



414 Nicollet Mall  
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January 3, 2018

—Via Electronic Filing—

Daniel P. Wolf  
Executive Secretary  
Minnesota Public Utilities Commission  
121 7<sup>th</sup> Place East, Suite 350  
St. Paul, MN 55101

RE: NERC 2017 LONG-TERM RELIABILITY ASSESSMENT  
2017 BIENNIAL TRANSMISSION PROJECTS REPORT  
DOCKET NO. E999/M-17-377

Dear Mr. Wolf:

On November 21, 2017, in response to a request by the Department of Commerce, the Minnesota Transmission Owners (MTO) submitted the pertinent pages for the MRO-MAPP load and capability report from the most current NERC Long-Term Reliability Assessment, which was for 2016.

On December 13, 2017, the 2017 NERC Long-Term Reliability Assessment became available electronically. Accordingly, the MTO is filing the latest MRO-MAPP load and capability report which can be found on pages 10, 41 and 42 of the 2017 Assessment. The full report is available at the following link:  
[http://www.nerc.com/pa/RAPA/ra/Reliability%20Assessments%20DL/NERC\\_LTR\\_A\\_12132017\\_Final.pdf](http://www.nerc.com/pa/RAPA/ra/Reliability%20Assessments%20DL/NERC_LTR_A_12132017_Final.pdf)

With this submission of the 2017 data, the MTO has provided the best available load and capability information from the regional reliability council, as required under Minn. R. 7848.1300 (B), and the 2017 Biennial Transmission Projects Report is complete.

If you have any other questions about this filing, please contact Jody Londo at [jody.l.londo@xcelenergy.com](mailto:jody.l.londo@xcelenergy.com) or (612) 330-5601.

Sincerely,

/s/

BRIA E. SHEA  
DIRECTOR, REGULATORY AND STRATEGIC ANALYSIS

Enclosure  
c: Service List

**NERC**

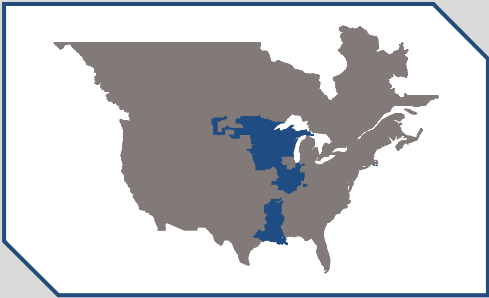
NORTH AMERICAN ELECTRIC  
RELIABILITY CORPORATION

**2017 Long-Term Reliability Assessment**



Table 1: Planning Reserve Margin Years (2018–2022)						
Assessment Area	Reserve Margins	2018	2019	2020	2021	2022
FRCC	Anticipated	21.36	22.50	22.49	21.35	23.78
	Prospective	22.49	23.89	23.65	23.48	25.89
	Reference Margin Level	15.0	15.00	15.00	15.00	15.00
MISO	Anticipated	19.23	19.79	19.38	18.93	17.28
	Prospective	26.18	28.45	33.35	34.04	32.96
	Reference Margin Level	15.80	15.80	15.80	15.80	15.80
MRO-Manitoba Hydro	Anticipated	15.29	18.76	17.65	24.73	33.74
	Prospective	17.85	18.85	12.30	14.64	23.72
	Reference Margin Level	12.00	12.00	12.00	12.00	12.00
MRO-SaskPower	Anticipated	17.02	26.13	29.97	27.73	21.68
	Prospective	17.02	26.13	29.97	29.76	23.74
	Reference Margin Level	11.00	11.00	11.00	11.00	11.00
NPCC-Maritimes	Anticipated	23.12	23.37	26.73	27.98	28.11
	Prospective	23.81	24.78	25.25	26.50	26.63
	Reference Margin Level	20.00	20.00	20.00	20.00	20.00
NPCC-New England	Anticipated	23.73	23.92	23.83	20.13	20.41
	Prospective	25.43	27.96	29.70	26.02	26.31
	Reference Margin Level	16.60	16.70	16.90	16.90	16.90
NPCC-New York	Anticipated	22.54	22.76	24.95	25.64	25.54
	Prospective	23.56	26.98	29.41	31.81	31.70
	Reference Margin Level	15.00	15.00	15.00	15.00	15.00
NPCC-Ontario	Anticipated	24.85	30.09	27.01	24.23	24.73
	Prospective	24.85	30.09	27.01	24.23	24.73
	Reference Margin Level	19.45	18.37	18.17	23.19	23.72
NPCC-Québec	Anticipated	17.71	16.79	15.08	16.36	15.53
	Prospective	20.77	19.83	18.10	19.35	18.49
	Reference Margin Level	12.90	12.90	12.90	12.90	12.90
PJM	Anticipated	32.47	33.43	28.01	28.89	28.85
	Prospective	38.00	46.71	52.51	58.51	60.67
	Reference Margin Level	16.70	16.60	16.60	16.60	16.60

