) for the single contingency outage of '345-L11212__B-S'

CONTINGENCY '345-L11212__B-S'
TRIP BRANCH FROM BUS 270926 TO BUS 270704 CKT 1 / WILTO; B 345 LORET; B 345
END

34. (ComED –ComED) The PONTIAC ; R; DRESDEN ; R 345 kV line (270853- 270717 1) loads from 117.8% to 121.40% (AC power flow) of its emergency rating (1481 MVA) for the single contingency outage of '345-L8012__B-S'

CONTINGENCY '345-L8012__B-S'
TRIP BRANCH FROM BUS 270852 TO BUS 270704 CKT 1 / PONTI; B 345 LORET; B 345
END

35. (ComED –ComED) The QUAD 1 3-11; ESS H471 ; 345 kV line (270864- 270890 1) loads from 89.36% to 114.99% (AC power flow) of its emergency rating (2011 MVA) for the single contingency outage of '345-L8012__B-S'

CONTINGENCY '345-L15503__B-R'

TRIP BRANCH FROM BUS 270828 TO BUS 270700 CKT 1 / NELSO; B 345 CORDO; B 345
END

36. (ComED –ComED) The ESS H471 ; T; NELSON ; B; 345 kV line (270890- 270828 1) loads from 87.23% to 112.27% (AC power flow) of its emergency rating (2058 MVA) for the single contingency outage of '345-L15503_B-R'

CONTINGENCY '345-L15503_B-R'

TRIP BRANCH FROM BUS 270828 TO BUS 270700 CKT 1 / NELSO; B 345 CORDO; B 345
END

37. (ComED –ComED) The WALTO; B; T; ELECT JCT; B; 345 kV line (270932- 270730 1) loads from 137.46% to 158.12% (AC power flow) of its emergency rating (1528 MVA) for the single contingency outage of '345-L0626__B-R_B'

CONTINGENCY '345-L0626__B-R_B'

TRIP BRANCH FROM BUS 923001 TO BUS 270916 CKT 1 / AB1-089 TAP WAYNE ; B 345
END

38. (ComED –ComED) The WALTO; B; T; ELECT JCT; B; 345 kV line (270932- 270730 1) loads from 128.6% to 153.38% (AC power flow) of its emergency rating (1528 MVA) for the single contingency outage of '345-L0627__B-R'

CONTINGENCY '345-L0627__B-R'

TRIP BRANCH FROM BUS 274768 TO BUS 270678 CKT 1 / LEECO;BP 345 BYRON; B 345
END

39. (ComED –MISO) The CRETE EC ;BP ; 17STJOHN ; 345 kV line (274750- 255112 1) loads from 141.17% to 150.74% (AC power flow) of its emergency rating (1399 MVA) for the breaker contingency outage of '112-65-BT4-5__'

CONTINGENCY '112-65-BT4-5__'

TRIP BRANCH FROM BUS 270644 TO BUS 243206 CKT 1 / WILTO; 765 05DUMONT 765
TRIP BRANCH FROM BUS 275233 TO BUS 270644 CKT 1 / WILTO;4M 345 WILTO; 765
TRIP BRANCH FROM BUS 275233 TO BUS 270927 CKT 1 / WILTO;4M 345 WILTO; R 345
TRIP BRANCH FROM BUS 275233 TO BUS 275333 CKT 1 / WILTO;4M 345 WILTO;4C 33
END

40. (ComED –MISO) The CRETE EC ;BP ; 17STJOHN ; 345 kV line (274750- 255112 1) loads from 141.10% to 150.68% (AC power flow) of its emergency rating (1399 MVA) for the breaker contingency outage of '112-65-BT3-4__'

CONTINGENCY '112-65-BT3-4__'

TRIP BRANCH FROM BUS 270644 TO BUS 243206 CKT 1 / WILTO; 765 05DUMONT 765
TRIP BRANCH FROM BUS 275232 TO BUS 270644 CKT 1 / WILTO;3M 345 WILTO; 765
TRIP BRANCH FROM BUS 275232 TO BUS 270926 CKT 1 / WILTO;3M 345 WILTO; B 345
TRIP BRANCH FROM BUS 275232 TO BUS 275332 CKT 1 / WILTO;3M 345 WILTO;3C 33

END

41. (ComED –MISO) The CRETE EC ;BP ; 17STJOHN ; 345 kV line (274750- 255112 1) loads from 122.95% to 131.78% (AC power flow) of its emergency rating (1399 MVA) for the single contingency outage of '695_B2'

CONTINGENCY '695_B2'

OPEN BRANCH FROM BUS 243206 TO BUS 270644 CKT 1 / 243206 05DUMONT 765 270644
WILTO; 765 1
END

42. (ComED –ComED) The LEE CO EC;BP; BYRON ; B; 345 kV line (274768- 270678 1) loads from 114.37% to 131.31% (AC power flow) of its load dump rating (2084 MVA) for the breaker contingency outage of '155-45-BT2-34_'

CONTINGENCY '155-45-BT2-34_'

TRIP BRANCH FROM BUS 270828 TO BUS 270932 CKT 1 / NELSO; B 345 WALTO; B 345
TRIP BRANCH FROM BUS 270828 TO BUS 272094 TO BUS 275341 CKT 1 / NELSO; B 345 NELSO;
B 138 NELSO;1C 34.5
END

43. (ComED –ComED) The LEE CO EC;BP; BYRON ; B; 345 kV line (274768- 270678 1) loads from 125.5% to 145.42% (AC power flow) of its emergency rating (1726 MVA) for the single contingency outage of '345-L15502_B-R'

CONTINGENCY '345-L15502_B-R'

TRIP BRANCH FROM BUS 270828 TO BUS 270932 CKT 1 / NELSO; B 345 WALTO; B 345
END

44. (ComED –ComED) The LEE CO EC;BP; BYRON ; B; 345 kV line (274768- 270678 1) loads from 105.19% to 112.59% (AC power flow) of its normal rating (1334 MVA) for the base case contingency

45. (ComED –ComED) The LEE CO EC;BP; BYRON ; B; 345 kV line (274768- 270678 1) loads from 125.49% to 145.41% (AC power flow) of its emergency rating (1726 MVA) for the single contingency outage of '345-L18402_B-R'

CONTINGENCY '345-L18402_B-R'

TRIP BRANCH FROM BUS 270932 TO BUS 270730 CKT 1 / WALTO; B 345 ELECT; B 345
END

46. (ComED –ComED) The LEE CO EC;BP; BYRON ; B; 345 kV line (274768- 270678 1) loads from 113.87% to 130.79% (AC power flow) of its load dump rating (2084 MVA) for the tower contingency outage of '138-L11106_B-R+_345-L15502_B-R'

