MISO SPP DISIS-2015-002

Affected System Impact Study

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TABLE OF CONTENTS

TABLE OF TABLES

1. Executive Summary

This report documents the Affected System Impacts of nine projects in the SPP 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 SPP Study Generation Interconnection Projects

Queue#	Capacity	Service	Fuel Type	Area	Proposed Point of Interconnection
GEN-2015-046	300	ER	Wind	WAPA	Tande 345kV
GEN-2015-053	50	ER	Wind	NPPD	Antelope 115kV
GEN-2015-076	158.4	ER	Wind	NPPD	Belden 115kV
GEN-2015-087	66	ER/NR	Wind	NPPD	Tap Fairbury - Hebron 115kV
GEN-2015-088	300	ER/NR	Wind	NPPD	Tap Moore - Pauline 345kV
GEN-2015-091	101.2	ER	Wind	WAPA	Daglum 230kV
GEN-2015-096	150	ER	Wind	WAPA	Tap Belfied - Rhame 230kV
GEN-2015-097	100	ER	Wind	WAPA	Groton 115kV
GEN-2015-098	100	ER	Wind	WAPA	Mingusville 230kV

The total cost of network upgrades is listed in Table 1-2 as shown below. The costs for Network Upgrades are planning level estimates and subject to be revised in the facility studies.

Table 1-2 Constrained Facility and Mitigation Costs

Project	Facility Owner	Constraint	Mitigation Required	Cost Estimate
G097,G046,G091,G096,G098	ALTW MEC	Morgan Valley - Tiffin 345kV line	Structure replacement on the MEC owned section, projected new rating is 961 MVA.	$100,000
G053,G076,G087,G088	MEC	Bondurant - Montezuma 345 kV line	Structure replacements, wave trap replacement, CT setting changes, and relay setting changes, projected new rating is 1094 MVA.	$375,000

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 SPP group generation requests by the usage of MISO injection criteria, and applicable local planning criteria.

2.1.1. MISO Criteria

A branch is considered as a thermal injection constraint if the branch is loaded above its applicable normal or emergency rating for the post-change case, and any of the following conditions are met:

1) The generator (NR/ER) has a larger than 20% DF on the overloaded facility under post contingent condition or 5% DF under system intact condition, or
2) The megawatt impact due to the generator is greater than or equal to 20% of the applicable rating (normal or emergency) of the overloaded facility, or
3) The Cumulative MW Impact from study generators is greater than or equal to 20% of the applicable (normal or Emergency) facility rating, where study generators whose Individual MW Impact is greater than 5% of the facility rating will be responsible to mitigate the Cumulative MW Impact Constraint, or
4) The overloaded facility or the overload-causing contingency is at generator's outlet.

A bus is considered a voltage constraint if both of the following conditions are met. All voltage constraints must be resolved before a project can receive interconnection service

1) The bus voltage is outside of applicable normal or emergency limits for the post-change case, and
2) The change in bus voltage is greater than 0.01 per unit.

All generation projects in the study group must mitigate thermal injection constraints in order to obtain unconditional Interconnection Service.

2.1.2. TOS' LOCAL PLANNING CRITERIA

A constraint is identified as an injection constraint if it violates applicable Transmission Owner FERC filed Local Planning Criteria.

2.2. Contingency Criteria

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

- NERC Category P0 with system intact (no contingencies)
- NERC category P1, P2, P4, P5, P7 contingencies
    - Single element outages, at buses with a nominal voltage of 69 kV and above in the following areas: CWLD (area 333), AMMO (area 356), AMIL (area 357), CWLP (area 360), SIPC (area 361), WEC (area 295), MIUP (area 296), ALTE (area 694), WPS (area 696), MGE (area 697), UPPC (area 698), XCEL (area 600), MP (area 608),SMMPA (area 613), GRE (area 615), OTP (area 620), ITCM (area 627),MPW (area 633), MEC (area 635), MDU (area 661), DPC (area 680), CE(area 222), NPPD (area 640), OPPD (area 645), LES (area 650),WAPA (area 652), AECI (area 330), MIPU(area 540), KCPL (area 541),KACY (area 542), INDN (area 545).
    - Multiple-element outages initiated by a fault with normal clearing such as multi-terminal lines, in the Dakotas, Illinois, Iowa, Manitoba, Minnesota, Missouri, and Wisconsin.
- NERC Category P3
    - Selected NERC Category P3 events provided by ad-hoc study group in the study region of areas.
- For all the contingencies and post-disturbance analyses, cases were solved with transformer tap adjustment enabled, area interchange adjustment disabled, phase shifter adjustment enabled and switched shunt adjustment enabled.