Table 1: Planning Reserve Margin Years (2018–2022)						
Assessment Area	Reserve Margins	2018	2019	2020	2021	2022
SERC-E	Anticipated	16.53	15.22	13.67	11.99	12.76
	Prospective	16.62	15.31	13.77	12.08	12.86
	Reference Margin Level	15.00	15.00	15.00	15.00	15.00
SERC-N	Anticipated	21.45	20.31	19.93	19.40	18.92
	Prospective	24.56	23.38	22.98	22.44	21.95
	Reference Margin Level	15.00	15.00	15.00	15.00	15.00
SERC-SE	Anticipated	33.72	34.99	35.15	34.22	34.90
	Prospective	35.18	36.44	36.58	35.64	36.31
	Reference Margin Level	15.00	15.00	15.00	15.00	15.00
SPP	Anticipated	32.43	28.78	28.90	27.59	25.40
	Prospective	32.94	28.99	29.11	27.80	25.06
	Reference Margin Level	12.00	12.00	12.00	12.00	12.00
Texas RE-ERCOT	Anticipated	18.22	18.06	17.98	17.06	15.50
	Prospective	23.54	40.51	48.67	49.67	48.76
	Reference Margin Level	13.75	13.75	13.75	13.75	13.75
WECC-AB	Anticipated	21.52	21.35	18.22	15.93	13.61
	Prospective	22.16	26.43	30.29	31.17	28.55
	Reference Margin Level	11.03	11.03	11.03	11.03	11.03
WECC-BC	Anticipated	15.18	14.25	12.84	12.11	12.10
	Prospective	15.18	14.25	12.84	12.11	12.10
	Reference Margin Level	12.10	12.10	12.10	12.10	12.10
WECC-CAMX	Anticipated	19.17	20.70	20.59	22.71	18.85
	Prospective	19.17	20.70	20.59	22.71	18.85
	Reference Margin Level	16.14	16.14	16.14	16.14	16.14
WECC-NWPP-US	Anticipated	22.22	22.80	27.74	25.91	28.45
	Prospective	22.45	23.22	28.16	26.33	28.87
	Reference Margin Level	16.38	16.38	16.38	16.38	16.38
WECC-RMRG	Anticipated	23.66	26.01	25.95	22.86	21.39
	Prospective	23.30	25.38	25.40	22.32	20.86
	Reference Margin Level	14.17	14.17	14.17	14.17	14.17
WECC-SRSG	Anticipated	23.67	23.18	22.63	21.95	21.71
	Prospective	20.17	10.30	14.17	13.66	13.65
	Reference Margin Level	15.83	15.83	15.83	15.83	15.83



## MISO

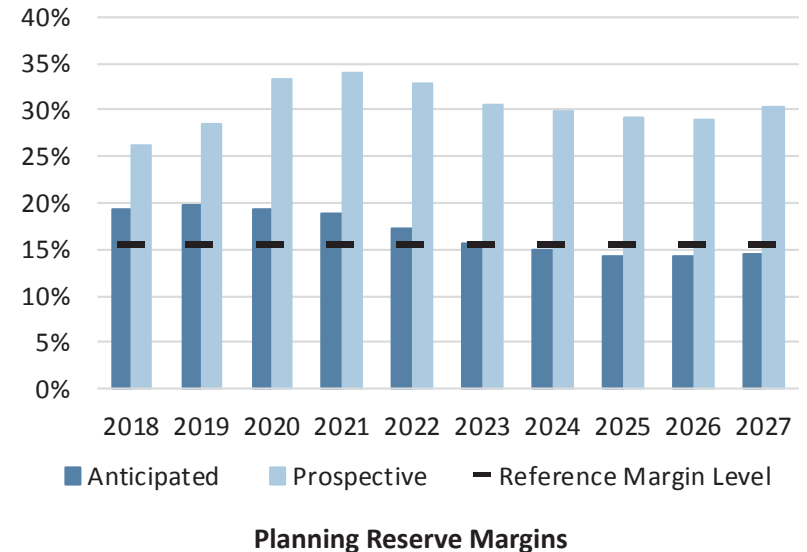
The Midcontinent Independent System Operator, Inc. (MISO) is a not-for-profit, member-based organization that administers the wholesale electricity markets that provide customers with valued service; reliable, cost-effective systems and operations; dependable and transparent prices; open access to markets; and planning for long-term efficiency. MISO manages energy, reliability, and operating reserve markets that consist of 36 local Balancing Authorities and 394 market participants, serving approximately 42 million customers. Although parts of MISO fall in three NERC Regions, MRO is responsible for coordinating data and information submitted for NERC’s reliability assessments.

## Highlights

- For 2018, MISO is projected to have 2.7 GW to 4.8 GW resources in excess of the regional requirement. Through 2022, regional surpluses and potential resources are sufficient for all zones to serve their deficits while meeting local requirements.
- Continued focus on load growth variations and generation retirements will allow transparency around future resource adequacy risk.

