



Joint and Common Market

January 24<sup>th</sup>, 2014

**CAPACITY DELIVERABILITY  
FACT FINDING #1  
UPDATE**



# Summary of Activities



- Intra-RTO Deliverability
  - Study complete
- Inter-RTO Deliverability
  - Study complete
- Incremental Deliverability
  - Discussing the study methodology and next steps

# Intra-RTO Deliverability – General Assumptions

## Assumptions

- Base Model:
  - PJM and MISO used their latest 2018 Summer representations
  - World model – 2018 Summer model from the 2012 MMWG series of cases
- Model Topology:
  - Include all MISO Board and PJM Board approved transmission enhancement projects expected in-service by 2018 Summer
- Generation:
  - Planned deactivations (MISO disregarded planned retirements)
  - Anticipated generation additions



# Intra-RTO Deliverability – Two Major Studies

## MISO to MISO Generation Deliverability Test

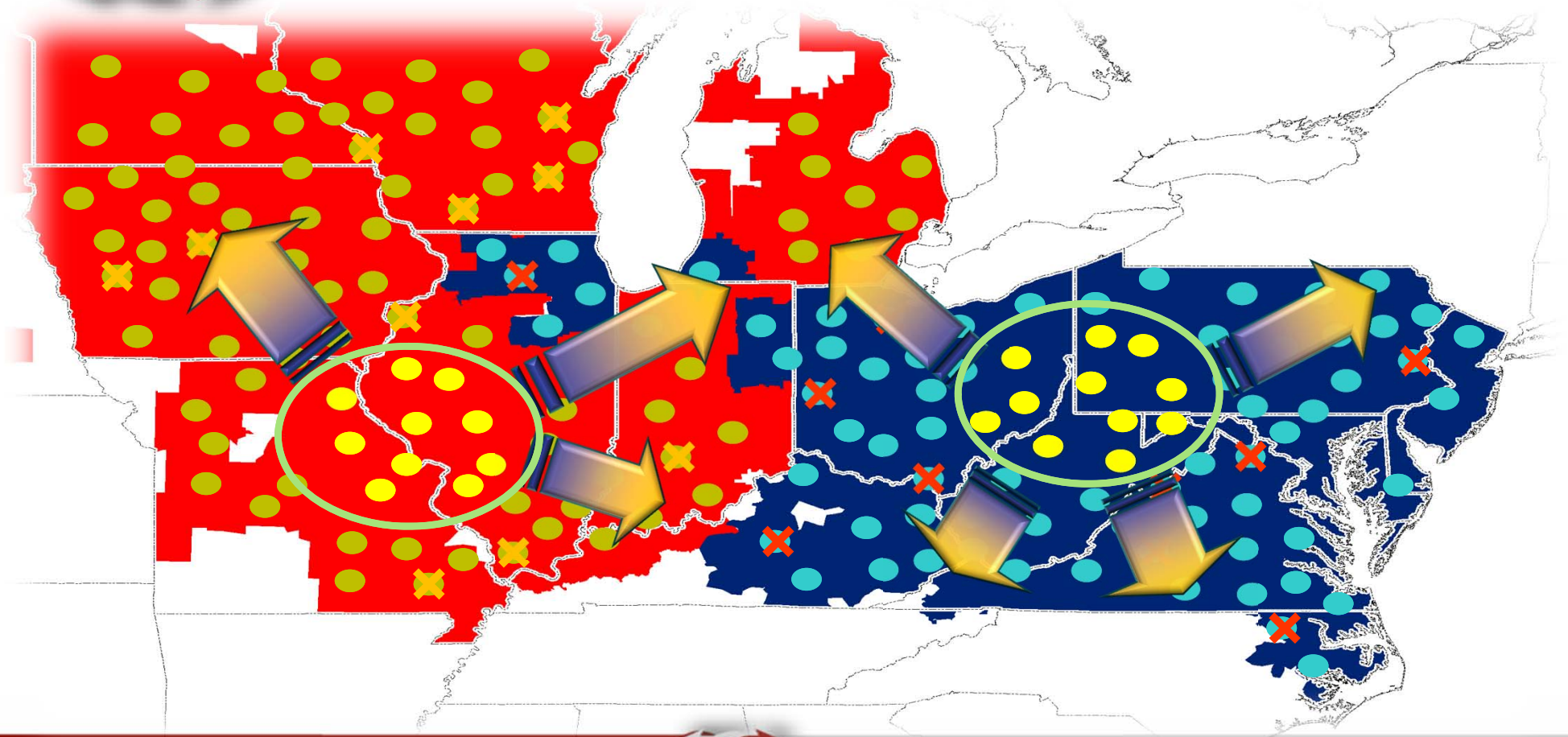
- Miso’s current study methodology
- Generation ramped:
  - MISO Generation only
- Monitored Facilities:
  - MISO and MISO first tier neighbors
- Contingencies:
  - NERC Category A
  - NERC Category B

## PJM to PJM Generation Deliverability Test

- Pjm’s current study methodology
- Generation Ramped:
  - PJM Generation Only
- Monitored Facilities:
  - PJM and neighboring MISO zones
- Contingencies:
  - NERC category A
  - NERC category B “Single”
    - Over 8,000 contingences
  - NERC category C “Multiple”
    - Includes bus, double circuit towerline and faulted breaker
    - Over 8,500 contingencies



# Intra-RTO Deliverability Testing



# Intra-RTO Deliverability Results

## PJM Results

Analysis Description	Generation (MW)	Approximate Energy Resources (MW)	Tested Capacity Resource Level (MW)	Calculated Undeliverable Capacity Resources (MW)	Calculated Deliverable Capacity Resources (MW)	% Deliverable Capacity Resources
PJM Capacity Deliverability FF#1 - Step 1	231,569	21,107	210,462	334	210,128	99.84%

## MISO Results

Analysis Description	Generation (MW)	Approximate ER (MW)	Tested NR Level (MW)	Calculated Undeliverable Capacity Resources (MW)	Calculated Deliverable Capacity Resources (MW)	Deliverable Capacity Resources (% of Tested NR)	Deliverable Capacity Resources (% of total gen)
MISO Capacity Deliverability FF#1 - Step 1	190,405	22,940	167,465	7,709	159,756	95.40%	83.9%



