October 2009 10-Year Assessment
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NERC Compliance

ATC was fully compliant with the North American Electric Reliability Council (NERC) Reliability Standards in 2008. In 2009 we continue to be committed to maintaining fully compliant status with all of the existing and newly approved NERC standard requirements.

As noted in previous Assessments, ATC is registered with two of the regional reliability compliance entities, the Midwest Reliability Organization (MRO) and the Reliability*First* Corporation (RFC). This dual reporting arrangement was established because ATC serves customers that are members in each of these Regional Reliability Organizations.

The new mandatory NERC Reliability Standards assign accountability for specific requirements based on defined entity functions. ATC registered as the following entities - Transmission Owner, Transmission Operator, Transmission Planner and Planning Authority[1]. The following discussion of NERC compliance in this document will focus on ATC's Transmission Planner accountabilities. One purpose of this section is to enhance our ability to provide documentation of ATC compliance with the Transmission Planner accountabilities.

The primary Transmission Planner compliance responsibilities are system performance assessments and system modeling. The system performance assessment standards include checking for exceeded voltage criteria limits, system equipment overloads, adequate stability, cascading outages, loss of load, and firm transfer curtailments under a wide range of system operating conditions.

The Transmission Planning reliability standards call for the consideration of thirty (30) operating conditions. These conditions are grouped into four (4) categories. The requirements associated with each of the applicable categories are contained in four separate NERC Transmission Planning standards:

A. Normal conditions (Standard TPL-001-0)
B. Single element contingencies (Standard TPL-002-0)
C. Multiple element contingencies (Standard TPL-003-0)
D. Extreme events (Standard TPL-004-0)

ATC has performed assessments annually (from 2001 to 2009), which demonstrated that its portion of the bulk electric system is planned to supply the projected LDC load and firm transmission service for the contingency conditions given in the four applicable NERC Transmission Planning standards. In addition, ATC has performed studies and simulations annually (from 2001 to 2009) that support the 2009 Assessment using the projected LDC load and firm transmission service for the contingency conditions given in the four applicable NERC Transmission Planning standards.

Studies and analyses were performed for the appropriate Category B, Category C, and Category D contingencies. The Category B contingencies that would produce the more severe system results or impacts are described in the TPL-002 Rationale. The Category C contingencies that would produce the more severe system results or impacts are described in the TPL-003 Rationale. The

[1] NERC has since replaced the Planning Authority function with Planning Coordinator.

Category D contingencies that would produce the more severe system results or impacts are described in the TPL-004 Rationale.

All of the identified compliance requirements of TPL-001-0, TPL-002-0, TPL-003-0, and TPL-004-0 of the near term (2010 to 2014) Assessment were addressed by the new five-year projects and/or operating procedures that could support our plans to comply with these standards. All of the identified compliance requirements of TPL-001-0, TPL-002-0, and TPL-003-0 of the long term (2015 to 2019) Assessment were addressed by the new 10-year projects and/or operating procedures that could support our plans to comply with these standards

All existing and planned protection systems, including any backup or redundant systems that would be applicable to a given contingency were simulated in studies and analyses. All existing and planned control devices that would be applicable to a given contingency were simulated in studies and analyses. These control devices include transformer automatic tap changers, capacitor bank automatic controls, and six DSMES units. No specific facility outages are scheduled for the planning horizon at the demand levels that were studied. As the future unfolds and facility outages are scheduled, they will be scheduled for conditions that provide acceptable reliability.

The first set of requirements (R1) in each of these standards deals with the frequency, timeframes, simulations, and conditions of the transmission system assessments. Most of the R1 requirements are met by documentation in this 10-Year Assessment (see references below).

Some R1 requirements are met by a combination of this 10-Year Assessment and the documentation in earlier Assessments. For example, the assessments in the 2009 10-Year Assessment are supported by both the system-wide simulations that were used in this Assessment and project-specific simulations that were performed for earlier assessments. Together these supporting simulations were used to revise the assessment of expected system performance in the near-term (1- to 5-year) planning horizon and other system performance in the long-term (6- to 10-year) planning horizon.

