

Table ZS-7: ATC System Angular Stability Assessment for 2011 10-Year Assessment (as of July 1, 2011)

	Facility Studied	# Units	Total Capacity (MW)	Last Year Of Detail Study	Response to Selected NERC Category B, C and D Contingencies (NERC Reliability Criteria)			SPS	Note	
					2011	2012-2015	2016			Appropriate for 2017-2021
<b>Existing Units</b>										
1	Pleasant Prairie	2	1208.0	2007	Acceptable (1,2,3)	Acceptable (1,2,3)	Acceptable (1,2,3)	Yes	No	See notes (4,5)
2	Paris	4	400.0	2008	Acceptable (1,2,3)	Acceptable (1,2,3)	Acceptable (1,2,3)	Yes	No	2008 TYA
3	Oak Creek	7	1138.0	2007	Acceptable (1,2,3)	Acceptable (1,2,3)	Acceptable (1,2,3)	Yes	No	See note (5)
4	Valley	2	280.0	2009	Acceptable (2,3)	Acceptable (2,3)	Acceptable (2,3)	Yes	No	2009 TYA, See note (6)
5	Germantown	5	345.0	2010	Acceptable (3)	Acceptable (3)	Acceptable (3)	Yes	No	2010 TYA, See note (7)
6	Port Washington	6	1080.0	2009	Acceptable (2,3)	Acceptable (2,3)	Acceptable (2,3)	Yes	No	2009 TYA, See note (8)
7	Point Beach	2	512; 514	2009	Acceptable (2,3)	Acceptable (2,3)	Acceptable (2,3)	Yes	Yes	See note (9)
8	Kewaunee	1	579.0	2009	Acceptable (2,3)	Acceptable (2,3)	Acceptable (2,3)	Yes	No	2009 TYA
9	Edgewater	3	773.0	2010	Acceptable (3)	Acceptable (3)	Acceptable (3)	Yes	Yes	2010 TYA, See note (10)
10	S. Fond du Lac	4	352.0	2010	Acceptable (3)	Acceptable (3)	Acceptable (3)	Yes	No	2010 TYA
11	Neevin	2	300.0	2005	Acceptable (20)	Acceptable (20)	Acceptable (20)	Yes	No	2011 TYA
12	De Pere	1	185.0	2010	Acceptable (3)	Acceptable (3)	Acceptable (3)	Yes	No	2010 TYA, See note (11)
13	Pulliam	6	459.0	2005	Acceptable (20)	Acceptable (20)	Acceptable (20)	Yes	No	2011 TYA
14	West Marinette	4	240.0	2009	Acceptable (2,3)	Acceptable (2,3)	Acceptable (2,3)	Yes	No	2009 TYA
15	Fox Energy	3	672.3	2008	Acceptable (1,2,3)	Acceptable (1,2,3)	Acceptable (1,2,3)	Yes	No	2008 TYA, See note (9)
16	Sheboygan Energy	2	343.0	2005	Acceptable (20)	Acceptable (20)	Acceptable (20)	Yes	No	2011 TYA, See note (9)
17	Cypress	88	145.2	2009	Acceptable (2,3)	Acceptable (2,3)	Acceptable (2,3)	Yes	No	2009 TYA
18	Forward Energy Center	86	129.0	2008	Acceptable (1,2,3)	Acceptable (1,2,3)	Acceptable (1,2,3)	Yes	No	2008 TYA
19	Columbia	2	1050.0	2005	Acceptable (18)	Acceptable (18)	Acceptable (18)	Yes	No	2011 TYA
20	Christiana	3	544.5	2005	Acceptable (19)	Acceptable (19)	Acceptable (19)	Yes	No	2011 TYA
21	Riverside	3	659.1	2010	Acceptable (3)	Acceptable (3)	Acceptable (3)	Yes	No	2010 TYA
22	Rock River	5	132.0	2010	Acceptable (3)	Acceptable (3)	Acceptable (3)	Yes	No	2010 TYA
23	Nelson Dewey	2	226.0	2010	Acceptable (1,2,3)	Acceptable (1,2,3)	Acceptable (1,2,3)	Yes	No	See note (12)
24	University	2	236.0	2008	Acceptable (1,2,3)	Acceptable (1,2,3)	Acceptable (1,2,3)	Yes	No	2008 TYA
25	Concord	4	400.0	2008	Acceptable (1,2,3)	Acceptable (1,2,3)	Acceptable (1,2,3)	Yes	No	2008 TYA
26	West Campus	3	147.2	2009	Acceptable (2,3)	Acceptable (2,3)	Acceptable (2,3)	Yes	No	2009 TYA
27	Presque Isle	5	431.0	2007	Acceptable (2,3)	Acceptable (2,3)	Acceptable (2,3)	Yes	Yes	See note (13)
28	Weston	5	552.6	2005	Acceptable (20)	Acceptable (20)	Acceptable (20)	Yes	No	2011 TYA
26	Elm Road	1	1230.0	2007	Acceptable (1,2,3)	Acceptable (1,2,3)	Acceptable (1,2,3)	Yes	No	See note (5)
<b>New / Future Units with Signed Interconnection Agreement</b>										
27	EcoMet (wind)	67	100.5	2008	See note (17)	See note (17)	See note (17)	See note (17)	No	See note (14)
22	Glacier Hills (wind)	138	249.0	2009	See note (15)	See note (15)	See note (15)	See note (15)	No	See note (15)
23	Lake Breeze	49	98.0	2004	See note (17)	See note (17)	See note (17)	See note (17)	No	See note (16)

