



PJM May 2014 Queue Generation Affected System Impact Study

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1 Executive Summary

This report documents the system impacts of Nine (9) projects in the PJM generator interconnection queue on the Midcontinent Independent System Operator (“MISO”) transmission system. The projects are listed in Table 1-1.

Table 1-1 List of PJM Group Generation Interconnection Projects

PJM Queue	PJM Point of Interconnection	Transmission	Size(MW)	Fuel Type	State
X1-087	Stillman Valley	ComEd	19	methane	IL
X3-023	S. Greenwich-Willard 69kV	AEP	60	wind	OH
Y2-050	Tidd-Canton Central	AEP	742	natural gas,CC	OH
Y2-053	Lemoyne 138kV	ATSI	35	Gas	OH
Y3-088	Kendall I	ComEd	20	natural gas,CC	IL
Y3-089	Kendall II	ComEd	20	natural gas,CC	IL
Y3-090	Kendall III	ComEd	20	natural gas,CC	IL
Y3-091	Kendall IV	ComEd	20	natural gas,CC	IL
Y3-103	Valley-Raccoon 138kV	DL	205	natural gas,CC	PA
		Total	1141		

Steady State AC analysis was performed to identify any reliability criteria violations caused by the study generators. The study did not identify any constraints in both the near term (2016) and the out year (2023) scenarios. The study projects have full injection capability conditional to the transmission and generation assumptions in this study.



2 Study Methodology & Assumptions

2.1 Study Criteria

All interconnection requirements are based on the applicable MISO Interconnection Planning Criteria and in accordance with the NERC Reliability Standards. Steady state violations of applicable planning criteria were attributed to the PJM group generation requests by the usage of MISO injection criteria, and applicable local planning criteria, especially, Northern Indiana Power Service Co. (NIPSCO) generation interconnection criteria. NIPSCO's Generation Interconnection criteria can be found under section 4.5 of the planning methodology document available at:

<https://www.misoenergy.org/Library/Repository/Study/TO%20Planning%20Criteria/NIPSCO%20TO%20Planning%20Criteria.pdf>

2.2 Contingency Criteria

A comprehensive list of contingencies was considered for steady-state AC contingency analysis:

- NERC Category A with system intact
- NERC Category B contingencies
 - Single element outages, at buses with a nominal voltage of 69 kV and above, in the following areas: NIPS (area 217), DEI (area 208), IPL (area 216), MEC (area 635), CWLD (area 333), AMMO (area 356), AMIL (area 357), CWLP (area 360), CE (area 222), AEP (area 205).
 - Multiple-element outages initiated by a fault with normal clearing such as multi-terminal lines, in AEP, CE, Ameren, MEC, CWLP, DEI, IPL, NIPS.
- NERC Category C contingencies
 - Selected NERC Category C events.

2.3 Monitored Elements

Table 2-1 Monitored Area outlines the list of areas monitored for this study. All facilities in the study region with a voltage of 69kV and above were monitored.

Table 2-1 Monitored Area

Area #	Area ID	Area Name
207	HE	Hoosier Energy
208	DEI	Duke Energy Indiana
210	SIGE	Southern Indiana Gas & Electric Company
216	IPL	Indianapolis Power & Light Company
217	NIPS	Northern Indiana Public Service Company
333	CWLD	Columbia, MO Water and Light
356	AMMO	Ameren Missouri
357	AMIL	Ameren Illinois



Area #	Area ID	Area Name
360	CWLP	City of Springfield (IL) Water Light & Power
361	SIPC	Southern Illinois Power Cooperative
295	WEC	Wisconsin Electric Power Company (ATC)
600	XEL	Xcel Energy North
608	MP	Minnesota Power & Light
613	SMMPA	Southern Minnesota Municipal Power Association
615	GRE	Great River Energy
620	OTP	Otter Tail Power Company
627	ALTW	Alliant Energy West
633	MPW	Muscatine Power & Water
635	MEC	MidAmerican Energy
661	MDU	Montana-Dakota Utilities Co.
680	DPC	Dairyland Power Cooperative
694	ALTE	Alliant Energy East (ATC)
696	WPC	Wisconsin Public Service Corporation (ATC)
697	MGE	Madison Gas and Electric Company (ATC)
698	UPPC	Upper Peninsula Power Company (ATC)

2.4 Model Development

The following base cases were used for the study:

- StudyCase-DPP-Aug13_2016SPK_v32_MUST_131031.sav
- StudyCase-DPP-Aug13_2016SH_v32_MUST_131031.sav
- StudyCase-DPP-Aug13_2023SH_v32_MUST_131031.sav
- StudyCase-DPP-Aug13_2023SPK_v32_MUST_131101.sav

The study cases were built by adding and dispatching the appropriate queue projects to the base cases. The detail of each PJM interconnection request is listed in Table 1-1. The study projects were dispatched per MISO criteria to the entire PJM footprint, where generators were scaled in proportion to the available reserve.

2.5 Study Assumptions

This affected system impact study was conducted with all the PJM MAY 2014 participating generators operating together as a group. Analysis was not performed on individual generating units or subsets of the generating units unless specifically noted otherwise. Higher queued PJM projects were modeled as outlined in Appendix A of the report. The results obtained in this analysis may change if any of the data or assumptions which were made during the development of the study models is revised.



3 Steady State Analysis

3.1 Near Term (2016) Analysis

The analysis did not identify any criteria violations.

3.2 Out Year (2023) Analysis

The analysis did not identify any criteria violations.