The second set of requirements (R2) in each of the four standards deals with the plans that are proposed to achieve the required system performance. Most of the project plans that were noted in the 2008 Assessment remain unchanged in light of the newer assessments. However, the 2009 10-Year Assessment describes project scope and need date changes that are required to achieve compliance based on the latest assessments.

The third set of requirements (R3) in each of the four standards covers documenting and communicating the Assessment and project plans to the MRO and RFC. Taken together, the 2008 Assessment and earlier Assessments fulfill this requirement.

The listing of potential bulk power system reinforcements to address identified near-term and long-term planning horizon needs are provided in Tables PR-2 through PR-23.

Information regarding studies that are specific to generation interconnection requests is described in the Generation interconnections section. Any publicly available generation interconnection

request details and completed study reports can be accessed through the MISO Web site at **http://oasis.midwestiso.org/documents/ATC/Cluster_8_Queue.html**

Compliance Documentation in the 2009 10-Year Assessment

The power system models are derived from cases that were provided by the Multi- Modeling Working Group (MMWG), which prepares cases for industry-wide use. Details regarding the specific system conditions and models that were used in the assessment are given in the Methodology & assumptions section. Additional explanations of the modeling methods and the frequency of system model updating are given in the Model building criteria section of the Planning criteria section.

A complete listing of the planning criteria that we apply, including those which are beyond the NERC, MRO, and RFC planning criteria, can be found in the Planning criteria section.

The system performance assessments for Category A (normal) and Category B (single element contingencies) conditions are given in the Introduction and Reactive power analysis section.

The system performance assessments for Category C (multiple element contingencies) and Category D (extreme event) conditions are contained in the Multiple outage analysis and Reactive power analysis sections.

The compliance requirements dealing with system stability, generator stability, and voltage stability for all four Category (A, B, C, and D) conditions are dealt with in the System stability, Generator stability, and Voltage stability sections.

Descriptions of the system performance studies that are prepared jointly with other interconnection companies, regional groups, or government bodies are given in the Regional analysis section.

ATC's 2009 Assessment of Transmission System Performance
Given the full set of simulations ATC completed for the 2009 Assessment and earlier assessments, ATC assesses its system as being compliant with NERC Standards TPL-001, 2, 3, and 4 for each year 2010 through 2014 and for the rest of the 10-year planning horizon.

Table PR-2
Transmission System Additions for 2009

System Additions	System Need Year	Projected In-Service Year	Planning Zone	Need Category	Planned, Proposed or Provisional	Cost Estimate - Refer to *Funding Project* and *Sum of Total (2009-2018)* in Financial Table
Uprate the Chandler-Masonville 69-kV line summer normal and emergency ratings from 120 deg F to 167 deg F	2009	2009	2	reliability	Proposed	F2532
Install 1-4.08 MVAR capacitor bank at L'Anse 69 kV	2008	2009	2	reliability	Proposed	F1819
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	2009	2	reliability, condition	Proposed	F1282
Install 1-8.16 MVAR capacitor banks at the M38 138-kV Substation	2009	2009	2	reliability	Proposed	F2485
Uprate Chandler-Cornell 69-kV line clearance from 120 to 167 deg F	2009	2009	2	reliability	Proposed	F2016
Install 1-8.2 MVAR capacitor bank at Hiawatha 138-kV Substation	2009	2009	2	reliability	Proposed	F2222
Install 1-4.08 MVAR capacitor banks at Osceola 69 kV	2009	2009	2	reliability	Proposed	F2468
Uprate the Chandler-Delta #1 69-kV line summer emergency rating from 120 deg F to 167 deg F	2009	2009	2	reliability	Proposed	F2534

Table PR-2
Transmission System Additions for 2009 (continued)

System Additions	System Need Year	Projected In-Service Year	Planning Zone	Need Category	Planned, Proposed or Provisional	Cost Estimate - Refer to *Funding Project* and *Sum of Total (2009-2018)* in Financial Table
Uprate the Chandler-Delta #2 69-kV line summer emergency rating to from 120 deg F 167 deg F	2009	2009	2	reliability	Proposed	F2535
Construct a Jefferson-Tyranena-Stony Brook 138-kV line	2006	2009	3	reliability	Planned	F0924
Uprate X-8 Rockdale to Boxelder 138-kV line	2008	2009	3	reliability	Planned	F0924
Uprate Y-41 Walworth- North Lake Geneva 69-kV to achieve a 69 MVA summer emergency rating	2009	2009	3	reliability	Planned	F2154
Install a second 138-kV reserve auxiliary transformer (RAT) at Kewaunee and remove tertiary auxiliary transformer (TAT)	2009	2009	4	reliability	Proposed	F2371