2.3. Monitored Elements

Table 2-1 Monitored Area

Area #	Voltage	Area ID	Area Name
295	69kV and above	WEC	Wisconsin Electric Power Company (ATC)
296	69kV and above	MIUP	Michigan Upper Peninsula (ATC)
333	69kV and above	CWLD	Columbia, MO Water and Light
356	69kV and above	AMMO	Ameren Missouri
357	69kV and above	AMIL	Ameren Illinois
360	69kV and above	CWLP	City Water Light & Power(Springfield)
361	69kV and above	SIPC	Southern Illinois Power Co.
600	69kV and above	XEL	Xcel Energy North
608	69kV and above	MP	Minnesota Power & Light
613	69kV and above	SMMPA	Southern Minnesota Municipal Power Association
615	69kV and above	GRE	Great River Energy
620	69kV and above	OTP	Otter Tail Power Company
627	69kV and above	ALTW	Alliant Energy West
633	69kV and above	MPW	Muscatine Power & Water
635	69kV and above	MEC	MidAmerican Energy
661	69kV and above	MDU	Montana-Dakota Utilities Co.
680	69kV and above	DPC	Dairyland Power Cooperative
694	69kV and above	ALTE	Alliant Energy East (ATC)
696	69kV and above	WPS	Wisconsin Public Service Corporation (ATC)
697	69kV and above	MGE	Madison Gas and Electric Company (ATC)
698	69kV and above	UPPC	Upper Peninsula Power Company (ATC)

2.4. Model Development

The following MTEP15 base case load profiles were used for the study:

- 2020 Summer Shoulder
- 2020 Summer Peak

The study cases were built by adding and dispatching the appropriate MISO queue projects (up to DPP-2015-AUG) and SPP queue projects to the base cases. The details of each SPP interconnection request study projects are listed in Table 1-1. The SPP study projects and SPP

higher queued projects were dispatched per MISO criteria to the entire SPP footprint, where generators were scaled in proportion to the available reserve, SPP higher queued project are listed in Appendix A.

2.5. Study Assumptions

This affected system impact study was conducted with all the participating generators and higher queued SPP generators divided into two groups considering the large amount of wind in the queue. Group 1 includes higher queued SPP generators and requested study SPP generators in South Dakota and North Dakota. Group 2 includes higher queued SPP generators and requested SPP study generators in Nebraska, Missouri and Kansas. In summer shoulder scenario wind are dispatched at 100% nameplate in study group and 20% nameplate in non-study group. In summer peak scenario wind are dispatched at 20% in both groups. Higher queued SPP 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 made during the development of the study models is revised.

3. Steady State Analysis

3.1. Summer Peak (2020) Analysis

No constraints were identified in 2020 Summer Peak Scenario.

3.2. Summer Shoulder (2020) Analysis

The following constraints were identified in the 2020 Summer Shoulder Analysis. Proposed mitigations are listed in the table below.

Table 3-1 Group 1(ND, SD) 2020SH Constraint

Scenario	Constraint	Contflow (MVA)	Rating (MVA)	Loading (%)	Contingency	G097	G046	G091	G096	G098
2020SH-NSD	631148 MORGANV3 345 636420 TIFFIN 3 345 1 note 1	884.67	846	104.57	** BASE CASE **	6.79%	6.56%	6.37%	6.39%	6.38%
2020SH-NSD	601006 SPLT RK3 345 652537 WHITE 3 345 1 note 2	968.82	717.1	135.10	P71:345-345:GRE:CMT-LYC CKT 1 & 2	23.58%	12.61%	12.32%	12.44%	12.29%
2020SH-NSD	601006 SPLT RK3 345 652537 WHITE 3 345 1	964.48	717.1	134.50	10215 H081_SUB 345 601048 LYON CO 3 345 1	23.75%	12.23%	11.95%	12.07%	11.92%
2020SH-NSD	601006 SPLT RK3 345 652537 WHITE 3 345 1	954.77	717.1	133.14	P71:345-345:GRE:CMT-HLE CKT 1 & 2	23.50%	12.64%	12.34%	12.46%	12.31%
2020SH-NSD	601006 SPLT RK3 345 652537 WHITE 3 345 1	911.05	717.1	127.05	10215 H081_SUB 345 601031 BRKNGCO3 345 1	23.75%	12.23%	11.95%	12.07%	11.92%
2020SH-NSD	601006 SPLT RK3 345 652537 WHITE 3 345 1	910.58	717.1	126.98	P23P:345:XEL:3X35 BOK PRESENT	23.75%	12.23%	11.95%	12.07%	11.92%
2020SH-NSD	601006 SPLT RK3 345 652537 WHITE 3 345 1	718.08	717.1	100.14	** BASE CASE **	19.96%	11.22%	10.76%	10.88%	10.75%

