



Zone 1 Updated Study Results

Refer to Table PR-22 Summary of Changes in this Update.

Cancelled projects

Rebuild/reconductor Petenwell-Saratoga 138-kV line

This project was cancelled due to recent updated study results, but may be a candidate for future economic benefits analysis.

Deferred projects

Construct Brandon-Fairwater 69-kV line

This project was proposed in response to a request from Alliant Energy for a new distribution interconnection near the community of Fairwater. Alliant Energy recently submitted a T-D interconnection change form to defer the in-service date of this interconnection request from 2008 to 2010.

Construct a 69-kV line from SW Ripon to the Ripon-Metomen 69-kV line

This project was proposed in response to a request from Alliant Energy for a new distribution interconnection near the community of Ripon. Alliant Energy recently submitted a T-D interconnection change form to defer the in-service date of this interconnection request from 2012 to 2013.

Construct Monroe County-Council Creek 161-kV line

Install a 161/138-kV transformer at Council Creek Substation

Uprate Council Creek-Petenwell 138-kV line

Several potential projects have been evaluated to address the system need for periodic separation of the ATC-Dairyland Power Cooperative facilities at the Council Creek Substation. They include a phase-shifting transformer, series reactor, capacitor banks, operating guides, or a combination. To address the near-term pre- and post- contingency issues, capacitor banks were installed on the Council Creek 138-kV bus in 2006 in combination with the continued use of the Council Creek operation guide. We are currently working in cooperation with Dairyland Power Cooperative and Xcel Energy to develop a more comprehensive long-term solution to address reliability issues in the Tomah area as well as the limitations of the Monroe County-Council Creek transmission corridor. The proposed solution will be to replace the existing 69-kV circuit between the Monroe County and Council Creek Substations with a new 161/69-kV double-circuit line in 2012. This project has been deferred from 2010 to allow time to finalize need, obtain regulatory approval and implement the approved project.



10-Year Assessment

An annual report summarizing proposed additions and expansions to the transmission system to ensure electric system reliability.

2007

November 2007 10-Year Assessment
www.atc10yearplan.com

Other project changes

Berlin capacitor banks (2008):

Since the release of the 2006 10-Year Assessment, ATC has continued to assess the reactive power requirements for the Berlin area in an effort to optimize the size and location of the capacitor banks. The recently completed studies indicated the following capacitor installations as the configuration providing the most system benefits with the overall lowest estimated project costs:

- Upgrade existing 4.1 MVAR capacitor bank at Berlin to 8.2 MVAR
- Upgrade existing 5.4 MVAR capacitor bank at Berlin to 10.8 MVAR

Gardner Park-Hwy 22 345-kV line (2009):

The previously named Central Wisconsin Substation has been renamed Hwy 22.

New projects

None

For a graphical depiction of projects in Zone 1, please refer to [Figure PR-1](#).