# Intra-RTO Deliverability – PJM Results

PJM facilities limiting deliverability under the PJM to PJM generation deliverability test:

Flowgate Number	From Bus #	From Bus Name	To Bus #	To Bus Name	Circuit ID	From/To Voltage	From/To Area
1	235436	01ROCHE	235329	01EUREKA	1F	138/138	201/201
2	239070	02RICHLD	238521	02NAOMI	1	138/138	202/202
3	239176	02WOOD+	238890	02LEMOYN	1	138/138	202/202
4	271333	DIXON ; R	272517	STILLMAN ;RT	1	138/138	222/222
5	271835	KEWANEE ;23	271655	HENNEPIN ; T	1	138/138	222/222
6	272378	ROSCOE BE;BT	271638	HARLEM ; B	1	138/138	222/222
7	239316	02WASHREC	238864	02KNOX	1	138/138	202/202
8	242605	05CLNCHR	242606	05CLNLFD	1	138/138	205/205

Flowgates 1-6 are caused by the RTEP and MTEP case merge

Flowgates 7-8 are caused by interim capacity right for some retired units

# Intra-RTO Deliverability – PJM Results

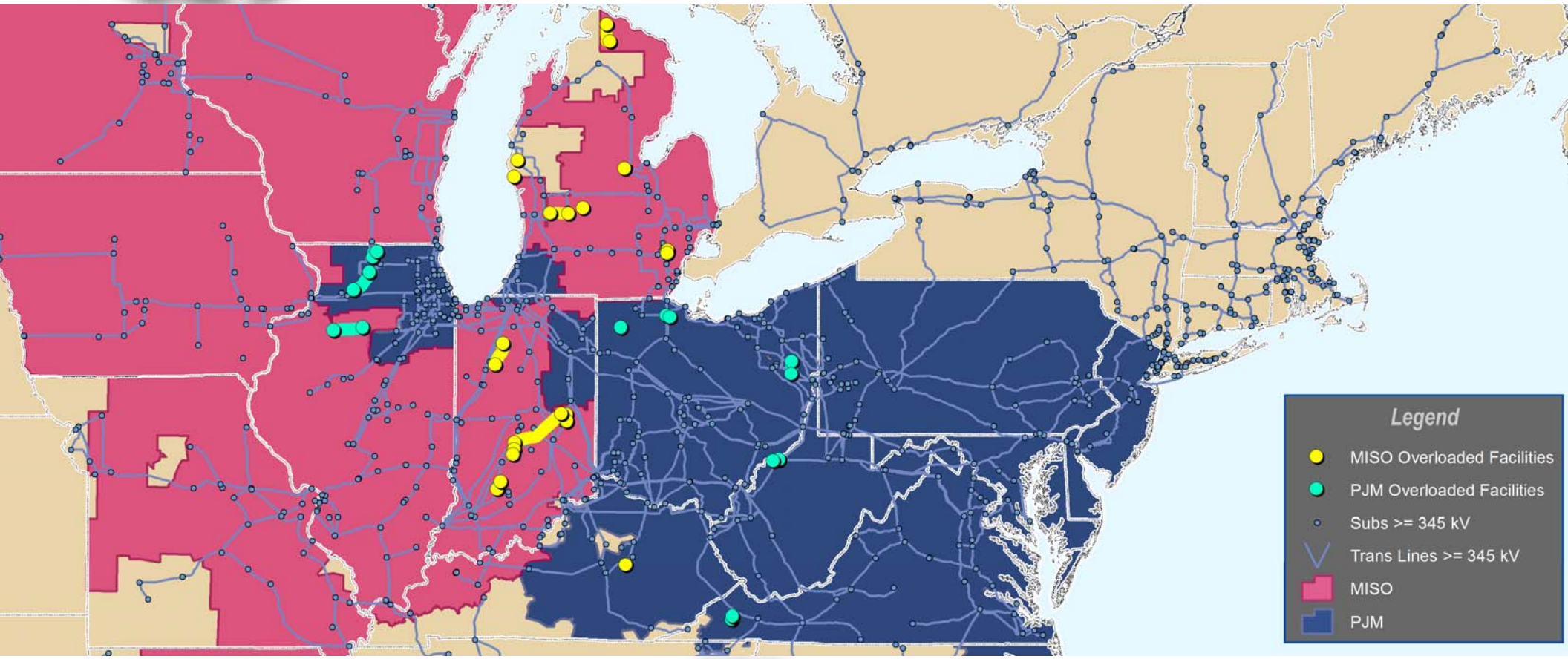
MISO facilities that restrict deliverability under the PJM to PJM generation deliverability test:

Flowgate Number	From Bus #	From Bus Name	To Bus #	To Bus Name	Circuit ID	From/To Voltage	From/To Area
1	249752	08HEBVST	249756	08HEOWEN	1	138/138	208/208
2	249796	08MAPLE	249704	08CHRYS2	1	138/138	208/208
3	255158	17MONTICELLO	255127	17E_WINAMAC	1	138/138	217/217
4	348921	4PRINCETN TP	348919	4LTV STL NTP	1	138/138	357/357
5	271655	HENNEPIN ; T	348918	4HENNEPIN S	1	138/138	222/357
6	249752	08HEBVST	249756	08HEOWEN	1	138/138	208/208
7	254608	16HRTCSTAP	254626	16MOORSV	24	138/138	216/216
8	254641	16PRITCH	254576	16CNTRTN	21	138/138	216/216
9	256087	18BULLOCKB	256212	18BULLOCKW	Z1	138/138	218/218
10	256257	18DONLDS	263657	18REDWOOD	1	138/138	218/218
11	256524	18HWHNJ	256566	18FOURMILEW	1	138/138	218/218
12	256322	18LOWELJ	256209	18MARQTT	1	138/138	218/218
13	256263	18RONDO	256259	18RIGGSV	1	138/138	218/218