Table 3-2 Group 2(NE, KS, MO) 2020SH Constraints

Scenario	Constraint	Contflow (MVA)	Rating (MVA)	Loading (%)	Contingency	G053	G076	G087	G088
2020SH-NEB	635680 BONDRNT3 345 635730 MNTZUMA3 345 1 note 3	1072.52	926	115.8234	** BASE CASE **	7.64%	7.47%	7.16%	7.84%

- Note 1: $100,000 for a structure replacement presently on the MidAmerican-owned section. Projected rating after upgrades: 961 MVA
- Note 2: XEL's equipment rating has changed and the existing limiting element of the White-Split Rock 345 kV line is Summer Continuous (Emergency) = 1057 MVA (1057 MVA) WAPA Substation Conductor, Winter Continuous (Emergency) = 1075.6 MVA (1075.6 MVA) NSP Breaker CT.
- Note 3: $375,000 for structure replacements, wave trap replacement, CT setting changes, and relay setting changes. Projected rating after upgrades: 1094 MVA

4. Conclusion

The Affected system study identified Steady State thermal violations associated with the interconnection of the nine SPP projects. The study identified injection constraints in the off peak scenario for the five year out (2020) analysis. Network upgrades were identified and cost allocation was performed. A summary of cost estimates identified for each scenario is provided in Table 1-2, detailed information regarding network upgrades is provided in section 3 of this report.

The generators which have impacts on the MISO system will need to mitigate for the identified constraints prior to being granted full injection on the SPP system. If the generator would elect to proceed on a limited operation basis, then the impacting generator(s) will be subject to injection limits identified from MISO's Annual and Quarterly studies.