Defined in Previous 10-Year Assessment
Revised in scope from Previous 10-Year Assessment
New to this 10-Year Assessment

Table PR-3
Transmission System Additions for 2010

System Additions	System Need Year	Projected In-Service Year	Planning Zone	Need Category	Planned, Proposed or Provisional	Cost Estimate - Refer to *Funding Project* and *Sum of Total (2009-2018)* in Financial Table
Rebuild Arpin-Rocky Run 345-kV line	2010	2010	1	condition	Planned	F2252
Construct 69-kV line from new Warrens Substation to the Council Creek-Tunnel City 69-kV line	2010	2010	1	T-D interconnection	Planned	F2173
Construct Brandon-Fairwater 69-kV line	2010	2010	1	T-D interconnection	Planned	F1844
Replace Metomen 69-kV breaker	2010	2010	1	reliability, condition	Planned	F2398
Rebuild/convert Conover-Plains 69-kV line to 138 kV	2010	2010	2	reliability, transfer capability	Planned	F1363
Construct 138-kV bus and install a 138/69-kV, 60 MVA transformer at Aspen Substation	2010	2010	2	reliability	Planned	F1363
Install 1-16.33 MVAR capacitor bank at Indian Lake 138-kV Substation	2010	2010	2	reliability	Proposed	F2223
Uprate Y-61 McCue-Lamar 69-kV line to achieve 300 deg F line ratings and install 2-12.45 MVAR 69-kV capacitor banks at Lamar Substation	2008	2010	3	reliability	Proposed	F2324
Uprate X-23 Colley Road-Marine 138-kV line terminals*	2014	2010	3	reliability	Proposed	F1670
Construct new Oak Ridge-Verona 138-kV line and install a 138/69-kV transformer at Verona with a 100 MVA summer normal rating	2009	2010	3	reliability	Planned	F1407

Table PR-3
Transmission System Additions for 2010 (continued)

System Additions	System Need Year	Projected In-Service Year	Planning Zone	Need Category	Planned, Proposed or Provisional	Cost Estimate - Refer to *Funding Project* and *Sum of Total (2009-2018)* in Financial Table
Upgrade Sheepskin capacitor bank from 10.8 MVAR to 16.2 MVAR	2009	2010	3	reliability	Planned	F2248
Construct second Paddock-Rockdale 345-kV line and replace 345/138-kV transformer T22 at Rockdale Substation	2010	2010	3	economics	Planned	F1981
Install 2-16.33 MVAR 69-kV capacitor banks at Spring Green Substation	2010	2010	3	reliability	Planned	F2327
Uprate the Royster Substation terminals	2010	2010	3	reliability	Planned	F2317
Uprate Point Beach-Sheboygan Energy Center 345-kV circuit L111 to 167 degrees F	2010	2010	4	economics	Proposed	F1988
Install 2-32 MVAR capacitor banks at Summit 138-kV Substation	2010	2010	5	reliability	Proposed	F2256
Expand 345-kV switchyard at Oak Creek to interconnect one new generator	2010	2010	5	new generation	Planned	F1729
Uprate Oak Creek-Root River 138-kV line	2010	2010	5	new generation	Planned	F2140
Uprate Oak Creek-Nicholson 138-kV line	2010	2010	5	new generation	Planned	F2112
Upgrade Bain-Albers 138-kV line	2010	2010	5	reliability	Proposed	F2461

Table PR-3
Transmission System Additions for 2010 (continued)