*Table PR-13
Transmission System Additions for Zone 1*

System additions	System need year	Projected in-service year	Planning zone	Need category	Planned, Proposed or Provisional
Construct Stone Lake-Arrowhead 345-kV line	1997	2008	1	service limitation, reliability, import capability & Weston stability	Planned
Construct the new permanent Stone Lake 345/161-kV Substation	2008	2008	1	reliability, import capability & Weston stability	Planned
Install 1-75 MVAR capacitor bank and 1-45 MVAR inductor at Stone Lake 345 kV	2008	2008	1	achieve transfer capability associated with Arrowhead-Gardner Park	Planned
Construct new Arrowhead 345-kV Substation, install 2-75 MVAR capacitor banks, 1-800 MVA PST and 1-800 MVA 345/230-kV transformer	2008	2008	1	achieve transfer capability associated with Arrowhead-Gardner Park	Planned
Construct Cranberry-Conover 115-kV line	2008	2008	1	reliability, transfer capability	Planned
Upgrade 4.1 MVAR capacitor bank to 8.2 MVAR and upgrade the 5.4 MVAR capacitor bank to 10.8 MVAR at Berlin 69-kV Substation	2008	2008	1	reliability	Planned
Construct Gardner Park-Hwy 22 345-kV line	2009	2009	1	service limitation, reliability, import capability and Weston stability	Planned
Construct new Hwy 22 345-kV Substation	2009	2009	1	service limitation, reliability, import capability and Weston stability	Planned
Replace 138/69-kV transformer at Metomen Substation	2010	2010	1	reliability	Provisional
Construct Brandon-Fairwater 69-kV line	2010	2010	1	T-D interconnection	Proposed
Upgrade 4.1 MVAR capacitor bank to 8.2 MVAR and install a new 8.2 MVAR capacitor bank at Ripon 69-kV Substation	2011	2011	1	reliability	Provisional
Construct Monroe County-Council Creek 161-kV line	2012	2012	1	access initiative, reliability	Provisional
Install a 161/138-kV transformer at Council Creek Substation	2012	2012	1	access initiative, reliability	Provisional
Upgrade Council Creek-Petenwell 138-kV line	2012	2012	1	access initiative, reliability	Provisional
Upgrade Gardner Park-Black Brook 115-kV line - scope TBD	2012	2012	1	reliability	Provisional
Upgrade Mckenna 6.3 MVAR capacitor bank to 10.8 MVAR and install a second new 10.8 MVAR capacitor bank	2013	2013	1	reliability	Provisional

*Table PR-13
Transmission System Additions for Zone 1 (continued)*

System additions	System need year	Projected in-service year	Planning zone	Need category	Planned, Proposed or Provisional
Construct a 69-kV line from SW Ripon to the Ripon-Metomen 69-kV line	2013	2013	1	T-D interconnection	Provisional
Construct Fairwater-Mackford Prairie 69-kV line	2014	2014	1	reliability	Provisional
Reconfigure the North Randolph-Ripon 69-kV line to form a second Ripon-Metomen 69-kV line and retire the circuit between Metomen and the Mackford Prairie tap	2014	2014	1	reliability	Provisional
Install a second 138/69-kV transformer at Wautoma Substation	2015	2015	1	reliability	Provisional
Install a 12.2 MVAR capacitor bank at Hilltop 69-kV Substation	2016	2016	1	reliability	Provisional

Table PR-22**Summary of Cancellations, Deferrals, Changes, Possible Changes and New Projects for the 2007 10-Year Assessment**

PROJECTS CANCELLED	Former In-Service Date	Planning Zone	Reason for Removal
Rebuild/reconductor Petenwell-Saratoga 138-kV line	2010	1	Updated study results
Uprate M38 138/69-kV transformer	TBD	2	Revised load/model information
Install 1-5.4 MVAR capacitor bank at Sawyer 69 kV	TBD	2	Replaced with distribution capacitor bank solution
Construct Huiskamp-Blount 138-kV line	2012	3	Further studies needed to determine scope and in-service date
Uprate North Monroe-Idle Hour 69-kV line	2012	3	Updated study results
Install series reactor at Cornell Substation	2007	5	Updated study results
Expand Oak Creek 345-kV switchyard to interconnect three new generators plus one new 345-kV line and 138-kV switchyard to accommodate new St. Martins line	2013	5	Elm Road generation Phase 3 cancellation
Construct a 345/138-kV switchyard at Hale (Brookdale) to accommodate two 345-kV lines, a 500 MVA 345/138-kV transformer and 4-138-kV lines plus three 138-26.2 kV transformers	2013	5	Elm Road generation Phase 3 cancellation
Install two 345-kV line terminations at Pleasant Prairie Substation and loop Zion-Arcadian 345-kV line into Pleasant Prairie	2013	5	Elm Road generation Phase 3 cancellation
Construct an Oak Creek-Hale (Brookdale) 345-kV line installing 4 mi. new structures, converting 16.2 mi. of non-operative 230 kV and 5 mi. 138 kV	2013	5	Elm Road generation Phase 3 cancellation
Construct Oak Creek-St. Martins 138-kV circuit #2 installing 16.6 mi. conductor on existing towers	2013	5	Elm Road generation Phase 3 cancellation
Construct a Hale (Brookdale)-Granville 345-kV line converting/reconductoring 5.6 mi. 138 kV, rebuilding 7 mi. 138 kV double circuit tower line and converting/reconductoring 3 mi. 138 kV on existing 345-kV structures	2013	5	Elm Road generation Phase 3 cancellation
Reconductor Cornell-Range Line 138-kV line	2014	5	Updated study results