CONTINGENCY '138-L11106_B-R+_345-L15502_B-R'

TRIP BRANCH FROM BUS 271390 TO BUS 271586 CKT 1	/ ELECT; B 138 W541 ; B 138
TRIP BRANCH FROM BUS 271560 TO BUS 271558 CKT 1	/ GLIDD;BT 138 GLIDD; B 138
TRIP BRANCH FROM BUS 271560 TO BUS 272728 CKT 1	/ GLIDD;BT 138 WATER; B 138
TRIP BRANCH FROM BUS 271586 TO BUS 272114 CKT 1	/ W541 ; B 138 N AUR; B 138
TRIP BRANCH FROM BUS 272114 TO BUS 272522 CKT 1	/ N AUR; B 138 SUGAR; B 138
TRIP BRANCH FROM BUS 272522 TO BUS 271560 CKT 1	/ SUGAR; B 138 GLIDD;BT 138
MOVE 100 PERCENT LOAD FROM BUS 271586 TO BUS 271587	/ W541 ; B 138 W541 ; R 138
MOVE 100 PERCENT LOAD FROM BUS 272522 TO BUS 272523	/ SUGAR; B 138 SUGAR; R
138	
CLOSE LINE FROM BUS 272114 TO BUS 272115 CKT 1	/ N AUR; B 138 N AUR; R 138
TRIP BRANCH FROM BUS 270828 TO BUS 270932 CKT 1	/ NELSO; B 345 WALTO; B 345
END	

47. (MISO –ComED) The PLS PR1; ZION STA ; R; 345 kV line (699432- 270941 1) loads from 112% to 114.18% (AC power flow) of its emergency rating (1528 MVA) for the breaker contingency outage of '974-45-BT1-2__'

CONTINGENCY '974-45-BT1-2__'

TRIP BRANCH FROM BUS 270941 TO BUS 274817 CKT 1	/ ZION ; R 345 ZIONE;RP 345
TRIP BRANCH FROM BUS 274817 TO BUS 270807 CKT 1	/ ZIONE;RP 345 LIBER; R 345
END	

48. (ComED –ComED) The AB1-089 TAP; WAYNE ; B 345 kV line (923001- 270916 1) loads from 106.8% to 109.49% (AC power flow) of its emergency rating (2058 MVA) for the single contingency outage of '345-L97116__-R'

CONTINGENCY '345-L97116__-R'

TRIP BRANCH FROM BUS 270759 TO BUS 270883 CKT 1	/ U3-021 SILVE; R 345
END	

49. (ComED –ComED) The AB1-089 TAP; WAYNE ; B 345 kV line (923001- 270916 1) loads from 101.94% to 103.18% (AC power flow) of its normal rating (1679 MVA) for the base case contingency outage

50. (ComED –ComED) The AB1-089 TAP; WAYNE ; B 345 kV line (923001- 270916 1) loads from 103.32% to 106.01% (AC power flow) of its emergency rating (2058 MVA) for the single contingency outage of '345-L15616__-R'

CONTINGENCY '345-L15616__-R'

TRIP BRANCH FROM BUS 270694 TO BUS 270759 CKT 1	/ CHERR; B 345 U3-021 GARDEN
PRAIRIE	

END

51. (ComED –ComED) The AB1-122 TAP; KENDALL ;BU345 kV line (930760- 274702 1) loads from 109.98% to 111.62% (AC power flow) of its load dump rating (1768 MVA) for the breaker contingency outage of '012-45-BT4-5__A'

CONTINGENCY '012-45-BT4-5__A'

TRIP BRANCH FROM BUS 270716 TO BUS 930770 CKT 1 / DRESDEN ; B 345 AB1-122 TAP
TRIP BRANCH FROM BUS 270716 TO BUS 270736 CKT 1 / DRESD; B 345 ELWOO; B 345
TRIP BRANCH FROM BUS 270736 TO BUS 270737 CKT 1 / ELWOO; B 345 ELWOO; R 345
END

52. (ComED –ComED) The AB1-122 TAP; KENDALL ;BU345 kV line (930760- 274702 1) loads from 117.64% to 119.6% (AC power flow) of its emergency rating (1479 MVA) for the single contingency outage of '345-L1202__B-S_A'

CONTINGENCY '345-L1202__B-S_A'

TRIP BRANCH FROM BUS 270716 TO BUS 930770 CKT 1 / DRESDEN ; B 345 AB1-122 TAP
END

53. (ComED –ComED) The AB1-122 TAP; DRESDEN ; B345 kV line (930760- 274702 1) loads from 124.69% to 126.76% (AC power flow) of its emergency rating (1479 MVA) for the single contingency outage of '345-L93505_B-S_A'

CONTINGENCY '345-L93505_B-S_A'

TRIP BRANCH FROM BUS 274702 TO BUS 930760 CKT 1 / KENDA;BU 345 AB1-122 TAP
TRIP BRANCH FROM BUS 274702 TO BUS 274703 CKT 1 / KENDA;BU 345 KENDA;RU 345
END

54. (ComED –ComED) The AB1-122 TAP; DRESDEN ; B345 kV line (930760- 274702 1) loads from 122.34% to 123.44% (AC power flow) of its load dump rating (1768 MVA) for the tower contingency outage of '345-L10805_B-S+_345-L10806_R-S'

CONTINGENCY '345-L10805_B-S+_345-L10806_R-S'

TRIP BRANCH FROM BUS 270810 TO BUS 274702 CKT 1 / LOCKP; B 345 KENDA;BU 345
TRIP BRANCH FROM BUS 274703 TO BUS 270811 CKT 1 / KENDA;RU 345 LOCKP; R 345
END

55. (MISO –MISO) The 7NEWTON; 7CASEY ; B345 kV line (347830- 346809 1) loads from 107.25% to 107.46% (AC power flow) of its normal rating (1200 MVA) for the base case contingency outage

56. (MISO –MISO) The 7NEWTON; 7CASEY ; B345 kV line (347830- 346809 1) loads from 101.16% to 101.36% (AC power flow) of its emergency rating (1319 MVA) for the single contingency outage of 'SPS-2105&U1____'

CONTINGENCY 'SPS-2105&U1____'

TRIP BRANCH FROM BUS 270797 TO BUS 347945 CKT 1 / KINCA; R 345 7PANA 345

TRIP BRANCH FROM BUS 347945 TO BUS 346895 CKT 1 / 7PANA 345 7COFFEEN 345

REMOVE UNIT 1 FROM BUS 274650 / KINCA;1U 20

END

57. (MISO –MISO) The 7NEWTON; 7CASEY ; B345 kV line (347830- 346809 1) loads from 100.59% to 100.78% (AC power flow) of its emergency rating (1319 MVA) for the single contingency outage of '4839_B1_05ROCKPT 765-1'