5. Appendix A SPP Higher Queued Projects

Table 5-1 SPP High Queued Projects

SPP Queue#	GEN Area	Pmax (MW)	Service	Type	State	POI
GEN-2003-021N	NPPD	60	ER	Wind	NE	Ainsworth Wind Tap 115kV
GEN-2003-021N	NPPD	15	ER	Wind	NE	Ainsworth Wind Tap 115kV
GEN-2004-023N	NPPD	75	ER	Coal	NE	Columbus Co 115kV
GEN-2006-020N	NPPD	42	ER	Wind	NE	Bloomfield 115kV
GEN-2006-038N005	NPPD	80	ER	Wind	NE	Broken Bow 115kV
GEN-2006-038N019	NPPD	80	ER	Wind	NE	Petersburg North 115kV
GEN-2007-011N08	NPPD	81	ER	Wind	NE	Bloomfield 115kV
GEN-2008-119O	OPPD	60	ER	Wind	NE	S1399 161kV
GEN-2006-037N1	NPPD	74.8	ER	Wind	NE	Broken Bow 115kV
GEN-2006-044N	NPPD	40.5	ER	Wind	NE	North Petersburg 115kV
GEN-2008-086N02	NPPD	100.3	ER	Wind	NE	Meadow Grove 230kV
GEN-2008-086N02	NPPD	100.3	ER	Wind	NE	Meadow Grove 230kV
GEN-2008-129	KCPL	40	ER	CT	MO	Pleasant Hill 161kV
GEN-2008-129	KCPL	40	ER	CT	MO	Pleasant Hill 161kV
GEN-2009-040	WERE	73.8	ER	Wind	KS	Tap Smittyville - Knob Hill 115KV
GEN-2010-041	OPPD	10.5	ER	Wind	NE	S1399 161kV
GEN-2010-051	NPPD	200	ER	Wind	NE	Tap Twin Church - Hoskins 230kV
GEN-2010-036	WERE	0.15	ER	Hydro	KS	6th Street 115kV
GEN-2010-036	WERE	0.18	ER	Hydro	KS	6th Street 115kV
GEN-2010-036	WERE	0.2	ER	Hydro	KS	6th Street 115kV
GEN-2010-036	WERE	0.17	ER	Hydro	KS	6th Street 115kV
GEN-2010-036	WERE	0.2	ER	Hydro	KS	6th Street 115kV
GEN-2010-036	WERE	1.3	ER	Hydro	KS	6th Street 115kV
GEN-2010-036	WERE	1	ER	Hydro	KS	6th Street 115kV
GEN-2010-036	WERE	0.2	ER	Hydro	KS	6th Street 115kV
GEN-2010-036	WERE	1	ER	Hydro	KS	6th Street 115kV
GEN-2010-036	WERE	1.3	ER	Hydro	KS	6th Street 115kV
GEN-2010-036	WERE	0.2	ER	Hydro	KS	6th Street 115kV
GEN-2011-018	NPPD	73.6	ER/NR	Wind	NE	Steele City 115kV
GEN-2011-027	NPPD	120	ER/NR	Wind	NE	Tap Twin Church Hoskins 230kV
GEN-2011-011	KCPL	50	ER	Coal	MO	Iatan 345kV
GEN-2011-056	NPPD	3.6	ER	Hydro	NE	Jeffrey 115kV
GEN-2011-056A	NPPD	3.6	ER	Hydro	NE	John 1 115kV
GEN-2011-056B	NPPD	4.5	ER	Hydro	NE	John 2 115kV
NPPD Distributed (North Platte - Lexington)	NPPD	18	ER	Hydro	NE	Jeffrey 115kV
NPPD Distributed (North Platte - Lexington)	NPPD	18	ER	Hydro	NE	Johnson No. 1 115kV

SPP Queue#	GEN Area	Pmax (MW)	Service	Type	State	POI
NPPD Distributed (North Platte - Lexington)	NPPD	18	ER	Hydro	NE	Johnson No. 2 115kV
GEN-2012-021	LES	4.8	ER	Gas	NE	Terry Bundy Generating Station 115kV
GEN-2013-002	LES	50.6	ER/NR	Wind	NE	Sheldon - Folsom & Pleasant Hill 115kV CKT 2
GEN-2013-008	NPPD	1.2	ER	Wind	NE	Steele City 115kV
GEN-2013-019	LES	73.6	ER/NR	Wind	NE	Tap Sheldon - Folsom & Pleasant Hill (GEN-2013-002 Tap) 115kV CKT 2
GEN-2013-032	NPPD	204	ER	Wind	NE	Antelope 115kV
GEN-2014-004	NPPD	3.96	ER	Wind	NE	Steele City 115kV (GEN-2011-018 POI)
GEN-2014-013	NPPD	73.5	ER/NR	Wind	NE	Meadow Grove (GEN-2008-086N2 Sub) 230kV
GEN-2014-031	NPPD	35.8	ER/NR	Wind	NE	Meadow Grove 230kV
GEN-2014-032	NPPD	5.11	ER/NR	Wind	NE	Meadow Grove 230kV
GEN-2014-032	NPPD	5.11	ER/NR	Wind	NE	Meadow Grove 230kV
GEN-2014-039	NPPD	73.39	ER/NR	Wind	NE	Friend 115kV
GEN-2014-021	KCPL	158	ER/NR	Wind	MO	Tap Nebraska City - Mullin Creek 345kV
GEN-2014-021	KCPL	142	ER/NR	Wind	MO	Tap Nebraska City - Mullin Creek 345kV
GEN-2015-007	NPPD	160	ER	Wind	NE	Hoskins 345 kV
GEN-2007-017IS	WAPA	166	ER/NR	Wind	NE	Grand Prairie 345kV
GEN-2007-018IS	WAPA	234	ER/NR	Wind	NE	Grand Prairie 345kV
GEN-2015-023	NPPD	150.36	ER/NR	Wind	NE	Holt County 345kV substation
GEN-2015-023	NPPD	150.36	ER/NR	Wind	NE	Holt County 345kV substation
GEN-2015-005	KCPL	16.11	ER	Wind	MO	Tap Nebraska City – Sibley 345kV
GEN-2015-005	KCPL	184	ER	Wind	MO	Tap Nebraska City – Sibley 345kV
GEN-2002-009IS	WAPA	40.5	ER/NR	Wind	SD	FT THOMPSON 69kV
GEN-2007-013IS	WAPA	50	ER/NR	Wind	SD	WESSINGTON 230kV
GEN-2007-014IS	WAPA	100	ER/NR	Wind	SD	WESSINGTON 230kV
GEN-2009-018IS	WAPA	99.5	ER	Wind	SD	GROTON 115kV
GEN-2010-003IS	WAPA	34	ER/NR	Wind	SD	WESSINGTON 230kV
GEN-2013-009IS	WAPA	19.5	ER	Wind	SD	REDFIELD 69kV
GEN-2007-023IS	WAPA	49.5	ER/NR	Wind	SD	SUMMIT 115kV
GEN-2013-001IS	WAPA	89.7	ER	Wind	SD	SUMMIT 115kV
GEN-2010-001IS	WAPA	99	ER/NR	Wind	SD	Mound City 230kV 230kV
GEN-2009-001IS	WAPA	200	ER/NR	Wind	SD	Groton - Watertown 345kV
GEN-2012-014IS	WAPA	100.34	ER	Wind	SD	GROTON 115kV