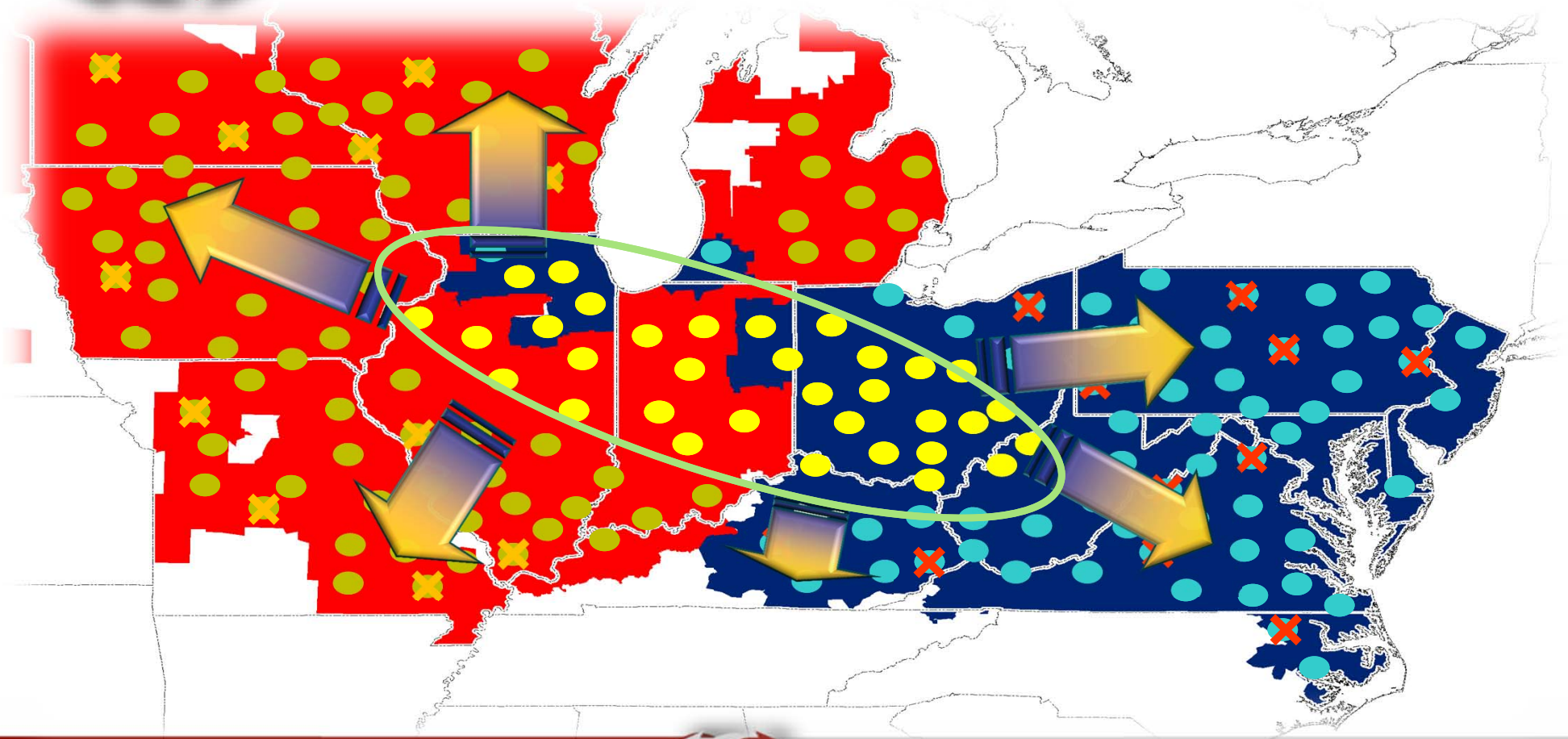
Only flowgates 2 & 4 are impacted by ramping PJM generation.



# Intra-RTO Deliverability – PJM Results



# Inter-RTO Deliverability Testing



# Inter-RTO Deliverability – PJM results

## Deliverability Result for the PJM Transmission Facilities

- 9 Total Facilities in the PJM footprint restrict deliverability
- 2 – 345 kV Facilities restrict deliverability

Flowgate Number	From Bus #	From Bus Name	To Bus #	To Bus Name	Circuit ID	From/To Voltage	From/To Area
1	239070	02RICHLD	238521	02NAOMI	1	138/138	202/202
2	243212	05BENTON	243250	05BENTON	1	345/138	205/205
3	271333	DIXON ; R	272517	STILLMAN ;RT	1	138/138	222/222
4	271835	KEWANEE ;23	271655	HENNEPIN ; T	1	138/138	222/222
5	247502	T-094	243212	05BENTON	1	345/345	205/205
6	247508	U2-090 C	243218	05DESOTO	1	345/345	205/205
7	272378	ROSCOE BE;BT	271638	HARLEM ; B	1	138/138	222/222
8	239316	02WASHREC	238864	02KNOX	1	138/138	202/202
9	242605	05CLNCHR	242606	05CLNLFD	1	138/138	205/205



# Inter-RTO Deliverability – PJM Results

## Deliverability Result for the MISO Transmission Facilities

- 168 Total facilities in the MISO footprint restrict deliverability
- 19 – 230 kV and above facilities restrict deliverability

AREA	69KV	115KV	120KV	138kV	161KV	230KV	345KV	500KV
218							3	
218/219							1	
326						1		
327								2
347								1
351	54	51	2	21	21	4		
502						1		
608						2		
608/620						1		
615						2		
652						1		
<b>Total</b>	<b>54</b>	<b>51</b>	<b>2</b>	<b>21</b>	<b>21</b>	<b>12</b>	<b>4</b>	<b>3</b>

## Inter-RTO Deliverability – MISO Results

Analysis Description	Total Generation (MW)	Approximate ER (MW)	Tested NR level (MW)	Calculated Restricted NR level (MW)	Calculated Deliverable Capacity Resources (MW)	Calculated Deliverable Capacity Resources (% of Tested NR )	Calculated Deliverable Capacity Resources (% of Total Generation)
MISO + PJM Joint Capacity Deliverability FF#1 - Step 3	424,017	44,047	379,970	7,367	372,603	98.06%	87.87%



## Next Steps

Present Fact Finding #1 Incremental Deliverability (Step 2) and the Fact Finding #2 results at the March 21<sup>st</sup> JCM.

Work on the cost to benefit analysis under Fact Finding #4 and update the stakeholders at the March 21<sup>st</sup> JCM

Post detailed report on the Capacity Deliverability Fact Finding analysis by March 31st

MISO and PJM to make recommendations based on the Fact Finding analysis and receive feedback from JCM stakeholders.