4 Conclusion

The Affected system study did not identify any steady state thermal violations with the interconnection of the Nine PJM projects on the monitored MISO transmission system. Both Near-Term(2016) and Out-year (2023) analysis were performed as part of the study. These study projects have full injection capability conditional to the transmission and generation assumptions in this study.



Appendix A PJM Higher Queued Projects

A.1 PJM November 2013 Cycle

PJM Queue	PJM POI	State	MISO SH Output	MISO SPK Output	Fuel
V1-024	LaSalle 1	IL	20.0	20.0	nuclear
V1-025	LaSalle 2	IL	20.0	20.0	nuclear
V4-046	Byron 1	IL	20.0	20.0	nuclear
V4-047	Byron 2	IL	20.0	20.0	nuclear
V4-048	Braidwood 1	IL	20.0	20.0	nuclear
V4-049	Braidwood 2	IL	20.0	20.0	nuclear
W2-048	Pontiac MidPoint – Lanesville 345kV	IL	62.5	12.5	wind
W3-046	Powerton 345kV – Katydid 345kV	IL	208.0	51.6	wind
W4-005	Pontiac Midpoint – Latham 345kV	IL	351.0	70.2	wind
X1-096	Loretto-Kings Creek 138kV	MD	150.0	30	wind
X2-022	Pontiac Midpoint-Lanesville II	IL	189.0	37.8	wind
X2-031	Krayn 115kV	PA	50.0	10	wind
X2-052	Dumont-Olive 345kV	IN	0	675.0	natural gas
X3-051	Flatlick 765kV	OH	0	610.0	natural gas
X4-020	Peach Bottom-TMI #1 500kV I	PA	0	800.0	natural gas
X4-021	Peach Bottom-TMI #2 500kV II	PA	0	320.0	natural gas
X4-025	Millbrook Park 138kV	KY	80.0	80.0	coal
Y1-030	Forest 69kV	OH	100.0	20	wind
Y1-065	Rock Spring 500kV	MD	0	852.0	natural gas



A.2 PJM May 2013 Cycle

PJM Queue	PJM POI	State	MISO SH Output	MISO SPK Output	Fuel
T130	Convoy – East Lima 345kV	OH	300	60	wind
T131	Lincoln – Sterling 138kV	OH	150	30	wind
T142	Southwest Lima – Marysville 345kV	OH	300	60	wind
T143	Hennepin 138kV	IL	250	50	wind
T148	Caledonia Wind II 100 MW	IL	100	20	wind
T94	Cook – Palesades 345kV	MI	0	1035	natural gas
T99	Caledonia Wind 100 MW	IL	100	20	wind
U2-028A_AT1	Ironville 138kV	OH	135	135	other
U2-072	East Lima – Marysville 345kV	OH	300	60	wind
U3-021	Silver Lake – Cherry Valley 345kV	IL	0	100	natural gas
U4-027	Normandy-Kewanee 138kV	IL	0	100	natural gas
V1-011	Haviland 138kV	OH	100	20	wind
V1-012	Haviland 138kV	OH	150	30	wind
V2-006	East Leipsic 138kV	OH	150	30	wind
V3-007	Desoto-Tanners Creek #1 345kV	IN	200	40	wind
V3-008	Desoto-Tanners Creek #1 345kV	IN	200	40	wind
V3-009	Desoto-Tanners Creek #1 345kV	IN	200	40	wind
V4-010	Tiffin Center 138kV	OH	200	40	wind
V4-015	Fostoria Central 138kV	OH	66.6	13.32	wind
V4-016	Valley 138kV	MI	200	40	wind
W1-072A_AT5	Lemoyne 345kV	OH	0	40	natural gas
W2-001	Fostoria Central 138kV	OH	66.6	13.32	wind
W3-059A_At6	Avery – Greenfield 138kV	OH	99	19.8	wind
W3-088	South West Lima 345kV	OH	200	40	wind
W3-128	Sporn – Waterford 345kV	OH	0	652	natural gas
W3-170	Buckskin 69kV	OH	0	12	solar
X1-027A_AT12	Davis Besse – Beaver 345kV	OH	500	100	wind
Y1-006	Jubal Early – Austinville 138kV	VA	72	14.4	wind
Y1-069	Bay Shore – Fostoria Central 345kV	OH	0	799	natural gas



A.3 PJM November 2012 Cycle

PJM Queue #	ProjectName	State	MISO SH Output	MISO SPK Output	Fuel Type
Q39	Kewanee 138kV	IL	105	21	wind
Q49	Dresden 345kV	IL	45	45	nuclear
Q50	Dresden 345kV	IL	58	58	nuclear
Q51	Quad City 345kV	IL	30	30	nuclear
Q57	Steward-Waterman 138kV	IL	22	4.4	wind
R16	Lena 138kV	IL	126	25.2	wind
R30	Pontiac Mid-Point 345kV	IL	500	100	wind
R33	Nelson 345kV	IL	0	600	natural gas
S27	Blue Mound I	IL	198	39.6	wind
S28	Blue Mound II	IL	198	39.6	wind
S36	Kankakee 138kV	IL	175	35	wind
S37	Kankakee 138kV	IL	175	35	wind
S55	Zion 345kV	IL	0	510	natural gas
S57	Hvdc	IL	3500	1192	HVDC
U1-054	Calumet	IL	0	54	natural gas
U3-031	Lincoln Generating Facility	IL	0	40	natural gas
U4-033	University Park North	IL	0	36	natural gas
05MLCS	Meadow Lake	IL	600	120	wind
Q01, Q03	Fowler Ridge	IN	750	150	wind