CONTINGENCY '4839_B1_05ROCKPT 765-1'

OPEN BRANCH FROM BUS 243209 TO BUS 243442 CKT 1 / 243209 05ROCKPT 765 243442
05RKG1 26.0 1

REMOVE UNIT 1H FROM BUS 243442 / 243442 05RKG1 26.0

REMOVE UNIT 1L FROM BUS 243442 / 243442 05RKG1 26.0

END

4. Light Load analysis

- Model used – PJM AB2 Queue 2020 Light Load case. All Active PJM queue projects modeled through the AB2 Queue along with all previously studied MISO DPP projects. The MISO 2016 August DPP generators being studied were added to this model.
- Contingencies used – All PJM single contingencies and multiple facility contingencies (tower, bus fault, fault with stuck breaker)
- Monitored areas – All PJM areas
- Analysis type – PJM Generation Deliverability Test
- Analysis type – Light Load Generation Deliverability
 - MISO wind generators were scaled to 100% of their respective total capabilities for base case, category B, and category C events
 - Coal generators ≥ 500 MW were scaled to 60% and < 500 MW were scaled to 45% of their respective total capabilities for base case, category B, and category C events
- MISO Classic generation sunk to MISO Classic
- MISO South generation sunk to MISO South
- PJM generation sunk to PJM

5. Light Load Results:

1. (AEP-AEP) The 05COOK – T-094 345kV line (from bus 243215 to bus 256000 ckt 2) loads from 98.45% to 125.31% of its normal rating 1409MVA for the single line contingency outage of '7021_B2_TOR7901689B'.

CONTINGENCY '7021_B2_TOR7901689B'

OPEN BRANCH FROM BUS 243212 TO BUS 247502 CKT 1 / 243212 05BENTON 345
247502 T-094 345 1
END

Contribution to Previously Identified Overloads

1. (AEP-MISO) The 05TWIN B – 18ARGNTA 345kV line (from bus 243234 to bus 256000 ckt 1) loads from 103.67% to 130.50% of its emergency rating 1409MVA for the tower contingency outage of '7030'.

CONTINGENCY '7030'

OPEN BRANCH FROM BUS 243212 TO BUS 247502 CKT 1 / 243212 05BENTON 345
247502 T-094 345 1
OPEN BRANCH FROM BUS 243215 TO BUS 247502 CKT 2 / 243215 05COOK 345
247502 T-094 345 2
END

2. (AEP-MISO) The 05TWIN B – 18ARGNTA 345kV line (from bus 243234 to bus 256000 ckt 1) loads from 103.67% to 130.50% of its emergency rating 1409MVA for the fault at stuck breaker contingency outage of '7042_C2_05T094 345-'.

CONTINGENCY '7042_C2_05T094 345-'

OPEN BRANCH FROM BUS 243212 TO BUS 247502 CKT 1 / 243212 05BENTON 345
247502 T-094 345 1
OPEN BRANCH FROM BUS 243215 TO BUS 247502 CKT 2 / 243215 05COOK 345
247502 T-094 345 2
END

3. (AEP-AEP) The 05BENTON – T-094 345kV line (from bus 243212 to bus 247502 ckt 1) loads from 101.64% to 129.90% of its normal rating 1409MVA for the single line contingency outage of '7023_B2_TOR8101690'.

CONTINGENCY '7023_B2_TOR8101690'

OPEN BRANCH FROM BUS 243215 TO BUS 247502 CKT 2 / 243215 05COOK 345
247502 T-094 345 2
END

4. (ComEd-ComEd) The LORETTO ; B – WILTON ; B 345kV line (from bus 270704 to bus 270926 ckt 1) loads from 112.26% to 114.5% of its emergency rating 1280MVA for the single line contingency outage of '345-L8014_T_-S'.

CONTINGENCY '345-L8014_T_-S'

TRIP BRANCH FROM BUS 270853 TO BUS 270717 CKT 1 / PONTIAC ; R 345 DRESDEN
; R 345
TRIP BRANCH FROM BUS 275210 TO BUS 270853 CKT 1 / PONTIAC ;2M 138
PONTIAC ; R 345
TRIP BRANCH FROM BUS 275210 TO BUS 272261 CKT 1 / PONTIAC ;2M 138
PONTIAC ; R 138
TRIP BRANCH FROM BUS 275210 TO BUS 275310 CKT 1 / PONTIAC ;2M 138
PONTIAC ;2C 34.5
CLOSE BRANCH FROM BUS 272260 TO BUS 272261 CKT 1 / PONTIAC ; B 138
PONTIAC ; R 138
END

6. Required System Upgrades & Cost Estimates/Allocations:

1. To relieve the 19MON12 – Lallendorf 345 kV line overload:

The MISO-end SE rating is 1702 MVA. No MISO-end upgrade needed.

ATSI upgrade is to upgrade the span over the Maumee River to bring the ATSI-end ratings to 1486/1824 MVA SN/SE. Cost estimate is \$1M. PJM Network Upgrade N5313.

The cost allocation is as follows:

1			
Queue	MW contribution	Percentage of Cost	\$ cost (\$ 1.0 M)
J572	17.9	12.56%	0.1256
J601	28.4	19.96%	0.1996
J602	43.3	30.40%	0.3040
J608	15.1	10.60%	0.1060
J589	37.8	26.49%	0.2649

2. To relieve the Benton 345/138 kV transformer overloads:

Upgrade is to add a 2nd Benton 345/138 kV XFMR at a cost of \$3.5M. PJM Network Upgrade N4731.

The following 2016 August DPP projects contribute loading to the Benton transformer overload: J572, J601, J602, J608, J609, J589.

Per PJM cost allocation rules, the 2016 August DPP projects presently do not receive any cost allocation for this upgrade.

As changes to the PJM Interconnection Process occur (such as PJM or MISO projects withdrawing from the queue), the 2016 August DPP projects could receive cost allocation towards this upgrade going forward.

3. To relieve the Dequine – Meadowlake 345 kV line #2 overloads:

The following 2016 August DPP projects contribute loading to Dequine – Meadowlake 345 kV line #2: J642.

There are planned baseline upgrades (B2668 and B2776) to reconductor the line, replace the Dequine riser and wavetrap, adjust Meadowlake relay trip limit. New ratings to be 1825/2062 MVA SN/SE in summer 2021.

Any project contributing to this overload will need a PJM interim study performed if coming into service prior to 6-1-2021 (B2668 and B2776).

Upgrade needed: Replace Meadowlake 3000 Amp wavetrap. New expected SE rating will be 2246 MVA. \$500K. PJM Network Upgrade N5314.