SPP Queue#	GEN Area	Pmax (MW)	Service	Type	State	POI
GEN-2014-001IS	WAPA	103.7	ER	Wind	SD	MARTIN - NEWELL 115kV
GEN-2005-008IS	WAPA	49.5	ER/NR	Wind	ND	Hilken 230 230kV
GEN-2006-015IS	WAPA	49.5	ER/NR	Wind	ND	Hilken 230 230kV
GEN-2007-027IS	WAPA	99	ER/NR	Wind	ND	Baldwin 230 230kV
GEN-2010-007IS	WAPA	172.5	ER/NR	Wind	ND	ANTELOPE VALLEY 345kV
GEN-2009-026IS	WAPA	106.5	ER/NR	Wind	ND	Hebron 230kV
GEN-2014-014IS	WAPA	151.5	ER/NR	Wind	ND	DAGLUM 4 230kV
GEN-2014-006IS	WAPA	47	ER/NR	Gas	ND	Lonesome Creek Units 4&5 Collector 115kV
GEN-2014-006IS	WAPA	47	ER/NR	Gas	ND	Lonesome Creek Units 4&5 Collector 115kV
GEN-2014-006IS	WAPA	9.44	ER/NR	Gas	ND	Pioneer Station 115 Recip Gen Collector 115kV
GEN-2014-006IS	WAPA	9.44	ER/NR	Gas	ND	Pioneer Station 115 Recip Gen Collector 115kV
GEN-2014-006IS	WAPA	9.44	ER/NR	Gas	ND	Pioneer Station 115 Recip Gen Collector 115kV
GEN-2014-006IS	WAPA	9.44	ER/NR	Gas	ND	Pioneer Station 115 Recip Gen Collector 115kV
GEN-2014-006IS	WAPA	9.44	ER/NR	Gas	ND	Pioneer Station 115 Recip Gen Collector 115kV
GEN-2014-006IS	WAPA	9.44	ER/NR	Gas	ND	Pioneer Station 115 Recip Gen Collector 115kV
GEN-2014-006IS	WAPA	9.44	ER/NR	Gas	ND	Pioneer Station 115 Recip Gen Collector 115kV
GEN-2014-006IS	WAPA	9.44	ER/NR	Gas	ND	Pioneer Station 115 Recip Gen Collector 115kV
GEN-2014-006IS	WAPA	9.44	ER/NR	Gas	ND	Pioneer Station 115 Recip Gen Collector 115kV
GEN-2014-006IS	WAPA	9.44	ER/NR	Gas	ND	Pioneer Station 115 Recip Gen Collector 115kV
GEN-2014-006IS	WAPA	9.44	ER/NR	Gas	ND	Pioneer Station 115 Recip Gen Collector 115kV
GEN-2014-006IS	WAPA	9.44	ER/NR	Gas	ND	Pioneer Station 115 Recip Gen Collector 115kV
GEN-2012-006IS	WAPA	47	ER/NR	Gas	ND	Lonesome Creek Units 4&5 Collector 115kV
GEN-2014-010IS	WAPA	150	ER/NR	Wind	ND	Neset 115 kV Bus 115kV
GEN-2014-004IS	WAPA	384.2	ER/NR	Wind	ND	CHARLIE CREEK 345kV
GEN-2015-042	NPPD	280	ER	Wind	NE	DIXONCO 230kV