Initiate discussions on the resolution of issues 1-6 by utilizing the Fact Finding analyses.



# Appendix





# Intra-RTO Deliverability – MISO Results

List of MISO facilities that restrict deliverability:

FG	Fr Bus	Name	To Bus	Name	CKT	KVs	Areas
1	603061	BLK DOG7	603116	WILSON 7	1	115/115	600/600
2	603142	BAYFRNT7	605019	BAYFRNT88	7	115/88	600/600
3	605079	NEWULMS8	605282	NEWULMP8	1	69/69	600/600
4	605181	REDWING8	605374	BAY CIT8	1	69/69	600/600
5	605296	WSTSALE8	605316	LAX 8	1	69/69	600/600
6	605569	JAMESTP8	617247	GRE-JMSTWTP8	1	69/69	600/600
7	615347	GRE-MCHENRY4	615348	GRE-MCHENRY7	1	230/115	615/615
8	617034	GRE-BRAHAM 8	617046	GRE-GRASTON8	1	69/69	615/615
9	618415	GRE-WINTHRP8	618433	GRE-BRWN TP8	1	69/69	600/600
10	618431	GRE-BELL 8	618432	GRE-HSSNJCT8	1	69/69	600/600
11	618433	GRE-BRWN TP8	618436	GRE-SUMTER 8	1	69/69	600/600
12	630003	LANSING8	631053	LANSING5	1	69/161	627/627
13	630038	BRLGTN28	630616	S BURL 8	1	69/69	627/627
14	630381	SLAKEN 8	630385	SLAKES 8	1	69/69	627/627
15	630385	SLAKES 8	652569	CRESTON8	1	69/69	627/652
16	630443	ARISTAP8	630446	CRESTN8_	1	69/69	627/627
17	636301	FLOYD 8	636307	GREENTP8	1	69/69	635/635
18	680242	LUBLIN	680505	LAKEHEAD	1	69/69	680/680
19	680481	LUBLINTP	680505	LAKEHEAD	1	69/69	680/680
20	698568	DANZ AVE	699588	PULLIAM	1	69/69	696/696
21	630034	AGENCY 8	630615	4TH ST 8	1	69/69	627/627
22	344870	2KH2 XFMR	347195	2HAMLTNAM	1	69/69	356/357
23	340618	5LIVING	340621	5COLEEHV	1	161/161	314/314
24	350224	5MARIONPLANT	350223	2MARIONPLANT	2	161/69	361/361
25	303133	4VATCAN	335379	4SCOTT1	1	138/138	332/351
26	318090	2PRENTISS	318441	5PRENTISS	1	69/161	349/349
27	334026	4GRIMES	334060	4MT.ZION	1	138/138	351/351
28	334326	6CYPRESS	334328	6BEVIL	1	230/230	351/351
29	334327	6AMELIA	334328	6BEVIL	1	230/230	351/351
30	334413	4PNEC BK	334414	4LINDE	1	138/138	351/351





# Intra-RTO Deliverability – MISO Results

List of MISO facilities that restrict deliverability – continued:

FG	Fr Bus	Name	To Bus	Name	CKT	KVs	Areas
61	338130	5CALCR	505448	NORFORK5	1	161/161	327/515
62	338151	5NEWPO	338173	5NEW-IN	1	161/161	327/327
63	338161	5WM-EHV	338162	8WM-EHV	1	161/500	327/327
64	338172	5NEW-AB	338173	5NEW-IN	1	161/161	327/327
65	338213	5WALNUT	338705	5HOXIES#	1	161/161	327/327
66	338813	5MIDWAY#	505460	BULL SH5	1	161/161	327/515
67	500280	ELEESV 6	500770	RODEMR 6	1	230/230	502/502
68	250312	08BROOKJ	250792	08ROSEBG	1	69/69	208/208
69	250365	08CN30TH	250383	08CONERV	1	69/69	208/208
70	255160	17MARKTOWN_E	255258	17PRAXAIR-6	1	138/138	217/217
71	347831	4NEWTON	348126	4ROBNSNAM	1	138/138	357/357
72	350224	5MARIONPLANT	350223	2MARIONPLANT	1	161/69	361/361
73	248547	07WORTH8	249752	08HEBVST	1	138/138	207/208
74	249692	08BEDFRD	249756	08HEOWEN	1	138/138	208/208
75	249752	08HEBVST	249756	08HEOWEN	1	138/138	208/208
76	249834	08ROCKVL	250773	08RCKVIL	1	138/69	208/208
77	255127	17E_WINAMAC	255158	17MONTICELLO	1	138/138	217/217
78	264654	19STC4	265056	19TWR2497	1	120/120	219/219
79	264777	19MOHIC2	265056	19TWR2497	1	120/120	219/219

# Intra-RTO Deliverability – MISO Results

List of MISO facilities that restrict deliverability – continued:

FG	Fr Bus	Name	To Bus	Name	CKT	KVs	Areas
31	334413	4PNEC BK	334430	4SABINE	1	138/138	351/351
32	334414	4LINDE	334430	4SABINE	1	138/138	351/351
33	334434	6SABINE	334435	6MID CO	1	230/230	351/351
34	334434	6SABINE	334442	6GULFWAY	1	230/230	351/351
35	334436	6P AC BK	334437	6KOLBS	1	230/230	351/351
36	334439	6VFWPK	334442	6GULFWAY	1	230/230	351/351
37	335815	6PT.HUD	335825	6FANCY	1	230/230	351/351
38	335815	6PT.HUD	335825	6FANCY	2	230/230	351/351
39	336138	6FAIRVW	336190	6GYPSY	1	230/230	351/351
40	336138	6FAIRVW	500510	MADISON6	1	230/230	351/502
41	336462	6MICHO	500360	FRONTST6	1	230/230	351/502
42	336800	3B.WLSN	336960	3SE-VKS	1	115/115	326/326
43	337040	6ANDRUS	337042	3ANDRUS	1	230/115	326/326
44	337126	3BATESV	337135	3SARDIS	1	115/115	326/326
45	337310	3BVRCRK	500070	BC PST 4	1	115/138	351/502
46	337620	3WOODW-N	337962	3ALTHEI*	1	115/115	327/327
47	337651	8WH BLF	337957	8KEO	1	500/500	327/327
48	337685	3HSEHVW	337686	3ARKLA	1	115/115	327/327
49	337686	3ARKLA	337695	3TIGRE *	1	115/115	327/327
50	337686	3ARKLA	337740	3HSEHVE	2	115/115	327/327
51	337695	3TIGRE *	337697	3PANTH*	1	115/115	327/327
52	337697	3PANTH*	337705	3CHEETA*	1	115/115	327/327
53	337718	3CARPE	337746	3MALV-S	1	115/115	327/327
54	337740	3HSEHVE	337741	3BUTERF	1	115/115	327/327
55	337741	3BUTERF	337800	3HASKEL	1	115/115	327/327
56	337800	3HASKEL	337801	3BENT-S*	1	115/115	327/327
57	337801	3BENT-S*	337802	3BAUXIT	1	115/115	327/327
58	337949	3LYNCH-W	338755	3REMING#*	1	115/115	327/327
59	337962	3ALTHEI*	338738	3WABASEKA.W#	1	115/115	327/327
60	337964	3WABSKA	338738	3WABASEKA.W#	1	115/115	327/327