This upgrade is driven by a prior queue. Per PJM cost allocation rules, the 2016 August DPP projects presently does not receive cost allocation for this upgrade. Note: as changes to the interconnection process occur, such as prior queued projects withdrawing from the queue, the 2016 August DPP projects could receive cost allocation.

4. To relieve the Stillwell – Dumont 345 kV line overloads:

The following 2016 August DPP projects contribute loading to Stillwell – Dumont: J643, J592, J606, J614, J615, J415, J652.

- (N4058) Sag study results from Z1-043 & Z1-070 Facilities Studies: Stillwell - Dumont 345 kV line work will include the replacement of tower 20 with a custom steel pole, replacement of tower 24 with a custom H-frame and the removal of swing angle brackets on 2 structures. Cost estimate is \$1.613M. New SE rating will be 1718 MVA limited by a Dumont wavetrap and possibly the conductor.
 - This upgrade is driven by a prior queue. Per PJM cost allocation rules, the 2016 August DPP projects presently do not receive cost allocation for this upgrade. Note: as changes to the interconnection process occur, such as prior queued projects withdrawing from the queue, the 2016 August DPP projects could receive cost allocation.
- Additional AEP-end upgrade: Rebuild 8.6 miles of the AEP owned line and upgrade necessary Dumont terminal equipment (wavetrap) at a cost of \$20M. PJM Network Upgrade N4790. New AEP-end ratings to be 1409/2045 MVA (SN/SE). Limited by Dumont risers.
- Additional AEP-end upgrade: In addition to upgrading the Dumont risers, a different conductor (compared to the prior upgrade) will need to be selected to achieve the desired rating. The new conductor would be 1272 dual ACSR conductor. The additional cost for this work scope is \$2M. The new AEP-end ratings to be 1690/2278 MVA SN/SE (limited by the conductor). PJM Network Upgrade N5064.
- MISO end – ratings are 1409/1779 MVA. MISO end upgrade: Rebuild NIPSCO portion of line (2.87 miles) at a cost of \$6.5M and upgrade Stillwell substation equipment at a cost of \$1.5M. Total cost is \$8.0M. New expected MISO end ratings will be 1582/1898 MVA SN/SE.

Total cost of required upgrades needed: \$30 M

The cost allocation is as follows:

Queue	MW contribution	Percentage of Cost	\$ cost (\$30 M)
J351	145.7	14.69%	4.408
AB1-086	66.4	6.70%	2.009
AB1-089	77.0	7.77%	2.330
AB1-090	77.0	7.77%	2.330
AB1-091	91.5	9.23%	2.769
AB1-121 MTX	267.1	26.94%	8.082
AB1-122	172.2	17.37%	5.210
AB2-013 LTF	19.0	1.92%	0.575
AB2-096	49.6	5.00%	1.501
J643	26.0	2.62%	0.787

Additional MISO end upgrade: Reconductor 2.87 miles of transmission conductor to bundled 954 ACSS, replace substation conductor to bundled 2500 AL, and replace wavetrap. \$12M. New MISO-end ratings to be 2550/2923 MVA SN/SE.

The cost allocation is as follows:

Queue	MW contribution	Percentage of Cost	\$ cost (\$12 M)
AB1-086	66.4	7.85%	0.942
AB1-089	77.0	9.10%	1.092
AB1-090	77.0	9.10%	1.092
AB1-091	91.5	10.82%	1.298
AB1-121 MTX	267.1	31.58%	3.790
AB1-122	172.2	20.36%	2.443
AB2-013 LTF	19.0	2.25%	0.270
AB2-096	49.6	5.86%	0.704
J643	26.0	3.07%	0.369

Note: as changes to the interconnection process occur, such as prior queued projects withdrawing from the queue, other 2016 August DPP projects could receive cost allocation.

5. To relieve the Wilton – Dumont 765 kV line overloads:

AEP:

AEP-end SE rating is 4801 MVA.

AEP-end upgrade is to replace the Dumont wavetrap and relay compliance thermal limit to obtain new AEP-end ratings of 6198/7362 MVA (SN/SE) at a cost of \$1.5M. N4789.

This upgrade is driven by a prior queue. Per PJM cost allocation rules, the 2016 August DPP projects presently does not receive cost allocation for this upgrade. Note: as changes to the interconnection process occur, such as prior queued projects withdrawing from the queue, the 2016 August DPP projects could receive cost allocation.

ComEd:

The ComEd SSTE rating is 4553 MVA.

The ComEd ALDR rating is 5522 MVA.

ComEd upgrade: mitigate the sag on L11215. A preliminary estimate for this work is \$9M with an estimated construction timeline of 30 months. Upon completion of this work the new line ratings will be 3555/4105/4746/6493 MVA (SN/SLTE/SSTE/ALDR). PJM Network Upgrade N5252.

The following projects contribute to the Wilton – Dumont overloads and may receive cost allocation towards the \$9M upgrade:

J606,J592,J652,J614,J615,J415,J414,J596,J613,J457,J637,J638,J511,J459,J607,J302,J503,J575,J577,J587,J597,J594,J593,J512,J590,J569,J439,J599,J555,J456

The cost allocation is as follows:

Queue	MW contribution	% of Cost	Cost (\$9 M)
AB1-122	404.2	0.79	7.086
J501	56.8	0.11	0.996
J439	52.4	0.10	0.919

Note: as changes to the interconnection process occur, such as prior queued projects withdrawing from the queue, other 2016 August DPP projects could receive cost allocation.

6. To relieve the University Park – Olive 345 kV line overloads:

The following 2016 August DPP projects contribute loading to University Park – Olive: J592, J606, J652.

ComEd:

the SSTE is 1134 MVA and sufficient. The ALDR is 1423 MVA and sufficient. No ComEd-end upgrade needed.

AEP:

A sag check will be required for the ACSR/PE ~ 1414 ~ 62/19 ~ Conductor Section 1 to determine if the line section can be operated above its emergency rating of 971 MVA. The results could prove that no additional upgrades are necessary, that some upgrades on the circuit are necessary, or that the entire 40.61 mile section of line would need to be rebuilt. Estimated Cost: \$162,440 (2016 dollars). If deemed necessary to rebuild the entire 40.61 miles of the section of the line, Estimated Cost: \$81,220,000.

Schedule: (1) Sag Study: 6 to 12 months. (2) Rebuild: The standard time required for construction differs

from state to state. An approximate construction time would be 24 to 36 months after signing an interconnection agreement.

New AEP end ratings to be 971/1304 MVA SN/SE.

N4057

This upgrade is driven and needed for a prior queue.

Per PJM cost allocation rules, 2016 August DPP projects presently does not receive any cost allocation for this upgrade.

As changes to the PJM Interconnection Process occur (such as PJM or MISO projects withdrawing from the queue), the driver queue project can change and the 2016 August DPP projects could receive cost allocation towards this upgrade going forward.