Table PR-22 (continued)**Summary of Cancellations, Deferrals, Changes, Possible Changes and New Projects for the 2007 10-Year Assessment**

PROJECTS DEFERRED	New date	Planning Zone	Reason for Deferral
Construct a 345-kV substation at new Cypress; loop existing Forest Junction-Arcadian line into new Cypress Substation	2007	4	Was 2006; revised construction schedule
Construct new line from Southwest Delavan to Bristol at 138 kV and operate at 69 kV	2008	3	Was 2007; revised construction schedule
Construct North Madison-Huiskamp 138-kV line	2009	3	Was 2008; revised construction schedule
Install 1-4.08 MVAR capacitor bank at L'Anse 69 kV	2009	2	Was 1-5.4 MVAR bank in 2008; revised construction schedule
Relocate Cedar Substation (North Lake)	2009	2	Was 2008; deferred due to resource availability
Install second 345/138-kV transformer at Plains Substation	2009	2	Was 2008; revised load/model information
Construct a Jefferson-Lake Mills-Stony Brook 138-kV line	2009	3	Was 2008; deferred due to route contention
Uprate Rockdale to Jefferson 138-kV line	2009	3	Was 2008; deferred because route contention
Uprate Rockdale to Boxelder 138-kV line	2009	3	Was 2008; deferred because of route contention
Uprate Boxelder to Stonybrook 138-kV line	2009	3	Was 2008; deferred because of route contention
Rebuild Crivitz-High Falls 69-kV double circuit line	2009	4	Was 2008; resource availability
Construct Brandon-Fairwater 69-kV line	2010	1	Was 2008; customer's decision to defer
Rebuild/convert Conover-Plains 69-kV line to 138 kV, construct 138-kV bus and install transformers at Iron Grove and Aspen, and relocate Iron River Substation (Iron Grove)	2009	2	Was 2008; deferred due to regulatory delays
Construct new Oak Ridge-Verona 138-kV line and install a 138/69-kV transformer at Verona	2010	3	Was 2009; regulatory delay
Rebuild the Verona to Oregon 69-kV line Y119	2011	3	Was 2008; route overlap complications and associated regulatory delay for portion from Verona to Sun Valley (due to Oak Ridge to Verona delay) and Rockdale to West Middleton overlap for entire route
Install 200 MVAR capacitor bank at Bluemound Substation	2010	5	Was 2008; detailed study in progress to determine scope and in-service date

Table PR-22 (continued)**Summary of Cancellations, Deferrals, Changes, Possible Changes and New Projects for the 2007 10-Year Assessment**