System Additions	System Need Year	Projected In-Service Year	Planning Zone	Need Category	Planned, Proposed or Provisional	Cost Estimate - Refer to *Funding Project* and *Sum of Total (2009-2018)* in Financial Table
Construct a 138-kV bus at Pleasant Valley Substation to permit second distribution transformer interconnection	2010	2010	5	T-D interconnection	Planned	F2086
Construct second Shorewood-Humboldt 138-kV underground cable*	2012	2010	5	reliability	Proposed	F2487

Defined in Previous 10-Year Assessment
Revised in scope from Previous 10-Year Assessment
New to this 10-Year Assessment

Table PR-4
Transmission System Additions for 2011

System Additions	System Need Year	Projected In-Service Year	Planning Zone	Need Category	Planned, Proposed or Provisional	Cost Estimate - Refer to *Funding Project* and *Sum of Total (2009-2018)* in Financial Table
Install 1-4.08 MVAR capacitor bank at North Bluff 69-kV Substation	2010	2011	2	reliability	Provisional	F2490
Replace two overhead Blount-Ruskin 69-kV lines with one underground 69-kV line	2010	2011	3	Completion of earlier project per agreement with the City of Madison	Proposed	F2628
Rebuild the Y-119 Verona to Oregon 69-kV line	2008	2011	3	reliability, condition	Proposed	F2469
Rebuild Y-33 Brodhead to South Monroe 69-kV line	2011	2011	3	generation interconnection, reliability	Planned	F2526
Uprate terminal limitations at McCue for the Y-79 McCue-Milton Lawns 69-kV line	2011	2011	3	reliability	Proposed	F2405
Install 2-24.5 MVAR 138-kV capacitor bank and 1-18 MVAR 69-kV capacitor bank at Brick Church substation	2011	2011	3	reliability	Provisional	F2404
Reconfigure Kewaunee 345/138-kV switchyard and install a second 500 MVA 345/138-kV transformer	2011	2011	4	reliability, condition	Proposed	F2437
Rebuild 2.37 miles of 69 kV from Sunset Point to Pearl Ave with 477 ACSR	2011	2011	4	reliability	Planned	F1361

Defined in Previous 10-Year Assessment
Revised in scope from Previous 10-Year Assessment
New to this 10-Year Assessment

Table PR-5
Transmission System Additions for 2012

System Additions	System Need Year	Projected In-Service Year	Planning Zone	Need Category	Planned, Proposed or Provisional	Cost Estimate - Refer to *Funding Project* and *Sum of Total (2009-2018)* in Financial Table
Construct 115-kV line from new Woodmin Substation to the Clear Lake Substation	2012	2012	1	T-D interconnection	Proposed	F2495
Uprate overhead portions of Straits-McGulpin 138-kV circuits #1 & #3 to 230 F degree summer emergency ratings	2012	2012	2	reliability	Provisional	TBD
Rebuild/convert Straits-Pine River 138-kV lines 6904/5	2012	2012	2	reliability	Provisional	F2833
Install 138/69-kV 150 MVA transformer at Pine River	2012	2012	2	reliability	Provisional	F2834
Install 138/69-kV 150 MVA transformer at Nine Mile	2012	2012	2	reliability	Provisional	F2834
Install 138/69-kV 150 MVA transformer at Lakehead Rapid River	2012	2012	2	reliability	Provisional	TBD
Construct tap from the Kinross load to Pine River/Nine Mile 69-kV line	2012	2012	2	T-D interconnection, reliability	Provisional	F2836
Construct/convert Pine River-Nine Mile 138/69-kV double-circuit line	2012	2012	2	reliability	Provisional	F2836
Rebuild part of the Y-8 Dane-Dam Heights 69-kV line*	2015	2012	3	reliability, asset renewal, potential T-D interconnection	Provisional	F1602
Uprate Y-40 Gran Grae-Boscobel 69-kV line to achieve a 99 MVA summer emergency rating*	2017	2012	3	reliability	Proposed	F1444

Table PR-5
Transmission System Additions for 2012 (continued)

System Additions	System Need Year	Projected In-Service Year	Planning Zone	Need Category	Planned, Proposed or Provisional	Cost Estimate - Refer to *Funding Project* and *Sum of Total (2009-2018)* in Financial Table
Construct Canal-Dunn Road 138-kV line	2012	2012	4	reliability	Proposed	F1358
Install 60 MVA 138/69-kV transformer at Dunn Road	2012	2012	4	reliability	Proposed	F1358
Install 3-75 MVAR capacitor banks at Bluemound Substation	2012	2012	5	reliability	Proposed	F2650