AEP:

Rebuild/Reconductor 40.61 miles of the AEP owned section of the Olive - University Park (CE) 345 kV ACSR/PE 1414 62/19 line section 1. Estimated Cost to reconductor/rebuild AEP section of line: \$81.2 Million. The Olive switches to Line Riser will have to be replaced; Estimated Cost: \$1.4 Million.

New AEP end ratings to be 1342/1342 MVA SN/SE

PJM Network Upgrade N5303.

Per PJM cost allocation rules, the 2016 August DPP projects presently do not receive any cost allocation for this upgrade as they do not meet the cost allocation thresholds.

As changes to the PJM Interconnection Process occur (such as PJM or MISO projects withdrawing from the queue), the driver queue project can change and the 2016 August DPP projects could receive cost allocation towards this upgrade going forward.

7. To relieve the Casey – Sullivan 345 kV line overload:

The following 2016 August DPP projects contribute loading to Casey - Sullivan: J474, J573, J641, J644.

- a. MISO-end: The MISO-end SE rating is 1466 MVA and is sufficient. No upgrade needed on the MISO-end.
- b. AEP-end: The AEP-end SN rating is 1443 MVA and not sufficient. AEP Upgrade: 0.8 miles AEP line will be re-conducted which will increase the ratings to SN – 1930MVA and SE – 1930MVA. Cost – \$700K. PJM Network Upgrade N5251.

This upgrade is driven and needed for a prior queue.

Per PJM cost allocation rules, the 2016 August DPP projects presently do not receive any cost allocation for this upgrade.

As changes to the PJM Interconnection Process occur (such as PJM or MISO projects withdrawing from the queue), the driver queue project can change and the 2016 August DPP projects could receive cost allocation towards this upgrade going forward.

8. To relieve the Burnham – Munster 345 kV line overload:

The ComEd ALDR rating is 1572 MVA. No ComEd upgrade needed.

The MISO SE rating is 1195 MVA. Replace Munster switches and circuit breaker. Cost estimate is \$1.5M. New MISO end ratings to be 1201/1441 MVA (SN/SE).

This upgrade is driven and needed for a prior queue.

Per PJM cost allocation rules, the 2016 August DPP projects presently do not receive any cost allocation for this upgrade.

As changes to the PJM Interconnection Process occur (such as PJM or MISO projects withdrawing from the queue), the driver queue project can change and the 2016 August DPP projects could receive cost allocation towards this upgrade going forward.

The following 2016 August DPP projects contribute loading Burnham - Munster: J606, J592, J652, J614, J615, J415.

9. To relieve the Cherry Valley – Garden Prairie 345 kV line overloads:

The ComEd SN rating is 1201 MVA and the ComEd SSTE is 1568 MVA.

The upgrade is to re-conductor the existing line and upgrade terminal equipment at both ends. The preliminary estimate would be \$50M with an estimated construction timeline of 30-36 months. The post construction ratings would be 1461/1656/1909/1912/2199 MVA (SN/SLTE/SSTE/SLD/ALDR). PJM Network Upgrade N5315.

The following 2016 August DPP projects contribute loading Cherry Valley – Garden Prairie: J606, J652, J614, J615.

The cost allocation is as follows:

50			
Queue	MW contribution	Percentage of Cost	\$ cost (\$ 50 M)
AB1-089	7.0	1.65%	0.8264
AB1-090	143.0	33.77%	16.8831
AB1-121 MTX	257.3	60.76%	30.3778
J606	16.2	3.83%	1.9126

As changes to the PJM Interconnection Process occur (such as PJM or MISO projects withdrawing from the queue), other 2016 August DPP projects could receive cost allocation towards this upgrade going forward.

10. To relieve the Cordova - Nelson 345 kV line overloads:

The ComEd SSTE rating with 2019 Baseline upgrades B2692.1 & B2682.2 in-service is 2107 MVA.

This rating is not sufficient.

Upgrade the line conductor along with the station conductor at TSS 940 Cordova EC. The preliminary estimate for this work is \$20.2M with a timeline of 24-30 months. Upon completion the new SSTE rating will be 2385 MVA. PJM Network Upgrade N5316.

The following 2016 August DPP projects (queued after J302) contribute loading Cordova - Nelson: J302, J414, J415, J439, J457, J459, J503, J583, J590, J596, J613.

The cost allocation is as follows:

Queue	MW contribution	Percentage of Cost	20.2
			\$ cost (\$ 20.2 M)
J302	7.1	9.09%	1.8364
J415	26.4	33.80%	6.8282
J439	44.6	57.11%	11.5355

As changes to the PJM Interconnection Process occur (such as PJM or MISO projects withdrawing from the queue), the driver queue project can change and other 2016 August DPP projects could receive cost allocation towards this upgrade going forward.

11. To relieve the E Frankfort – Crete 345 kV line overloads:

The ComEd SSTE is 1483 MVA. The ComEd ALDR is 1925 MVA.

The upgrade will be to reconductor the line at a preliminary estimate of \$10M with a preliminary construction timeline of 24-30 months. The post construction ratings will be 1334/1726/1837/2084 MVA (SN/SLTE/SSTE/SLD). PJM Network Upgrade N5317.

The following 2016 August DPP projects (queued after J415) contribute loading E Frankfort – Crete: J415, J457, J459, J596, J613, J652.

J415 is responsible for this cost.

As changes to the PJM Interconnection Process occur (such as PJM or MISO projects withdrawing from the queue), the driver queue project can change and other 2016 August DPP projects could receive cost allocation towards this upgrade going forward.

12. To relieve the Garden Prairie – Silver Lake 345 kV line overloads:

The ComEd SN is 1201 MVA. The ComEd SSTE is 1568 MVA.

The upgrade is to re-conductor the existing line and upgrade station conductor at both terminals. The preliminary estimate would be \$50M with an estimated construction timeline of 30-36 months. The post construction ratings would be 1334/1726/1837/2084/2396 MVA (SN/SLTE/SSTE/SLD/ALDR). PJM Network Upgrade N5318.

The following 2016 August DPP projects contribute loading Garden Prairie – Silver Lake: J606, J614, J615, J652.

The cost allocation is as follows:

Queue	MW contribution	Percentage of Cost	50
			\$ cost (\$ 50 M)
AB1-090	92.3	17.07%	8.5337
AB1-121 MTX	257.3	47.58%	23.7888
AB2-096	175.0	32.36%	16.1797
J606	16.2	3.00%	1.4978

As changes to the PJM Interconnection Process occur (such as PJM or MISO projects withdrawing from the queue), other 2016 August DPP projects could receive cost allocation towards this upgrade going forward.