PROJECTS DEFERRED (continued)	New date	Planning Zone	Reason for Deferral
Rebuild Brodhead to South Monroe 69-kV line	2011	3	Was 2008; updated study results and resource availability
Construct Monroe County-Council Creek 161-kV line	2012	1	Was 2010; resource availability
Install a 161/138-kV transformer at Council Creek Substation	2012	1	Was 2010; resource availability
Uprate Council Creek-Petenwell 138-kV line	2012	1	Was 2010; resource availability
Construct a 69-kV line from SW Ripon to the Ripon-Metomen 69-kV line	2013	1	Was 2012; customer's decision to defer
Rebuild Blaney Park-Munising 69 kV to 138 kV	2013	2	Was 2012; Asset Management review
Construct 345-kV line from Rockdale to West Middleton	2013	3	Was 2011; updated study results
Construct a 345-kV bus and install a 345/138 kV 500 MVA transformer at West Middleton Substation	2013	3	Was 2011; updated study results
Uprate Columbia 345/138-kV transformer T-22 to 527 MVA	2013	3	Was 2008; revised rating information
Loop Nine Springs-Pflaum 69-kV line into Femrite Substation	2013	3	Was 2010; delayed due to resource availability
Install a 138/69-kV transformer at Bass Creek Substation	2013	3	Was 2010; delayed due to resource availability
Rebuild/reconductor Town Line Road-Bass Creek 138-kV line	2013	3	Was 2010; delayed due to resource availability
Replace the existing 46 MVA Hillman 138/69-kV transformer with a 100 MVA transformer	2013	3	Was second transformer in 2010; updated study results
Loop the Deforest to Token Creek 69-kV line into the Yahara River Substation and install 138/69-kV transformer at Yahara River	2014	3	Was 2011; delayed due to updated study results
Uprate Yahara River-Token Creek 69-kV line	2014	3	Was 2011; delayed due to updated study results
Install 138/69-kV transformer at Custer Substation	2014	4	Was 2012; updated study results
Construct Shoto to Custer 138-kV line	2014	4	Was 2012; updated study results
Construct a 345-kV bus at Bain Substation	2014	5	Was 2009; further study needed to determine scope and in-service date

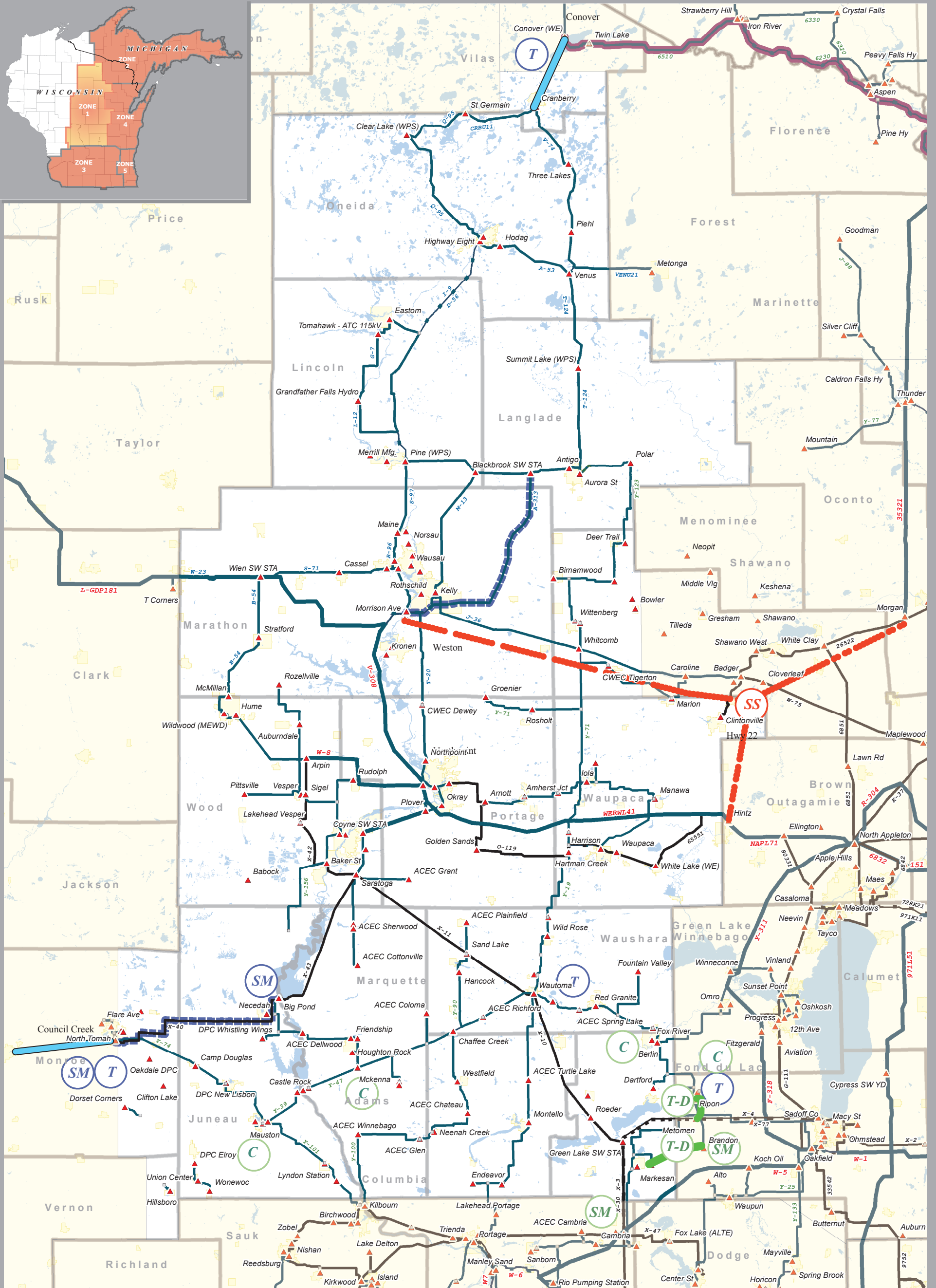
Table PR-22 (continued)**Summary of Cancellations, Deferrals, Changes, Possible Changes and New Projects for the 2007 10-Year Assessment**