Defined in Previous 10-Year Assessment
Revised in scope from Previous 10-Year Assessment
New to this 10-Year Assessment

Table PR-6
Transmission System Additions for 2013

System Additions	System Need Year	Projected In-Service Year	Planning Zone	Need Category	Planned, Proposed or Provisional	Cost Estimate - Refer to *Funding Project* and *Sum of Total (2009-2018)* in Financial Table
Construct Monroe County-Council Creek 161-kV line and Timberwolf 69-kV switching station	2013	2013	1	economics, reliability	Proposed	F2454
Install a 161/138-kV transformer at Council Creek Substation	2013	2013	1	economics, reliability	Proposed	F2454
Uprate Council Creek-Petenwell 138-kV line	2013	2013	1	economics, reliability	Proposed	F2849
Upgrade Mckenna 6.3 MVAR capacitor bank to 12.25 MVAR and install a second new 12.25 MVAR capacitor bank	2013	2013	1	reliability	Provisional	F2519
Install second Chandler 138/69-kV transformer	2013	2013	2	reliability	Provisional	TBD
Increase ground clearance of M38-Atlantic 69-kV line from 120 to 167 degrees F	2009	2013	2	reliability	Provisional	TBD
Uprate Fitchburg-Nine Springs 69-kV and Royster-Pflaum 69-kV lines and move AGA load to the Royster-Femrite 69-kV line	2006	2013	3	reliability	Proposed	F2088
Rebuild Y-32 Colley Road-Brick Church 69-kV line	2013	2013	3	reliability, condition	Provisional	F1670
Install 2-16.33 MVAR 69-kV capacitor banks at Nine Springs Substation	2013	2013	3	reliability	Proposed	F2088
Install a 138/69-kV transformer at Bass Creek Substation	2010	2013	3	reliability	Proposed	F1869

Table PR-6
Transmission System Additions for 2013 (continued)

System Additions	System Need Year	Projected In-Service Year	Planning Zone	Need Category	Planned, Proposed or Provisional	Cost Estimate - Refer to *Funding Project* and *Sum of Total (2009-2018)* in Financial Table
Uprate X-12 Town Line Road-Bass Creek 138-kV line to 300 deg F	2010	2013	3	reliability	Proposed	F1869
Construct 345-kV line from Rockdale to West Middleton	2013	2013	3	reliability	Planned	F1435
Construct a 345-kV bus and install a 345/138 kV 500 MVA transformer at West Middleton Substation	2013	2013	3	reliability	Planned	F1435
Uprate Y-61 Sheepskin-Dana 69-kV line to 95 MVA	2013	2013	3	reliability	Proposed	F2583
Uprate Arcadian-Waukesha 138-kV lines KK9942/KK9962	2010	2013	5	reliability	Provisional	F2142
Replace two existing 345/138-kV transformers at Arcadian Substation with 1-500 MVA transformer	2010	2013	5	reliability	Provisional	F2539

Defined in Previous 10-Year Assessment
Revised in scope from Previous 10-Year Assessment
New to this 10-Year Assessment

Table PR-7
Transmission System Additions for 2014

System Additions	System Need Year	Projected In-Service Year	Planning Zone	Need Category	Planned, Proposed or Provisional	Cost Estimate - Refer to *Funding Project* and *Sum of Total (2009-2018)* in Financial Table
Construct a 69-kV line from SW Ripon to the Ripon-Metomen 69-kV line	2014	2014	1	T-D interconnection	Provisional	F2053
Uprate Munising-Seney-Blaney Park 69-kV line to 167 degrees F	2014	2014	2	reliability	Provisional	TBD
Construct Gwinn-Forsyth second 69-kV line	2014	2014	2	reliability	Provisional	TBD
Install 2-16.33 MVAR 69-kV capacitor banks and 2-24.5 MVAR 138-kV capacitor banks at Femrite Substation	2014	2014	3	reliability	Provisional	F2516
Install 1-16.33 MVAR 69-kV capacitor bank at Verona Substation	2014	2014	3	reliability	Provisional	F2520