6. Appendix B Study Scenarios and Study Contingencies

Table 6-1 Study Scenarios and Study Contingencies

Study_year	Con File	Con Type	Num of Contingency
2020SH-NSD	2020_MDU-MTEP15-2020-P1.con	P1	83
2020SH-NSD	MEC DPP2015 AUG 2020 Cat P1.con	P1	124
2020SH-NSD	2020_MPW_MTEP15_Cat_P1_2015.con	P1	21
2020SH-NSD	2020_MRO-MN Region-P1-Single Contingency.con	P1	467
2020SH-NSD	2020_MTEP15_2020_CATP1_ITCM.con	P1	70
2020SH-NSD	2020_MTEP15_Ames_P1.con	P1	9
2020SH-NSD	2020_MTEP15_CFU_P1.con	P1	10
2020SH-NSD	P1-P2_ATC_20250715_DPP.con	P1	4429
2020SH-NSD	Without_SPS_MN_2020.con	P1	5
2020SH-NSD	2020_MDU-MTEP15-2020-P2_b.con	P2	122
2020SH-NSD	2020_MDU-MTEP15-2020-P4_b.con	P4	151
2020SH-NSD	2020_MDU-MTEP15-2020-P7.con	P7	1
2020SH-NSD	MEC DPP2015 AUG 2020 Cat P2.con	P2	390
2020SH-NSD	MEC DPP2015 AUG 2020 Cat P4.con	P4	370
2020SH-NSD	MEC DPP2015 AUG 2020 Cat P5.con	P5	34
2020SH-NSD	MEC DPP2015 AUG 2020 Cat P7.con	P7	41
2020SH-NSD	2020_MPW_MTEP15_Cat_P2_2015.con	P2	22
2020SH-NSD	2020_MPW_MTEP15_Cat_P5_2015.con	P5	1
2020SH-NSD	2020_MPW_MTEP15_Cat_P7_2015.con	P7	4
2020SH-NSD	2020_MRO-MN Region-P2-Single Contingency.con	P2	1115
2020SH-NSD	2020_MRO-MN Region-P4-P5-P7 Multiple Contingency.con	P4P5P7	156
2020SH-NSD	2020_MTEP15_2020_CATP2_ITCM.CON	P2	142
2020SH-NSD	2020_MTEP15_2020_CATP4_ITCM.con	P4	117
2020SH-NSD	2020_MTEP15_2020_CATP5_ITCM.CON	P5	9
2020SH-NSD	2020_MTEP15_2020_CATP7_ITCM.CON	P7	32
2020SH-NSD	2020_MTEP15_Ames_P2.con	P2	6
2020SH-NSD	2020_MTEP15_Ames_P457.con	P4P5P7	3
2020SH-NSD	2020_MTEP15_CFU_P2.con	P2	8
2020SH-NSD	P5_ATC_20250715_DPP.con	P5	141
2020SH-NSD	P7_ATC_20250715_DPP.con	P7	209
2020SH-NSD	DISIS_ATC_P1.con	P1	2489
2020SH-NSD	DISIS_Central_P1.con	P1	1411
2020SH-NSD	DISIS_Seams_P1.con	P1	5215