OTHER PROJECT CHANGES AND POSSIBLE CHANGES	Date	Planning Zone	Nature of Change or Update
Upgrade 4.1 MVAR capacitor bank to 8.2 MVAR and upgrade the 5.4 MVAR capacitor bank to 10.8 MVAR at Berlin 69-kV Substation	2008	1	Was total of 12.8 MVAR upgrade
Install 1-4.08 MVAR capacitor bank at Roberts 69-kV Substation	2008	2	Was 5.4 MVAR capacitor bank
Install 2-4.08 MVAR capacitor banks at Munising 69-kV Substation	2008	2	Was 2-5.4 MVAR banks
Install 2-8.16 MVAR 69-kV capacitor bank at South Lake Geneva Substation	2008	3	Was 1-16.33 MVAR bank
Expand the Menominee 69-kV Substation and install 138 kV terminals. Loop the West Marinette-Bay De Noc 138-kV line into the Substation	2008	4	Was provisional, now proposed
Install 138/69-kV transformer at the expanded Menominee Substation	2008	4	Was provisional, now proposed
Install 2-1.2 MVAR distribution capacitor banks at Sister Bay 69 kV	2008	4	Was 2-4.1 MVAR banks on transmission side, was provisional and now is proposed
Construct Gardner Park-Hwy 22 345-kV line	2009	1	Central Wisconsin was renamed Hwy 22
Construct new Hwy 22 345-kV Substation	2009	1	Central Wisconsin was renamed Hwy 22
Uprate Chandler-Cornell 69-kV line clearance from 120 to 167 deg F	2009	2	Was provisional in 2010; now proposed in 2009
Install 3-16.33 MVAR 138-kV capacitor banks at North Beaver Dam Substation	2009	3	Was provisional, now proposed; was 2-24.5 MVAR banks
Install 2-24.5 MVAR 138 kV capacitor banks at Kilbourn Substation and install 2-24.5 MVAR 138-kV capacitor banks at Artesian Substation	2009	3	Was 2-16.33 capacitor banks at Kilbourn and 2-24.5 at Artesian
Expand the existing 69-kV capacitor bank from 5.4 to 8.1 MVAR at Richland Center Olson Substation and install 1-7.8 MVAR 12.4-kV capacitor bank at Brewer Substation	2009	3	Was 2-8.16 MVAR banks at Brewer
Construct second Paddock-Rockdale 345-kV line and replace 345/138-kV transformer T22 at Rockdale Substation	2010	3	Added the transformer replacement
Upgrade the existing 2-8.16 MVAR to 2-16.33 MVAR capacitor banks at South Lake Geneva Substation	2010	3	Was second 16.33 MVAR bank
Construct new Mackinac 138/69-kV Substation	TBD	2	Was Proposed in 2011, now Provisional and TBD
Rebuild Hiawatha-Pine River 69-kV line ESE_6908	TBD	2	Was Proposed in 2009; now Provisional and TBD
Construct West Middleton-North Madison 345-kV line	TBD	3	Was proposed in 2016; now Provisional and TBD