Defined in Previous 10-Year Assessment
Revised in scope from Previous 10-Year Assessment
New to this 10-Year Assessment

Table PR-8
Transmission System Additions for 2015

System Additions	System Need Year	Projected In-Service Year	Planning Zone	Need Category	Planned, Proposed or Provisional	Cost Estimate - Refer to *Funding Project* and *Sum of Total (2009-2018)* in Financial Table
Replace the existing 46 MVA Hillman 138/69-kV transformer with a 100 MVA transformer	2015	2015	3	reliability	Provisional	F0339
Install 1-8.16 MVAR capacitor bank at Boscobel 69-kV Substation and upgrade existing 5.4 MVAR bank with an 8.16 MVAR bank	2015	2015	3	reliability	Provisional	F2518
Uprate Columbia 345/138-kV transformer T-22 to 527 MVA	2015	2015	3	reliability	Provisional	F2135
Upgrade Oak Creek-Pennsylvania 138-kV line	2015	2015	5	reliability	Provisional	F2473

Defined in Previous 10-Year Assessment
Revised in scope from Previous 10-Year Assessment
New to this 10-Year Assessment

Table PR-9
Transmission System Additions for 2016

System Additions	System Need Year	Projected In-Service Year	Planning Zone	Need Category	Planned, Proposed or Provisional	Cost Estimate - Refer to *Funding Project* and *Sum of Total (2009-2018)* in Financial Table
Upgrade 4.1 MVAR capacitor bank to 8.2 MVAR and install a new 8.2 MVAR capacitor bank at Ripon 69-kV Substation	2016	2016	1	reliability	Provisional	F2477
Install a second 138/69-kV transformer at Spring Green with a 100 MVA summer normal rating	2016	2016	3	reliability	Provisional	F2445
Uprate X-67 Portage-Trienda 138-kV line to 373 MVA	2016	2016	3	reliability	Provisional	F2092
Construct new 138-kV line from North Lake Geneva to South Lake Geneva Substation	2016	2016	3	reliability, T-D interconnection	Provisional	F2587
Construct new 138-kV bus and install a 138/69-kV 100 MVA transformer at South Lake Geneva Substation	2016	2016	3	reliability	Provisional	F2587
Install 2-16.33 MVAR 69-kV capacitor banks at Eden Substation	2016	2016	3	reliability	Provisional	F2515
Install 4-49 MVAR 138-kV capacitor banks at Concord Substation	2016	2016	3	reliability, economics	Provisional	F2489
Uprate the 6986 Royster to Sycamore 69-kV line to 115 MVA	2016	2016	3	reliability	Provisional	F2471
Install 2-16.33 MVAR 69-kV capacitor banks at Sun Prairie	2016	2016	3	reliability	Provisional	F2475
Replace two existing 138/69-kV transformers at Glenview Substation with 100 MVA transformers	2016	2016	4	reliability	Provisional	F2079

Table PR-9
Transmission System Additions for 2016 (continued)

System Additions	System Need Year	Projected In-Service Year	Planning Zone	Need Category	Planned, Proposed or Provisional	Cost Estimate - Refer to *Funding Project* and *Sum of Total (2009-2018)* in Financial Table
Construct second Dunn Road-Egg Harbor 69-kV line	2016	2016	4	reliability	Provisional	F0181

Defined in Previous 10-Year Assessment
Revised in scope from Previous 10-Year Assessment
New to this 10-Year Assessment

Table PR-10
Transmission System Additions for 2017

System Additions	System Need Year	Projected In-Service Year	Planning Zone	Need Category	Planned, Proposed or Provisional	Cost Estimate - Refer to *Funding Project* and *Sum of Total (2009-2018)* in Financial Table
Install a second 138/69-kV transformer at Wautoma Substation	2017	2017	1	reliability	Provisional	F2480
Replace 138/69-kV transformer at Metomen Substation	2017	2017	1	reliability	Proposed	F1867
Uprate Castle Rock-Mckenna 69-kV line	2017	2017	1	reliability, economic benefits	Provisional	F2491
Uprate Y159 Brick Church-Walworth 69-kV line to 115 MVA	2017	2017	3	reliability	Provisional	F2153
Construct West Middleton-Blount 138-kV line	2017	2017	3	reliability	Provisional	F2466
Construct a Lake Delton-Birchwood 138-kV line	2017	2017	3	reliability	Provisional	F1638
Install 2-12.25 MVAR 69-kV capacitor banks at Mazomanie Substation	2017	2017	3	reliability	Provisional	F2517
Construct 69-kV double-circuit line between McCue and Lamar substations	2017	2017	3	reliability		F2558