Demand, Resources, and Reserve Margins										
Demand (MW)	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
Total Internal Demand	125,568	126,544	127,022	127,646	128,287	128,897	129,409	129,109	128,913	128,716
Demand Response	5,621	5,621	5,621	5,621	5,621	5,621	5,621	5,621	5,621	5,621
Net Internal Demand	119,947	120,923	121,402	122,025	122,666	123,276	123,789	123,488	123,292	123,095
Resources (MW)	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
Anticipated	143,012	144,857	144,925	145,121	143,866	142,477	142,265	141,079	140,922	141,021
Prospective	151,344	155,322	161,883	163,567	163,093	160,946	160,735	159,548	158,981	160,372
Reserve Margins (%)	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
Anticipated	19.23	19.79	19.38	18.93	17.28	15.57	14.93	14.24	14.30	14.56
Prospective	26.18	28.45	33.35	34.04	32.96	30.56	29.85	29.20	28.95	30.28
Reference Margin Level	15.80	15.80	15.80	15.80	15.80	15.80	15.80	15.80	15.80	15.80

Existing On-Peak Generation (Summer)		
Generation Type	Peak Season Capacity	
	MW	Percent
Biomass	439	0.3
Coal	56,226	40.9
Hydro	1,271	0.9
Natural Gas	59,546	43.3
Nuclear	11,955	8.7
Petroleum	2,427	1.8
Pumped Storage	2,775	2.0
Solar	319	0.2
Wind	2,431	1.8



### Planning Reserve Margins

The Anticipated Reserve Margin remains above the Reference Margin Level of 15.8 percent through the summer of 2022. In 2018, MISO is projected to have 2.7 GW to 4.8 GW of resources in excess of the Planning Reserve Margin Requirement. MISO's regional surpluses and potential resources are sufficient for all zones to serve their deficits while meeting local requirements in the 2019–2022 time frame.

### Demand

MISO projects the summer coincident peak demand to grow at an average annual rate of 0.3 percent for the 10-year period, slightly less than the 2016 LTRA. Zones 4 and 7 (Lower Peninsula Michigan) have essentially flat load growth rate over the 10-year period; specifically, Zone 4 saw the largest year-over-year change within MISO. This included forecasted load reductions due to expected loss of industrial load paired with a near-flat future growth rate. These are the main drivers in the reduction of regional growth.

### Demand-Side Management

MISO forecasts 5,620 MW of direct control load management and interruptible load to be available for the assessment period. MISO also forecasts at least 4,129 MW of behind-the-meter generation to be available for the assessment period. Zone 4 and Zone 7 had a significant increase in DR for the assessment period, due to new registrations by aggregators in MISO's Module E Capacity Tracking Tool. Energy efficiency is not explicitly forecasted at MISO; any energy efficiency programs are reflected within the demand and energy forecasts.

### Distributed Energy Resources (DERs)

As part of the MISO Transmission Expansion Plan ([MTEP](#)) study, there was an attempt to collect information on DERs. The forecast provides an estimate of DER programs and their impact on peak demand and annual energy savings. This forecast positions MISO to understand emerging technologies and the role they play in transmission planning as there is a specific case on distributed energy resources both at a base case level and increased penetration level. MISO has not experienced any operational challenges as of yet but expects to as programs grow in the future.

### Generation

A total of 574 MW of generation capacity is retiring in 2017 and an additional 735 MW of generation capacity will retire in 2018. Through the generator interconnection queue (GIQ) process, MISO anticipates 4,517 MW of future firm capacity additions and uprates along with 4,106 MW of future potential capacity additions to be in-service and expected on-peak during the assessment period. This is based on a snapshot of the GIQ and the 2017 OMS-MISO Survey as of June 2017, which includes the aggregation of active projects.

### Capacity Transfers

The SPP settlement agreement has put in place a regional directional transfer limit replacing the Operations Reliability Coordination Agreement operating limit. Specifically, midwest (LRZs 1-7) to south (LRZs 8-10) flow is limited to 3,000 MWs and south to midwest is limited to 2,500 MWs. Without this regional directional transfer limit, there is roughly 3 GW in the near term that would be available to support resource adequacy in the short-term.

### Transmission

The annual MISO Transmission Expansion Plan (MTEP) proposes transmission projects to maintain a reliable electric grid and deliver the lowest-cost energy to customers in MISO. Major categories of the MTEP include the following: A total of 106 baseline reliability projects required to meet NERC Reliability Standards, 32 generator interconnection projects required to reliably connect new generation to the transmission grid, 1 market efficiency project to meet requirements for reducing market congestion, 1 transmission delivery service project that includes network upgrades driven by transmission service requests, and 243 other projects.

## CERTIFICATE OF SERVICE

I, Carl Cronin, hereby certify that I have this day served copies of the foregoing document on the attached list of persons.

xx by depositing a true and correct copy thereof, properly enveloped with postage paid in the United States mail at Minneapolis, Minnesota

xx electronic filing

**Docket No.**        **E999/M-17-377**

Dated this 3rd day of January 2018

/s/

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Carl Cronin  
Regulatory Administrator

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