13. To relieve the Nelson – Lee County 345 kV line overloads:

The ComEd SSTE is 1568 MVA. The ComEd ALDR is 2033 MVA.

Upgrade needed for 2016 AUG DPP: The upgrade will be to re-conductor the line along with upgrade the station conductor at Nelson and upgrades to 2-345kV Bus Tie Circuit Breakers and disconnect switches at Nelson. A preliminary estimate for this work is \$15M with a construction estimate timeline of 24-30 months. Upon completion the new ratings will be 1560/1802/2083/2477 MVA (SN/SLTE/SSTE/SLD). PJM Network Upgrade N5319.

The following 2016 August DPP projects contribute loading Nelson – Lee County: J456, J575, J577, J587, J476, J512, J541, J555, J569, J593, J594, J597, J599, J611, J614, J615, J637, J638, J414, J415, J439, J459, J583, J590, J598.

The cost allocation is as follows:

Queue	MW contribution	Percentage of Cost	15
			\$ cost (\$ 15 M)
J456	9.27	4.75%	0.7132
J476	16.7	8.57%	1.2848
J541	35.8	18.36%	2.7543
J594	19.5	10.00%	1.5002
J597	16.3	8.36%	1.2540
J415	20.8	10.67%	1.6002
J439	34.1	17.49%	2.6235
J583	15.7	8.05%	1.2079
J598	26.8	13.75%	2.0619

As changes to the PJM Interconnection Process occur (such as PJM or MISO projects withdrawing from the queue), the driver queue project can change and other 2016 August DPP projects could receive cost allocation towards this upgrade going forward.

14. To relieve the Nelson – Walto 345 kV line & the Walto – Electric Junction 345 kV line overloads:

The following 2016 August DPP projects contribute loading Nelson – Walto – Electric Junction: J577, J587, J511, J512, J541, J555, J569, J593, J594, J597, J599, J607, J614, J615, J637, J638, J302, J414, J415, J439, J457, J459, J503, J583, J590, J596, J598, J613, J652.

The SSTE is 1837 MVA and the ALDR is 2199 MVA.

Upgrade 345kV switches at TSS 155 for L15502, upgrade station conductor at the two station terminals and adjust the CT ratios for the line at the station terminals. A preliminary estimate is \$350K with an estimated construction timeline of 20 months. The post construction SSTE will be 2107 MVA. Network Upgrade N4734.

This upgrade is driven and needed for a prior queue.

Per PJM cost allocation rules, the 2016 August DPP projects presently do not receive any cost allocation for this upgrade.

As changes to the PJM Interconnection Process occur (such as PJM or MISO projects withdrawing from the queue), the driver queue project can change and the 2016 August DPP projects could receive cost allocation towards this upgrade going forward.

An additional upgrade is needed for the 2016 August DPP projects: Construct a new 345kV line from Nelson – Electric Junction. A preliminary cost estimate is \$300M with a preliminary construction timeline of 48-60 months. PJM Network Upgrade N5326.

The cost allocation is as follows:

Queue	MW contribution	Percentage of Cost	\$ cost (\$300 M)
J577	5.5	10.19%	30.5556
J541	20.2	37.41%	112.2222
J439	28.3	52.41%	157.2222

As changes to the PJM Interconnection Process occur (such as PJM or MISO projects withdrawing from the queue), the driver queue project can change and other 2016 August DPP projects could receive cost allocation towards this upgrade going forward

15. To relieve the Pontiac - Dresden 345 kV line overloads:

The ComEd SSTE is 1797 MVA.

The upgrade is to re-conductor the line with a preliminary cost estimate of \$22M and an estimated construction timeline of 30 months. Upon completion the new ratings will be 1334/1528/1846/2221 MVA (SN/SLTE/SSTE/SLD). PJM Network Upgrade N5320.

The following 2016 August DPP projects contribute loading Pontiac - Dresden: J474, J641, J644.

Per PJM cost allocation rules, J474 is presently responsible for this upgrade.

As changes to the PJM Interconnection Process occur (such as PJM or MISO projects withdrawing from the queue), the driver queue project can change and other 2016 August DPP projects could receive cost allocation towards this upgrade going forward.

16. To relieve the Quad Cities – ESS H471 345 kV line overload:

ComEd SSTE rating with 2019 Baseline upgrades B2692.1 & B2682.2 in-service will be 2107 MVA.

This rating is no longer sufficient.

Upgrade the line conductor along with the station conductor at Sterling Steel & Quad Cities. The preliminary estimate for this work is \$20.2M with a timeline of 24-30 months. Upon completion the new SSTE rating will be 2385 MVA. PJM Network Upgrade N5321.

The following 2016 August DPP projects (queued after J302) contribute loading to Quad Cities – ESS H471: J302, J414, J415, J439, J457, J459, J503, J583, J590, J596, J598, J613.

The cost allocation is as follows:

Queue	MW contribution	Percentage of Cost	\$ cost (\$ 20.2 M)
J302	7.1	6.53%	1.3194
J415	26.4	24.29%	4.9060
J439	44.6	41.03%	8.2881
J598	30.6	28.15%	5.6865

As changes to the PJM Interconnection Process occur (such as PJM or MISO projects withdrawing from the queue), the driver queue project can change and other 2016 August DPP projects could receive cost allocation towards this upgrade going forward.

17. To relieve the ESS H471 - Nelson 345 kV line overload:

ComEd SSTE rating with 2019 Baseline upgrades B2692.1 & B2682.2 in-service will be 2107 MVA.

This rating is no longer sufficient.

Upgrade the line conductor along with the station conductor. The preliminary estimate for this work is \$20.2M with a timeline of 24-30 months. Upon completion the new SSTE rating will be 2385 MVA. PJM Network Upgrade N5322.

The following 2016 August DPP projects (queued after J414) contribute loading to ESS H471 - Nelson:

J414, J415, J439, J457, J459, J503, J583, J590, J596, J598, J613.

The cost allocation is as follows:

Queue	MW contribution	Percentage of Cost	\$ cost (\$ 20.2 M)
J414	19.2	15.89%	3.2106
J415	26.4	21.85%	4.4146
J439	44.6	36.92%	7.4579
J598	30.6	25.33%	5.1169

As changes to the PJM Interconnection Process occur (such as PJM or MISO projects withdrawing from the queue), the driver queue project can change and other 2016 August DPP projects could receive cost allocation towards this upgrade going forward.

18. To relieve the Crete – St John 345 kV line overloads:

The following 2016 August DPP projects contribute loading to Crete – St John: J511, J592, J606, J607, J614, J615, J637, J638, J302, J414, J415, J457, J459, J503, J596, J613, J652.

ComEd:

The ComED ALDR rating is 1925 MVA.