These shaded rows represent units at plants in which there have been a significant system topological change near the plant or significant parameter changes or updates to the dynamic models used in stability studies and are to be studied in the 2011 TYA as part the system angular stability analysis

Notes:

- Comparing 2009 TYA models with 2008 TYA models, no significant change has occurred near the generation station, other than the local load growth. Therefore, the stability results from the 2008 TYA are still applicable and are acceptable in the following years.
- Comparing 2010 TYA models with 2009 TYA models, no significant change has occurred near the generation station, other than the local load growth. Therefore, the stability results from the 2009 TYA are still applicable and are acceptable in the following years.
- Comparing 2011 TYA models with 2010 TYA models, no significant change has occurred near the generation station, other than the local load growth. Therefore, the stability results from the 2010 TYA are still applicable and are acceptable in the following years.
- Since 2009 TYA Pleasant Prairie Special Protection System (SPS) study was completed on May 27, 2009 and concluded the SPS was no longer required and could be retired.
- "Final Facility Study Update – Revision 2 Phase I, II & III Milwaukee County, Wisconsin MISO #G051 (#36760-01)" dated January 15, 2007.
- Replacement of breaker failure relays and breakers required per 2009 TYA.
- Addition of redundant bus differential relays and reduction of delayed clearing times required per 2010 TYA.
- 2009 TYA Evaluation, Generator Validation Study dated September 8, 2008. River Bend D-T Study Dated December 2010 covers any changes in the local area.
- "Final ISIS Report Point Beach Generators Manitowoc County, Wisconsin MISO #G833/J022 (#39297-01), G834/J023 (#39297-02)" dated October 2, 2009. A single NERC Category C9 was evaluated to ensure full compliance with applicable NERC standards.
- Addition of redundant bus differential relays required per 2010 TYA.
- Addition of redundant bus differential relays and reduction of delayed clearing times required per 2010 TYA.
- "Interconnection System Impact Study Report 50 MW Wind Generation Grant County, Wisconsin J084" dated June 24, 2010
- "Presque Isle Special Protection System "Remedial Action Tripping Scheme" (RATS)" Version 3.0 dated December 17, 2007. Presque Isle will be re-studied as part of the next SPS review.

Notes (Continued):

- (14) "Interconnection System Impact Study Report 99 MW Wind Generation Revision 4; Calumet County, Wisconsin" - MISO #G611 (#38791-01)" dated October 24, 2008.  
"Interconnection System Impact Study Report 1.5 MW Wind Generation; Calumet County, Wisconsin" - MISO #G927 (#39423-01)" dated May 16, 2008.
- (15) "Interconnection System Impact Study Report 99 MW Wind Generation Revision 3; Columbia County, Wisconsin" - MISO #G706 (#39041-01)" dated September 4, 2008.  
"Interconnection System Impact Study Report 150 MW Wind Generation Revision 2; Columbia County, Wisconsin" - MISO #H012 (#39567-01)" dated July 13, 2009.  
Glacier Hills will be commercial by the end of 2011 and will be put into the rotation of studied generators beginning with the 2012 TYA study.
- (16) "Interconnection Evaluation Study Report 98 MW Wind Generation; Fond du Lac County, Wisconsin" - MISO #G427 (#38121-01)" dated December 22, 2004.
- (17) Until a generator declares commercial operation, an assessment of this facility will not be completed as part of the current Ten Year Assessment.
- (18) Two NERC Category D3 contingencies resulted in un-acceptable performance for ATC post-contingency voltage recovery criteria. Re-setting breaker failure relays for these contingencies result in meeting applicable ATC planning criteria. No angular instability was identified for these contingencies. All applicable NERC planning criteria was met for these contingencies.
- (19) Nine NERC Category D2 and three NERC Category D3 contingencies resulted in un-acceptable performance for ATC stability and post-contingency voltage recovery criteria. Re-setting breaker failure relays for the category D2 and D3 contingencies result in meeting applicable ATC criteria. All applicable NERC planning criteria was met for these contingencies.
- (20) No angular or voltage stability concerns were identified for this generator for the 2011 TYA.