2020SH-NSD	DISIS_West_P1.con	P1	8575
2020SH-NSD	2020_AMRN-P2-1 2020.con	P2-1	288
2020SH-NSD	2020_AMRN-P2-2 2020.con	P2-2	204
2020SH-NSD	2020_AMRN-P2-3 2020.con	P2-3	333
2020SH-NSD	2020_AMRN-P2-4 2020.con	P2-4	139
2020SH-NSD	2020_AMRN-P7-1 2020.con	P7-1	89
2020SH-NSD	2020_P2_Explicit_CWLD.con	P2	11
2020SH-NSD	2020_P4_Explicit_CWLD.con	P4	16
2020SH-NSD	2020_P7_Explicit_CWLD.con	P7	14
2020SH-NSD	2020_P2_Explicit_SIPC.con	P2	9
2020SH-NSD	2020_P4_Explicit_SIPC.con	P4	10
2020SH-NSD	2020_CWLP_MTEP15_CatP2.con	P2	83
2020SH-NSD	2020_CWLP_MTEP15_CatP7.con	P7	1
2020SH-NSD	ComEd_RTEP_Cat_P2-P7.con	P2-P7	1163
2020SH-NSD	ComEd_RTEP_Cat_P1.con	P1	467
2020SH-NEB	2020_MDU-MTEP15-2020-P1.con	P1	83
2020SH-NEB	MEC DPP2015 AUG 2020 Cat P1.con	P1	124
2020SH-NEB	2020_MPW_MTEP15_Cat_P1_2015.con	P1	21
2020SH-NEB	2020_MRO-MN Region-P1-Single Contingency.con	P1	467
2020SH-NEB	2020_MTEP15_2020_CATP1_ITCM.con	P1	70
2020SH-NEB	2020_MTEP15_Ames_P1.con	P1	9
2020SH-NEB	2020_MTEP15_CFU_P1.con	P1	10
2020SH-NEB	P1-P2_ATC_20250715_DPP.con	P1	4429
2020SH-NEB	Without_SPS_MN_2020.con	P1	5
2020SH-NEB	2020_MDU-MTEP15-2020-P2_b.con	P2	122
2020SH-NEB	2020_MDU-MTEP15-2020-P4_b.con	P4	151
2020SH-NEB	2020_MDU-MTEP15-2020-P7.con	P7	1
2020SH-NEB	MEC DPP2015 AUG 2020 Cat P2.con	P2	390
2020SH-NEB	MEC DPP2015 AUG 2020 Cat P4.con	P4	370
2020SH-NEB	MEC DPP2015 AUG 2020 Cat P5.con	P5	34
2020SH-NEB	MEC DPP2015 AUG 2020 Cat P7.con	P7	41
2020SH-NEB	2020_MPW_MTEP15_Cat_P2_2015.con	P2	22
2020SH-NEB	2020_MPW_MTEP15_Cat_P5_2015.con	P5	1
2020SH-NEB	2020_MPW_MTEP15_Cat_P7_2015.con	P7	4
2020SH-NEB	2020_MRO-MN Region-P2-Single Contingency.con	P2	1115
2020SH-NEB	2020_MRO-MN Region-P4-P5-P7 Multiple Contingency.con	P4P5P7	156
2020SH-NEB	2020_MTEP15_2020_CATP2_ITCM.CON	P2	142
2020SH-NEB	2020_MTEP15_2020_CATP4_ITCM.con	P4	117
2020SH-NEB	2020_MTEP15_2020_CATP5_ITCM.CON	P5	9