Table PR-22 (continued)**Summary of Cancellations, Deferrals, Changes, Possible Changes and New Projects for the 2007 10-Year Assessment**

NEW PROJECTS	In-Service Date	Planning Zone	Reason for Project
Relocate Mishicot 138-kV Substation	2007	4	new generation
Upgrade St. Martins 138-kV bus to 2000A	2007	5	reliability
Upgrade St. Lawrence 138-kV bus	2007	5	reliability
Construct ring bus at the Pine River 69-kV Substation and replace 1-5.4 MVAR capacitor bank with 2-4.08 MVAR banks	2008	2	reliability
Uprate Empire-Forsyth 138-kV line to 302 MVA	2008	2	reliability
Uprate Portage 138/69-kV transformer to 143 MVA	2008	3	reliability
Uprate X-17 Eden-Spring Green 138-kV line to 167 degrees F	2008	3	reliability
Install temporary 24.5 MVAR capacitor bank at Boxelder 138-kV Substation	2008	3	reliability; Jefferson-Stony Brook project delay
Construct a 138-kV substation at new Cedar Ridge; loop existing Ohmstead-Kettle Moraine 138-kV line into new Cedar Ridge Substation	2008	4	accommodate new generation
Install 2-16.32 MVAR capacitor bank at Perkins 138-kV Substation	2009	2	reliability
Install 1-16.33 MVAR capacitor bank at Hiawatha 138-kV Substation	2009	2	reliability
Install 12.45 MVAR 69-kV mobile capacitor bank at Brick Church Substation	2009	3	reliability
Install 2-32 Mvar capacitor banks at Mukwonago 138-kV Substation	2009	5	reliability
Install 2-4.08 MVAR capacitor banks at the 9 Mile 69-kV Substation	2010	2	reliability
Install 1-16.33 MVAR capacitor bank at Indian Lake 138-kV Substation	2010	2	reliability
Replace two overhead Blount-Ruskin 69-kV lines with one underground 69-kV line	TBD	3	negotiated agreement with Madison
Install 2-32 MVAR capacitor banks at Summit 138-kV Substation	2010	5	reliability
Uprate Arcadian-Waukesha 138-kV lines KK9942/KK9962	2010	5	reliability

Figure PR-1



Transmission System Additions (May be Planned, Proposed or Provisional)

PLANNING ZONE 1



- (SS)** New Substation
- (SM)** Substation Modifications
- (T)** Transformer
- (C)** Capacitor Bank
- (T-D)** New T-D Interconnection

- 345 kV Transmission Line
- ▬▬▬ 115 or 138 kV Transmission Line
- ▬▬▬ Rebuilt 115 or 138 kV Transmission Line
- ▬▬▬ Transmission Line Voltage Conversion
- ▬▬▬ 69 kV Transmission Line

- Transmission Related Facilities**
- ▲ Substation, Switchyard or Terminal
 - Proposed/Design/Construction
 - ATC Office Location
 - Generation
 - Other Facility

The information presented in this map document is advisory and is intended for reference purposes only. American Transmission Company owned and operated facility locations are approximate.