# Inter-RTO Deliverability – PJM Results

## List of MISO facilities that restrict deliverability:

FG #	Fr Bus	Name	To Bus	Name	CKT	KVs	Areas
1	249741	08GRTOW2	249796	08MAPLE	1	138/138	208/208
2	249796	08MAPLE	249704	08CHRYSS2	1	138/138	208/208
<a href="#">3</a>	999302	OAKC BK1	250737	08OKLND	1	1/69	208/208
4	999316	SPENCER	250830	08SPNC23	1	1/69	208/208
5	255158	17MONTICELLO	255127	17E_WINAMAC	1	138/138	217/217
<a href="#">6</a>	256002	18CAMPBL	999264	CAMPBELL5	5	345/1	218/218
7	256016	18MCV	256027	18TITBAW	1	345/345	218/218
8	256016	18MCV	256027	18TITBAW	2	345/345	218/218
<a href="#">9</a>	256071	18BILMRJ	256567	18BLENDON1	1	138/138	218/218
10	256263	18RONDO	256259	18RIGGSV	1	138/138	218/218
11	256322	18LOWELJ	256209	18MARQTT	1	138/138	218/218
<a href="#">12</a>	256524	18HWTHNJ	256566	18FOURMILEW	1	138/138	218/218
13	999264	CAMPBELL5	256095	18CAMPBELLB	5	1/138	218/218
14	256026	18THETFD	264580	19JEWEL	1	345/345	218/219
<a href="#">15</a>	264654	19STC4	265056	19TWR2497	1	120/120	219/219
16	265056	19TWR2497	264777	19MOHIC2	1	120/120	219/219
17	698879	SGR CK4	699360	NLK GV T	1	138/138	295/295
<a href="#">18</a>	698804	WHP SWS	698795	WPINE VI	1	69/69	295/698
19	698995	MASS	698805	LAKE MIN	1	69/69	295/698
20	336800	3B.WLSN	336804	3VKSBRG	1	115/115	326/326
<a href="#">21</a>	336800	3B.WLSN	336960	3SE-VKS	1	115/115	326/326
22	337040	6ANDRUS	337042	3ANDRUS	1	230/115	326/326
23	337060	3WINONA	337061	3SAWYR*	1	115/115	326/326
<a href="#">24</a>	337061	3SAWYR*	337062	3ELLIOT	1	115/115	326/326
25	337098	3CLARKMUN	337099	3CLARKD	1	115/115	326/326
26	337100	6MEPSCLK	337098	3CLARKMUN	1	230/115	326/326
<a href="#">27</a>	337100	6MEPSCLK	337107	6MOONLAK	1	230/230	326/326
28	337126	3BATESV	337135	3SARDIS	1	115/115	326/326
29	337136	3SNTOBI	337137	3CLDWTR	1	115/115	326/326
<a href="#">30</a>	337150	3HN LAK	337144	3GRNBRK	1	115/115	326/326

# Inter-RTO Deliverability – PJM Results

List of MISO facilities that restrict deliverability – continued:

31	337620	3WOODW-N	337962	3ALTHEI*	1	115/115	327/327
32	337651	8WH BLF	337957	8KEO	1	500/500	327/327
<a href="#">33</a>	337685	3HSEHVW	337734	3HS-IND	1	115/115	327/327
34	337686	3ARKLA	337685	3HSEHVW	1	115/115	327/327
35	337686	3ARKLA	337695	3TIGRE *	1	115/115	327/327
<a href="#">36</a>	337686	3ARKLA	337740	3HSEHVE	2	115/115	327/327
37	337695	3TIGRE *	337697	3PANTH*	1	115/115	327/327
38	337697	3PANTH*	337705	3CHEETA*	1	115/115	327/327
<a href="#">39</a>	337715	3HS-MIL	337714	3HS-ROY	1	115/115	327/327
40	337718	3CARPE	337746	3MALV-S	1	115/115	327/327
41	337733	3HS-UC	337731	3HS-E*	1	115/115	327/327
<a href="#">42</a>	337734	3HS-IND	337733	3HS-UC	1	115/115	327/327
43	337740	3HSEHVE	337741	3BUTERF	1	115/115	327/327
44	337741	3BUTERF	337800	3HASKEL	1	115/115	327/327
<a href="#">45</a>	337800	3HASKEL	337801	3BENT-S*	1	115/115	327/327
46	337801	3BENT-S*	337802	3BAUXIT	1	115/115	327/327
47	337808	8MABEL	337860	8KNWRIVL	1	500/500	327/327
<a href="#">48</a>	337939	5GOLDCR*	337926	5QUITMN	1	161/161	327/327
49	337962	3ALTHEI*	338738	3WABASEKA.W#	1	115/115	327/327
50	338151	5NEWPO	338173	5NEW-IN	1	161/161	327/327
<a href="#">51</a>	338152	5ISES-2	338142	5ISES-1	Z1	161/161	327/327
52	338162	8WM-EHV	338161	5WM-EHV	1	500/161	327/327
53	338169	5TRUMAN	338707	5TRUM-W#	1	161/161	327/327
<a href="#">54</a>	338173	5NEW-IN	338172	5NEW-AB	1	161/161	327/327
55	338705	5HOXIES#	338213	5WALNUT	1	161/161	327/327
56	338738	3WABASEKA.W#	337964	3WABSKA	1	115/115	327/327
<a href="#">57</a>	338161	5WM-EHV	338414	5WM-POK	1	161/161	327/334
58	338130	5CALCR	505448	NORFORK5	1	161/161	327/515
59	300123	5WPLAIN	301123	2WSTPL3	1	161/69	330/330
<a href="#">60</a>	300123	5WPLAIN	301123	2WSTPL3	2	161/69	330/330