ComEd upgrade: Reconductor line to achieve ratings of 1837 SSTE, SLD of 2360 MVA (ALDR of 2714 MVA). Preliminary estimate for the upgrade is \$18M with an estimated construction timeline of 24-30 months. PJM Network Upgrade N5253.

Per PJM cost allocation rules, the 2016 August DPP projects presently do not receive any cost allocation for this upgrade as none of them meet the PJM cost allocation thresholds.

As changes to the PJM Interconnection Process occur (such as PJM or MISO projects withdrawing from the queue), the driver queue project can change and the 2016 August DPP projects could receive cost allocation towards this upgrade going forward

MISO:

The MISO SE rating is 1508 MVA.

MISO end upgrade is to upgrade St John substation conductor and switches. \$1M cost estimate. New MISO end SE rating will be 1900 MVA.

This upgrade is driven and needed for a prior queue.

Per PJM cost allocation rules, the 2016 August DPP projects presently do not receive any cost allocation for this upgrade.

As changes to the PJM Interconnection Process occur (such as PJM or MISO projects withdrawing from the queue), the driver queue project can change and the 2016 August DPP projects could receive cost allocation towards this upgrade going forward.

Additional MISO-end upgrades: Upgrade to 4000 A switch(es) and to bundled 1590 AL substation conductor. \$3M. New MISO-end ratings to be 1961/2390 MVA SN/SE.

This upgrade is driven and needed for a prior queue.

Per PJM cost allocation rules, the 2016 August DPP projects presently do not receive any cost allocation for this upgrade.

As changes to the PJM Interconnection Process occur (such as PJM or MISO projects withdrawing from the queue), the driver queue project can change and the 2016 August DPP projects could receive cost allocation towards this upgrade going forward.

19. To relieve the Lee County – Byron 345 kV line overloads:

The ComEd SN rating is 1334 MVA; the SSTE is 1837 MVA; the ALDR is 2397 MVA.

Upgrade: re-conductor a portion of L0626. A preliminary estimate for this work is \$6M with an estimated construction timeline of 30-36 months. Upon completion the new line ratings will be 1679/2058/2107/2280 MVA (SN/SLTE/SSTE/SLD). PJM Network Upgrade N5254.

The following 2016 August DPP projects contribute loading to Lee County - Byron: J456, J575, J577, J587, J476, J512, J541, J555, J569, J593, J594, J597, J599, J611, J614, J615, J637, J638, J414, J415, J439, J459, J583, J590, J598.

The cost allocation is as follows:

Queue	MW contribution	Percentage of Cost	\$ cost (\$ 6 M)
J534	16.0	10.47%	0.6283
J541	35.8	23.43%	1.4058
J594	19.5	12.76%	0.7657
J415	20.6	13.48%	0.8089
J439	34.1	22.32%	1.3390
J598	26.8	17.54%	1.0524

As changes to the PJM Interconnection Process occur (such as PJM or MISO projects withdrawing from the queue), other 2016 August DPP projects could receive cost allocation towards this upgrade going forward.

Additional upgrade will be line re-conductoring, station re-conductoring and replacement of 345kV bus disconnect switches at Byron Station. A preliminary cost estimate will be \$6.5M with an estimated construction timeline of 24-30 months. Upon completion the new ratings will be 1961/2112/2524/3015 MVA (SN/SLTE/SSTE/SLD). PJM NUN N5323.

The cost allocation is as follows:

Queue	MW contribution	Percentage of Cost	\$ cost (\$ 6.5 M)
J541	35.8	26.17%	1.7010
J594	19.5	14.25%	0.9265
J415	20.6	15.06%	0.9788
J439	34.1	24.93%	1.6202
J598	26.8	19.59%	1.2734

As changes to the PJM Interconnection Process occur (such as PJM or MISO projects withdrawing from the queue), other 2016 August DPP projects could receive cost allocation towards this upgrade going forward.

20. To relieve the Pleasant Prairie – Zion Station 'R' 345 kV line overload:

The ComEd ALDR rating is 2124 MVA. No ComEd upgrade needed.

The MISO end SE rating is 1528 MVA. The planned fix is to use MTEP project 8065 which builds a new 345 kV sub by looping in the Zion - Libertyville Blue 345kV line and the Pleasant Prairie - Arcadian 345kV line. The Projected IS date for MTEP 8065 is 12-31-2020.

The following 2016 August DPP projects contribute loading to Pleasant Prairie – Zion Station 'R': J592, J606, J652.

Any project contributing to this overload will need a PJM interim study performed if coming into service prior to 12-31-2020 (MTEP 8065).

21. To relieve the AB1-089 Tap – Wayne 345 kV line overloads:

The ComEd SN is 1679 MVA and the SSTE rating is 2107 MVA.

AB1-089 and AB1-090 stability upgrade: new 345 kV line from AB1-089 to Wayne. The new 345kV line would have the same ratings as L0626. The ratings are 1679/2058/2107/2280/2622 MVA (SN/SLTE/SSTE/SLD/ALDR) respectively. A preliminary cost estimate is \$127M with a preliminary construction timeline of 30-36 months. PJM Network Upgrades N5178.1, N5178.2, N5178.3, N5178.4, N5179, N5179.1.

The following 2016 August DPP projects contribute loading to AB1-089 Tap – Wayne: J606, J614, J615, J414, J415, J652.

The cost allocation is as follows:

127			
Queue	MW contribution	Percentage of Cost	\$ cost (\$127 M)
AB1-089	225.2	26.05%	33.0870
AB1-090	225.2	26.05%	33.0870
AB1-121 MTX	304.2	35.19%	44.6939
AB2-096	92.9	10.75%	13.6491
J606	16.9	1.96%	2.4830

As changes to the PJM Interconnection Process occur (such as PJM or MISO projects withdrawing from the queue), other 2016 August DPP projects could receive cost allocation towards this upgrade going forward.

22. To relieve the AB1-122 Tap – Kendall 345 kV line overloads:

The ComEd SSTE is 1215 MVA and the ALDR is 1477 MVA.

2020 baseline upgrade B2732.1 (loop Tazewell – Kendall into Dresden) resolves the overloads on this line. The Projected IS date for B2732.1 is 6-1-2020.

The following 2016 August DPP projects contribute loading to AB1-122 Tap – Kendall: J456, J641, J644.

Any project contributing to this overload will need a PJM interim study performed if coming into service prior to 6-1-2020 (B2732.1).

23. To relieve the AB1-122 Tap – Dresden 345 kV line overloads:

The ComEd SSTE is 1568 MVA and the ALDR is 2033 MVA.

The upgrade is to re-conductor the line at an estimated cost of \$20 million. The time required to install this reinforcement is 2 – 3 years. Post construction line ratings will be 1334/1726/1837/2084 MVA (SN/SLTE/SSTE/SLD). PJM Network Upgrade N5324.

