Impacts of MISO August 2012 West Area DPP generators on PJM Facilities

1. MISO generators studied:

MISO Project	Point of Interconnection	Max Summer Output	Fuel Type
G735	Lime Creek Substation	200	Wind
G798	ITC Midwest Fernald 115kV Substation	150	Wind
G826	Xcel Lakefield Generation SW - Lakefield Junction 345kV	200	Wind
G830	GRE McHenry substation	99	Wind
G870	Hayward - Winnebago 161 kV	201	Wind
G947	ITCM Whispering Wilows 161kV Substation	99	Wind
H008	ITC Midwest Richfield 69 kV Substation	36	Wind
H009	ITC Midwest Traer - Marshalltown 161 kV	150	Wind
H021	Wellsburg 115kV Substation	138.6	Wind
H081	Brookings County - Lyon County 345kV	201	Wind
H096	Grand Junction - Perry 161 kV	50	Wind
J026	Adams 161 kV Substation	50	Wind
J091	ITCM Lime Creek 161 kV Substation	66	Wind
J097	ITC Midwest Denmark - Newport 161kV	200	Wind
J112	DPC Utica - Lewiston 69 kV	4.95	Wind
J183(net zero)	Split Rock Substation	200	Wind
J191	Rolling Hills 345 kV Substation	101.2	Wind
J196	Vermillion 138 kV Substation	50	Wind
J200	RM Heskett Station 115 kV & 41.6 kV	75	Gas
J232	Baldwin Station	35	Coal
J238	Eagle Valley 138kV Substation	725	Gas
R42	Lehigh 345 kV Substation	250	Wind
R49	Pomeroy Generating station	12	Wind
R65	R34 Expansion	92	Wind

Table 1 – Studied MISO Projects

2. Summer Peak analysis

a. Model used – PJM 2015SP with the above MISO generators added
b. Contingencies used – All PJM category B and C contingencies
c. Monitored areas – All PJM areas
d. Analysis type – Generation Deliverability
    i. All generators were scaled to their respective capacity portions for base case and category B events
    ii. All generators were scaled to their respective total capabilities for category C events
e. Results – **No summer peak impact**

3. Light Load analysis

a. Model used – PJM 2014LL with the above MISO generators added
b. Contingencies used – All PJM category B and C contingencies
c. Monitored areas – All PJM areas
d. Analysis type – Generation Deliverability
    i. All wind generators were scaled to 80% of their respective total capabilities for base case, category B, and category C events
    ii. The coal generator was scaled to 45% of its respective total capabilities for base case, category B, and category C events
    iii. Gas generators were not studied for light load conditions

e. Results – **One element was found to be overloaded** :

ComEd Line #	Element	Areas	Rating	MISO, MW	Cont Label	Cont Type	Pre, MW	Pre %	Post, MW	Post%
L0621	BYRON; B - CHERR; B ckt1 345kV	222	1441	81.69	BYRON; B_BYRON; R_016	single	1379.4	95.73	1461.12	101.4

Table 3 – Light Load Results

CONTINGENCY 'BYRON; B_BYRON; R_016' / Byron B – Byron R.*
DISCONNECT BRANCH FROM BUS 270678 TO BUS 270679 CKT 1
END

f. Projects contributing to the overload above:

Name	Impact, MW
G735	9.43
G798	9.03
R42	12.82
G870	8.49
G947	5.49
R49	0.58
H008	2.10
H009	9.89
H021	8.35
H096	2.65
R65	4.64
J091	3.11
J191	5.11

Table 4 – MW contribution breakdown for the Byron – Cherry Valley 345kV overload

H021 will be fully responsible for the required upgrade as it is the project that drives the overload, other projects don't meet PJM cost allocation rules.

g. Proposed upgrades:

ComEd Line #	**Upgrade Description**	**Planning-Level Cost Estimate**
L0621	Mitigate sag limitation on 21.5 miles of 2156 ACSR OVHD conductor & upgrade BT 4-13 CT's at Stn 6 Byron	$20.0 M

Table 5 – Proposed Upgrades

h. MVP Option:

MISO MVP project Galesburg – Fargo – Maple Ridge 345kV was tested and proved to mitigate the Byron – Cherry Valley overload.

4. Summary

Only one thermal constraint was identified for MISO DPP-2012-August group. H021 is the only project with cost responsibility towards the upgrade. The H021 customer may choose to build the upgrade or proceed with MISO MVP option, in which case operating procedures must be established in order to mitigate the system constraint identified above prior to the construction of the required MISO MVP projects.

Proposed generation projects, which intend to proceed, will be required to enter into a Facilities Study Agreement with PJM in order to commence the Facilities Study for the required reinforcements.