# Inter-RTO Deliverability – PJM Results

## List of MISO facilities that restrict deliverability – continued:

61	300129	5WASHBRN	300763	2WASHBRN	1	161/69	330/330
62	300387	2BEVIER	300400	2MACNLK	1	69/69	330/330
<a href="#">63</a>	303190	4THOMPSN CRK	335808	4TP.STAR	1	138/138	332/351
64	360097	8VOLUNTEER	360102	8PHIPPS B NP	1	500/500	347/347
65	360724	5FREEPORT #1	365579	5OAKVILLE 44	1	161/161	347/347
<a href="#">66</a>	360724	5FREEPORT #1	365935	5SHELBY DR74	1	161/161	347/347
67	362014	2SOLWAY TN	362027	2TURKEY CRK	1	69/69	347/347
68	362027	2TURKEY CRK	362124	2LOVELL TN	1	69/69	347/347
<a href="#">69</a>	362122	2MELTON H HP	362496	2WATTROAD TN	1	69/69	347/347
70	362124	2LOVELL TN	362887	2CEDAR BLUFF	1	69/69	347/347
71	362128	2NOTTELY HP	362130	2NOTTELY GA	1	69/69	347/347
<a href="#">72</a>	362151	2COOEE #3 HP	362006	2BASIN TN	1	69/69	347/347
73	362186	2WATAUGA HP	362187	2ELIZABETH TN	1	69/69	347/347
74	362496	2WATTROAD TN	362124	2LOVELL TN	1	69/69	347/347
<a href="#">75</a>	365584	3N PRIMARY 32	365512	3FRONT ST 4	1	115/115	347/347
76	365584	3N PRIMARY 32	365903	3DUNLAP 76	1	115/115	347/347
77	365604	3S PRIMARY 31	365514	3THIRD ST 3	1	115/115	347/347
<a href="#">78</a>	318007	5MOROW161	318004	5PURVIS	1	161/161	349/349
79	318007	5MOROW161	318004	5PURVIS	2	161/161	349/349
80	318441	5PRENTISS	318090	2PRENTISS	1	161/69	349/349
<a href="#">81</a>	335379	4SCOTT1	303133	4VATCAN	1	138/138	351/332
82	335805	4PT HUD	303190	4THOMPSN CRK	1	138/138	351/332
83	336033	3TEREBN	303202	3GRENWD	1	115/115	351/332
<a href="#">84</a>	334026	4GRIMES	334060	4MT.ZION	1	138/138	351/351
85	334084	4CLVELND	334119	4TARKING	1	138/138	351/351
86	334271	2TEX-HIL	334270	2LOVELSL	1	69/69	351/351
<a href="#">87</a>	334326	6CYPRESS	334328	6BEVIL	1	230/230	351/351
88	334328	6BEVIL	334327	6AMELIA	1	230/230	351/351
89	334414	4LINDE	334413	4PNEC BK	1	138/138	351/351
<a href="#">90</a>	334430	4SABINE	334413	4PNEC BK	1	138/138	351/351

# Inter-RTO Deliverability – PJM Results

List of MISO facilities that restrict deliverability – continued:

91	334430	4SABINE	334414	4LINDE	1	138/138	351/351
92	334434	6SABINE	334442	6GULFWAY	1	230/230	351/351
<a href="#">93</a>	334437	6KOLBS	334436	6P AC BK	1	230/230	351/351
94	335589	4WYNDTTE	335590	4CONWAY	1	138/138	351/351
95	336037	3VLNTIN	336080	3CLOVEL	1	115/115	351/351
<a href="#">96</a>	336080	3CLOVEL	336081	3GMEADW	1	115/115	351/351
97	336280	39MILE	336084	3BARATA	1	115/115	351/351
98	337350	3TEXASE	337349	3LUCKY	1	115/115	351/351
<a href="#">99</a>	337351	3SAILES	337350	3TEXASE	1	115/115	351/351
100	337415	3STERLING%	337449	3OKRIDG	1	115/115	351/351
101	348921	4PRINCETN TP	348919	4LTV STL NTP	1	138/138	357/357
<a href="#">102</a>	350200	2CARRIERMILS	350213	2HAMILTON	99	69/69	361/361
103	350224	5MARIONPLANT	998913	MARION2	2	161/1	361/361
104	350224	5MARIONPLANT	998914	MARION1	1	161/1	361/361
<a href="#">105</a>	998913	MARION2	350223	2MARIONPLANT	2	1/69	361/361
106	998914	MARION1	350223	2MARIONPLANT	1	1/69	361/361
107	324114	7TRIMBLE	324314	4TRIMBLE	1	345/138	363/363
<a href="#">108</a>	324160	5RVR Q T	324159	5RIVER Q	1	161/161	363/363
109	324236	4CRUN 6	324237	4CRUNSS	1	138/138	363/363
110	324447	2BONNIE	324050	2JONESVILLE	1	69/69	363/363
<a href="#">111</a>	324554	2GRBURG	324830	2CMPBVEK	1	69/69	363/363
112	324977	2TOMSCT	324446	2BOND	1	69/69	363/363
113	324990	2WAITSBR	324787	2UNION U	1	69/69	363/363
<a href="#">114</a>	500770	RODEM 6	500280	ELEESV 6	1	230/230	502/502
115	505420	HERGETT5	998766	HGT X2	1	161/1	515/515
116	505420	HERGETT5	998767	HGT X1	1	161/1	515/515
<a href="#">117</a>	505438	POP BLF5	998761	PBL X3	1	161/1	515/515
118	998766	HGT X2	505423	HERGETT2	1	1/69	515/515
119	998767	HGT X1	505423	HERGETT2	1	1/69	515/515
<a href="#">120</a>	602024	MRSHLND5	605320	MARSHLA8	2	161/69	600/600