The following 2016 August DPP projects contribute loading to AB1-122 Tap – Dresden: J456, J641, J644.

Per PJM cost allocation rules, the 2016 August DPP projects presently do not receive any cost allocation for this upgrade as they do not meet the cost allocation thresholds.

As changes to the PJM Interconnection Process occur (such as PJM or MISO projects withdrawing from the queue), the driver queue project can change and the 2016 August DPP projects could receive cost allocation towards this upgrade going forward.

24. To relieve the Newton – Casey 345 kV line overloads:

The ratings are 1200/1319 MVA SN/SE.

Reconductor 26.5 miles of 556.5 Dove ACSS TW HS conductor and upgrade terminal equipment at Newton and Casey. Expected ratings to be SN/SE 1343/1527 MVA. Estimated Cost: \$11.819 M.

The following 2016 August DPP projects contribute loading to Newton – Casey: J573.

J573 is responsible for this cost.

25. To relieve the Cook – T-094 345 kV line overload:

Reinforcement:

Rebuild or Reconductor approximately 30 miles of the Cook – T-094 (Segreto) 345 kV line. PJM Network Upgrade: **N5311**.

Cost Estimate: \$60,000,000.

Time: 24 to 36 months

The driver for this overload is MISO DPP August 2016 project **J587**.

The following 2016 August DPP projects contribute loading to the overload: J456, J575, J577, **J587**, J446, J474, J476, J511, **J512**, J513, **J541**, J555, J569, J592, **J593**, **J594**, J595, **J597**, J599, J606, J607, J611, J614, J615, J302, J414, J415, **J439**, J457, J503, J583, J590, **J596**, **J598**, and J613. These queue contributors are listed in queue order based on each project's M2 Date. This queue order was proposed and approved by MISO.

			60
Queue	MW contribution	% of Cost	Cost (\$60 M)
J587	11.3733	7.02	4.209
J512	14.8625	9.17	5.501
J541	23.184	14.30	8.581
J593	14.8825	9.18	5.508
J594	17.895	11.04	6.623
J597	17.913	11.05	6.630
J439	29.525	18.21	10.927
J596	15.0925	9.31	5.586
J598	17.388	10.73	6.435

As changes to the PJM Interconnection Process occur (such as PJM or MISO projects withdrawing from the queue), the driver for this upgrade could change.

26. To relieve the Twin Branch - Argenta 345 kV line overload:

Reinforcement:

Existing PJM Network Upgrade: **N5240**. A sag check will be required for the ACSR ~ 954 ~ 45/7 ~ RAIL - Conductor Section 1 to determine if the line section can be operated above its emergency rating of 1409 MVA.

Cost Estimate: \$208,000

Per PJM cost allocation rules, the 2016 August DPP projects presently do not receive any cost allocation for this upgrade.

As changes to the PJM Interconnection Process occur (such as PJM or MISO projects withdrawing from the queue), the 2016 August DPP projects could receive cost allocation towards this upgrade going forward.

Additional Reinforcement on AEP end:

Replace Twin Branch Wavetrap. PJM Network Upgrade: **N5310.1**.

Cost Estimate: Estimated Cost: \$400,000.

Time: 6 to 12 months

Additional Reinforcement on MISO end:

Replace substation structure at Argenta substation, to accommodate larger wire: **N5310.2**.

Cost Estimate: Estimated Cost: \$500,000.

Time: 12 months

The driver for the additional reinforcements is MISO 2016 August DPP project **J414**.

The following 2016 August DPP projects contribute loading to the overload: J456, J575, J577, J587, J446, J474, J476, J511, **J512**, J513, **J541**, J555, J569, J592, **J593**, **J594**, J595, **J597**, J599, J606, J607, J611, J614, J615, J302, **J414**, J415, **J439**, J457, J503, J583, J590, **J596**, **J598**, and J613. These queue contributors are listed in queue order based on each project's M2 Date. This queue order was proposed and approved by MISO.

			\$900,000
Queue	MW contribution	% of Cost	Cost (\$0.9 M)
J512	14.86	9.31	83,815
J541	23.14	14.50	130,540
J593	14.88	9.33	83,928
J594	17.90	11.21	100,934
J597	17.91	11.23	101,035
J414	8.91	5.58	50,243
J439	29.51	18.49	166,418
J596	15.10	9.46	85,183
J598	17.36	10.88	97,905

Since the cost of the upgrade is less than \$5 Million, based on PJM's cost allocation criteria, the entire MISO 2016 August DPP queue is eligible for cost allocation.

As changes to the PJM Interconnection Process occur (such as PJM or MISO projects withdrawing from the queue), the driver for this upgrade could change.

27. To relieve the Benton – T-094 345 kV line overload:

Reinforcement:

Reconductor or rebuild depending on the existing structures the portions of 345 kV lines between the Benton Harbor and Segreto 345 kV substations. PJM Network Upgrade: **N5106**.

Cost Estimate: \$19,000,000

Time: 24 to 36 Months

The following MISO 2016 DPP August Projects contribute to this overload: J456, J575, J577, J587, J446, J474, J476, J511, J512, J513, J541, J555, J569, J592, J593, J594, J595, J597, J599, J606, J607, J611, J614, J615, J302, J414, J415, J439, J457, J503, J583, J590, J596, J598, and J613. These queue contributors are listed in queue order based on each project's M2 Date. This queue order was proposed and approved by MISO.

			19
Queue	MW contribution	% of Cost	Cost (\$19 M)
J411	10.8334	3.11	0.591
J515	16.672	4.78	0.909
AB1-121	52.506	15.06	2.862
J498	16.3798	4.70	0.893
J499	16.1677	4.64	0.881
J500	23.516	6.75	1.282
J501	24.532	7.04	1.337
J526	14.8392	4.26	0.809
J476	14.4008	4.13	0.785
J512	15.65	4.49	0.853
J541	24.4	7.00	1.330
J593	15.67	4.50	0.854
J594	18.843	5.41	1.027
J597	18.861	5.41	1.028
J439	31.085	8.92	1.694
J596	15.8925	4.56	0.866
J598	18.3	5.25	0.998

As changes to the PJM Interconnection Process occur (such as PJM or MISO projects withdrawing from the queue), the driver for this upgrade could change.

28. To relieve the Loretto - Wilton 345 kV line overload:

Reinforcement:

Existing 2019 baseline upgrade **b2728**. Mitigate sag limitations on Loretto - Wilton Center 345 kV Line and replace station conductor at Wilton Center

Cost Estimate: Based on the upgrade and PJM's cost allocation criteria, MISO DPP August 2016 projects are not responsible for any cost of this upgrade.

Time: 2019 Baseline