2020SH-NEB	2020_MTEP15_2020_CATP7_ITCM.CON	P7	32
2020SH-NEB	2020_MTEP15_Ames_P2.con	P2	6
2020SH-NEB	2020_MTEP15_Ames_P457.con	P4P5P7	3
2020SH-NEB	2020_MTEP15_CFU_P2.con	P2	8
2020SH-NEB	P5_ATC_20250715_DPP.con	P5	141
2020SH-NEB	P7_ATC_20250715_DPP.con	P7	209
2020SH-NEB	DISIS_ATC_P1.con	P1	2489
2020SH-NEB	DISIS_Central_P1.con	P1	1411
2020SH-NEB	DISIS_Seams_P1.con	P1	5215
2020SH-NEB	DISIS_West_P1.con	P1	8575
2020SH-NEB	2020_AMRN-P2-1 2020.con	P2-1	288
2020SH-NEB	2020_AMRN-P2-2 2020.con	P2-2	204
2020SH-NEB	2020_AMRN-P2-3 2020.con	P2-3	333
2020SH-NEB	2020_AMRN-P2-4 2020.con	P2-4	139
2020SH-NEB	2020_AMRN-P7-1 2020.con	P7-1	89
2020SH-NEB	2020_P2_Explicit_CWLD.con	P2	11
2020SH-NEB	2020_P4_Explicit_CWLD.con	P4	16
2020SH-NEB	2020_P7_Explicit_CWLD.con	P7	14
2020SH-NEB	2020_P2_Explicit_SIPC.con	P2	9
2020SH-NEB	2020_P4_Explicit_SIPC.con	P4	10
2020SH-NEB	2020_CWLP_MTEP15_CatP2.con	P2	83
2020SH-NEB	2020_CWLP_MTEP15_CatP7.con	P7	1
2020SH-NEB	ComEd_RTEP_Cat_P2-P7.con	P2-P7	1163
2020SH-NEB	ComEd_RTEP_Cat_P1.con	P1	467
2020SP	2020_MDU-MTEP15-2020-P1.con	P1	83
2020SP	MEC DPP2015 AUG 2020 Cat P1.con	P1	124
2020SP	2020_MPW_MTEP15_Cat_P1_2015.con	P1	21
2020SP	2020_MRO-MN Region-P1-Single Contingency.con	P1	467
2020SP	2020_MTEP15_2020_CATP1_ITCM.con	P1	70
2020SP	2020_MTEP15_Ames_P1.con	P1	9
2020SP	2020_MTEP15_CFU_P1.con	P1	10
2020SP	P1-P2_ATC_20250715_DPP.con	P1	4429
2020SP	Without_SPS_MN_2020.con	P1	5
2020SP	2020_MDU-MTEP15-2020-P2_b.con	P2	122
2020SP	2020_MDU-MTEP15-2020-P4_b.con	P4	151
2020SP	2020_MDU-MTEP15-2020-P7.con	P7	1
2020SP	MEC DPP2015 AUG 2020 Cat P2.con	P2	390
2020SP	MEC DPP2015 AUG 2020 Cat P4.con	P4	370
2020SP	MEC DPP2015 AUG 2020 Cat P5.con	P5	34

2020SP	MEC DPP2015 AUG 2020 Cat P7.con	P7	41
2020SP	2020_MPW_MTEP15_Cat_P2_2015.con	P2	22
2020SP	2020_MPW_MTEP15_Cat_P5_2015.con	P5	1
2020SP	2020_MPW_MTEP15_Cat_P7_2015.con	P7	4
2020SP	2020_MRO-MN Region-P2-Single Contingency.con	P2	1115
2020SP	2020_MRO-MN Region-P4-P5-P7 Multiple Contingency.con	P4P5P7	156
2020SP	2020_MTEP15_2020_CATP2_ITCM.CON	P2	142
2020SP	2020_MTEP15_2020_CATP4_ITCM.con	P4	117
2020SP	2020_MTEP15_2020_CATP5_ITCM.CON	P5	9
2020SP	2020_MTEP15_2020_CATP7_ITCM.CON	P7	32
2020SP	2020_MTEP15_Ames_P2.con	P2	6
2020SP	2020_MTEP15_Ames_P457.con	P4P5P7	3
2020SP	2020_MTEP15_CFU_P2.con	P2	8
2020SP	P5_ATC_20250715_DPP.con	P5	141
2020SP	P7_ATC_20250715_DPP.con	P7	209
2020SP	DISIS_ATC_P1.con	P1	2489
2020SP	DISIS_Central_P1.con	P1	1411
2020SP	DISIS_Seams_P1.con	P1	5215
2020SP	DISIS_West_P1.con	P1	8575
2020SP	2020_AMRN-P2-1 2020.con	P2-1	288
2020SP	2020_AMRN-P2-2 2020.con	P2-2	204
2020SP	2020_AMRN-P2-3 2020.con	P2-3	333
2020SP	2020_AMRN-P2-4 2020.con	P2-4	139
2020SP	2020_AMRN-P7-1 2020.con	P7-1	89
2020SP	2020_P2_Explicit_CWLD.con	P2	11
2020SP	2020_P4_Explicit_CWLD.con	P4	16
2020SP	2020_P7_Explicit_CWLD.con	P7	14
2020SP	2020_P2_Explicit_SIPC.con	P2	9
2020SP	2020_P4_Explicit_SIPC.con	P4	10
2020SP	2020_CWLP_MTEP15_CatP2.con	P2	83
2020SP	2020_CWLP_MTEP15_CatP7.con	P7	1
2020SP	ComEd_RTEP_Cat_P2-P7.con	P2-P7	1163
2020SP	ComEd_RTEP_Cat_P1.con	P1	467