# Inter-RTO Deliverability – PJM Results

## List of MISO facilities that restrict deliverability – continued:

121	603061	BLK DOG7	603116	WILSON 7	1	115/115	600/600
122	605316	LAX 8	605296	WSTSALE8	1	69/69	600/600
<a href="#">123</a>	605569	JAMESTP8	617247	GRE-JMSTWTP8	1	69/69	600/600
124	615434	GRE-BURNVIL8	616963	GRE-COLNHLL8	1	69/69	600/600
125	615541	GRE-GLNDALE7	997892	115/69	1	115/1	600/600
<a href="#">126</a>	615541	GRE-GLNDALE7	997893	115/69	2	115/1	600/600
127	618415	GRE-WINTHRP8	618433	GRE-BRWN TP8	1	69/69	600/600
128	618433	GRE-BRWN TP8	618436	GRE-SUMTER 8	1	69/69	600/600
<a href="#">129</a>	997892	115/69	615542	GRE-GLNDALE8	1	1/69	600/600
130	997893	115/69	615542	GRE-GLNDALE8	2	1/69	600/600
131	605099	LTCHMUT8	613110	LITCHFLD	1	69/69	600/615
<a href="#">132</a>	608626	BOSWELL4	608629	CALUMET4	1	230/230	608/608
133	608628	MCARTHY4	608627	SHANNON4	1	230/230	608/608
134	608722	FORBES 7	608725	44L TAP7	1	115/115	608/608
<a href="#">135</a>	608730	78L TAP7	608733	NATIONL7	1	115/115	608/608
136	608600	BISONMP4	657756	SQBUTTE4	1	230/230	608/620
137	615347	GRE-MCHENRY4	997927	230/115	1	230/1	615/615
<a href="#">138</a>	615523	GRE-DEER RV7	997896	115/69	1	115/1	615/615
139	617056	GRE-MORA 8	613160	MORA	1	69/69	615/615
140	619975	GRE-WILLMAR4	997877	230/69	1	230/1	615/615
<a href="#">141</a>	997877	230/69	619977	GRE-WILLMAR8	1	1/69	615/615
142	997896	115/69	615524	GRE-DEER RV8	1	1/69	615/615
143	997927	230/115	615348	GRE-MCHENRY7	1	1/115	615/615
<a href="#">144</a>	630019	LIBERTY8	630489	NWVIENR8	1	69/69	627/627
145	630038	BRLGTN28	630616	S BURL 8	1	69/69	627/627
146	630128	HAYWD#18	630129	HAYWD#28	1	69/69	627/627
<a href="#">147</a>	630385	SLAKES 8	630381	SLAKEN 8	1	69/69	627/627
148	630615	4TH ST 8	630034	AGENCY 8	1	69/69	627/627
149	631045	WNBAGOS5	630097	WBGOJ S8	1	161/69	627/627
<a href="#">150</a>	631053	LANSING5	630003	LANSING8	1	161/69	627/627

# Inter-RTO Deliverability – PJM Results

## List of MISO facilities that restrict deliverability – continued:

151	631205	KARST5	631052	LANSINGW	1	161/161	627/627
152	631052	LANSINGW	681523	GENOA 5	1	161/161	627/680
<a href="#">153</a>	652510	FTRANDL7	640349	SPENCER7	1	115/115	652/640
154	652442	GARRISN7	652590	SNAKECR7	1	115/115	652/652
155	652453	TOWNER 7	659151	BOTTNOJCTCP7	1	115/115	652/652
<a href="#">156</a>	659151	BOTTNOJCTCP7	652455	BOTTNO 7	1	115/115	652/652
157	659347	PIONEER GEN7	659624	STATELINEMW7	1	115/115	652/652
158	661038	GLENHAM4	997624	GLENHAM TR1	1	230/1	652/652
<a href="#">159</a>	997624	GLENHAM TR1	661035	GLENHAM7	1	1/115	661/661
160	680242	LUBLIN	680505	LAKEHEAD	1	69/69	680/680
161	680505	LAKEHEAD	680481	LUBLINTP	1	69/69	680/680
<a href="#">162</a>	699788	NORTHPT	699786	ROCKY RN	1	115/115	696/696
163	698806	RKLAND	698995	MASS	1	69/69	698/295
164	698787	VICTORIA	698791	ROJT 2	1	69/69	698/698
<a href="#">165</a>	698791	ROJT 2	698806	RKLAND	1	69/69	698/698
166	698795	WPINE VI	698809	TOLLFREE	1	69/69	698/698
167	698805	LAKE MIN	698740	WINON TI	1	69/69	698/698
<a href="#">168</a>	698809	TOLLFREE	698787	VICTORIA	1	69/69	698/698



# Inter-RTO Deliverability – MISO Results

List of MISO facilities that restrict deliverability:

FG	Fr Bus	Name	To Bus	Name	CKT	KVs	Areas
1	603061	BLK DOG7	603116	WILSON 7	1	115/115	600/600
2	603142	BAYFRNT7	605019	BAYFRNT88	7	115/88	600/600
3	605079	NEWULMS8	605282	NEWULMP8	1	69/69	600/600
4	605084	WINTHRP8	618415	GRE-WINTHRP8	1	69/69	600/600
5	605181	REDWING8	605374	BAY CIT8	1	69/69	600/600
6	605296	WSTSALE8	605316	LAX 8	1	69/69	600/600
7	605569	JAMESTP8	617247	GRE-JMSTWTP8	1	69/69	600/600
8	615347	GRE-MCHENRY4	615348	GRE-MCHENRY7	1	230/115	615/615
9	615461	GRE-RUSH CY8	617048	GRE-RUSH TP8	1	69/69	615/615
10	617034	GRE-BRAHAM 8	617046	GRE-GRASTON8	1	69/69	615/615
11	618415	GRE-WINTHRP8	618433	GRE-BRWN TP8	1	69/69	600/600
12	618431	GRE-BELL 8	618432	GRE-HSSNJCT8	1	69/69	600/600
13	618433	GRE-BRWN TP8	618436	GRE-SUMTER 8	1	69/69	600/600
14	630003	LANSING8	631053	LANSING5	1	69/161	627/627
15	630038	BRLGTN28	630616	S BURL 8	1	69/69	627/627
16	630042	CNTRVL_8	630373	N CENT8	1	69/69	627/627
17	630048	WAPELLO8	631110	WAPELLO5	1	69/161	627/627
18	630048	WAPELLO8	631110	WAPELLO5	2	69/161	627/627
19	630381	SLAKEN 8	630385	SLAKES 8	1	69/69	627/627
20	630385	SLAKES 8	652569	CRESTON8	1	69/69	627/652
21	630443	ARISTAP8	630446	CRESTN8_	1	69/69	627/627
22	636301	FLOYD 8	636307	GREENTP8	1	69/69	635/635
23	680242	LUBLIN	680505	LAKEHEAD	1	69/69	680/680
24	680481	LUBLINTP	680505	LAKEHEAD	1	69/69	680/680
25	698568	DANZ AVE	699588	PULLIAM	1	69/69	696/696
26	699786	ROCKY RN	699788	NORTHPT	1	115/115	696/696
27	698840	ACEC BADGERW	699808	PETENWEL	1	138/138	694/696
28	338161	5WM-EHV	338162	8WM-EHV	1	161/500	327/327
29	344870	2KH2 XFMR	347195	2HAMLTNAM	1	69/69	356/357
30	250312	08BROOKJ	250792	08ROSEBG	1	69/69	208/208



# Inter-RTO Deliverability – MISO Results

List of MISO facilities that restrict deliverability – continued:

FG	Fr Bus	Name	To Bus	Name	CKT	KVs	Areas
31	250365	08CN30TH	250383	08CONERV	1	69/69	208/208
32	255160	17MARKTOWN_E	255258	17PRAXAIR-6	1	138/138	217/217
33	347831	4NEWTON	348126	4ROBNSNAM	1	138/138	357/357
34	350224	5MARIONPLANT	350223	2MARIONPLANT	1	161/69	361/361
35	350224	5MARIONPLANT	350223	2MARIONPLANT	2	161/69	361/361
36	248547	07WORTH8	249752	08HEBVST	1	138/138	207/208
37	249692	08BEDFRD	249756	08HEOWEN	1	138/138	208/208
38	249752	08HEBVST	249756	08HEOWEN	1	138/138	208/208
39	249834	08ROCKVL	250773	08RCKVIL	1	138/69	208/208
40	255127	17E_WINAMAC	255158	17MONTICELLO	1	138/138	217/217
41	264654	19STC4	265056	19TWR2497	1	120/120	219/219
42	264777	19MOHIC2	265056	19TWR2497	1	120/120	219/219
43	347946	4PANA	348068	4RAMSEY CIPS	1	138/138	357/357
44	303133	4VATCAN	335379	4SCOTT1	1	138/138	332/351
45	318090	2PRENTISS	318441	5PRENTISS	1	69/161	349/349
46	334326	6CYPRESS	334328	6BEVIL	1	230/230	351/351
47	334327	6AMELIA	334328	6BEVIL	1	230/230	351/351
48	334434	6SABINE	334435	6MID CO	1	230/230	351/351
49	334434	6SABINE	334442	6GULFWAY	1	230/230	351/351
50	334436	6P AC BK	334437	6KOLBS	1	230/230	351/351
51	334439	6VFWPK	334442	6GULFWAY	1	230/230	351/351
52	335815	6PT.HUD	335825	6FANCY	1	230/230	351/351
53	335815	6PT.HUD	335825	6FANCY	2	230/230	351/351
54	336138	6FAIRVW	336190	6GYPSY	1	230/230	351/351
55	336138	6FAIRVW	500510	MADISON6	1	230/230	351/502
56	336462	6MICHO	500360	FRONTST6	1	230/230	351/502
57	337040	6ANDRUS	337042	3ANDRUS	1	230/115	326/326
58	337098	3CLARKMUN	337099	3CLARKD	1	115/115	326/326
59	337098	3CLARKMUN	337100	6MEPCLK	1	115/230	326/326
60	337100	6MEPCLK	337107	6MOONLAK	1	230/230	326/326

# Inter-RTO Deliverability – MISO Results

List of MISO facilities that restrict deliverability – continued:

FG	Fr Bus	Name	To Bus	Name	CKT	KVs	Areas
61	337126	3BATESV	337135	3SARDIS	1	115/115	326/326
62	337310	3BVRCRK	500070	BC PST 4	1	115/138	351/502
63	337620	3WOODW-N	337962	3ALTHEI*	1	115/115	327/327
64	337651	8WH BLF	337957	8KEO	1	500/500	327/327
65	337686	3ARKLA	337695	3TIGRE *	1	115/115	327/327
66	337686	3ARKLA	337740	3HSEHVE	2	115/115	327/327
67	337695	3TIGRE *	337697	3PANTH*	1	115/115	327/327
68	337697	3PANTH*	337705	3CHEETA*	1	115/115	327/327
69	337718	3CARPE	337746	3MALV-S	1	115/115	327/327
70	337740	3HSEHVE	337741	3BUTERF	1	115/115	327/327
71	337741	3BUTERF	337800	3HASKEL	1	115/115	327/327
72	337800	3HASKEL	337801	3BENT-S*	1	115/115	327/327
73	337801	3BENT-S*	337802	3BAUXIT	1	115/115	327/327
74	337949	3LYNCH-W	338755	3REMIING#*	1	115/115	327/327
75	337962	3ALTHEI*	338738	3WABASEKA.W#	1	115/115	327/327
76	337964	3WABSKA	338738	3WABASEKA.W#	1	115/115	327/327
77	338130	5CALCR	505448	NORFORK5	1	161/161	327/515
78	338151	5NEWPO	338173	5NEW-IN	1	161/161	327/327
79	338172	5NEW-AB	338173	5NEW-IN	1	161/161	327/327
80	338213	5WALNUT	338705	5HOXIES#	1	161/161	327/327
81	500280	ELEESV 6	500770	RODEMUR 6	1	230/230	502/502
82	502405	BONIN 2	502408	STGEORG2	1	69/69	503/503
83	337685	3HSEHVW	337686	3ARKLA	1	115/115	327/327
84	238521	02NAOMI	239070	02RICHLD	1	138/138	202/202