Table PR-10
Transmission System Additions for 2017 (continued)

System Additions	System Need Year	Projected In-Service Year	Planning Zone	Need Category	Planned, Proposed or Provisional	Cost Estimate - Refer to *Funding Project* and *Sum of Total (2009-2018)* in Financial Table
Install 2-16.33 MVAR 69-kV capacitor banks at Dam Heights	2017	2017	3	reliability	Provisional	F2474

Defined in Previous 10-Year Assessment
Revised in scope from Previous 10-Year Assessment
New to this 10-Year Assessment

Table PR-11
Transmission System Additions for 2018

System Additions	System Need Year	Projected In-Service Year	Planning Zone	Need Category	Planned, Proposed or Provisional	Cost Estimate - Refer to *Funding Project* and *Sum of Total (2009-2018)* in Financial Table
Convert Necedah distribution substation from 69 kV to 138 kV	2018	2018	1	reliability	Provisional	F2560
Construct Fairwater-Mackford Prairie 69-kV line	2018	2018	1	reliability	Provisional	F2105
Install 2-16.33 Mvar 69-kV capacitor banks at North Monroe	2018	2018	3	reliability	Provisional	F2472
Construct Spring Valley-Twin Lakes-South Lake Geneva 138-kV line	2018	2018	3	T-D interconnection, reliability	Provisional	F2570
Replace two existing 138/69-kV transformers at Sunset Point Substation with 100 MVA transformers	2018	2018	4	economic benefits	Provisional	F2080

Defined in Previous 10-Year Assessment
Revised in scope from Previous 10-Year Assessment
New to this 10-Year Assessment

Table PR-12
Transmission System Additions for 2019

System Additions	System Need Year	Projected In-Service Year	Planning Zone	Need Category	Planned, Proposed or Provisional	Cost Estimate - Refer to *Funding Project* and *Sum of Total (2009-2018)* in Financial Table
Construct a Horicon-East Beaver Dam 138-kV line	2019	2019	3	reliability	Provisional	F1640
Install 2-32 MVAR capacitor banks at Mukwonago 138-kV Substation	2019	2019	5	reliability	Provisional	F2493

Defined in Previous 10-Year Assessment
Revised in scope from Previous 10-Year Assessment
New to this 10-Year Assessment

Table PR-13
Transmission System Additions beyond 2019

System Additions	System Need Year	Projected In-Service Year	Planning Zone	Need Category	Planned, Proposed or Provisional	Cost Estimate - Refer to *Funding Project* and *Sum of Total (2009-2018)* in Financial Table
Install 28.8 MVAR capacitor bank at Butternut 138-kV Substation	2020	2020	4	reliability	Provisional	F1403
Uprate the Melissa-Tayco to 229 MVA (300F)	2020	2020	4	reliability, economics	Provisional	F2434
Install 138/69-kV transformer at Custer Substation	2020	2020	4	reliability, economics	Provisional	F2081
Construct Shoto to Custer 138-kV line	2020	2020	4	reliability, economics	Provisional	F2081
Rebuild/Convert Bayport-Suamico-Sobieski-Pioneer 69-kV line to 138 kV	2020	2020	4	reliability, condition	Provisional	F1619
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	2021	2021	1	reliability	Provisional	F2105
Construct a 345-kV bus, install a 345/138-kV 500 MVA transformer at North Randolph and loop the Columbia to South Fond Du Lac 345-kV line into the substation	2021	2021	3	reliability	Provisional	F2093
Install 2-16.33 MVAR 69-kV capacitor banks at Rio	2022	2022	3	reliability	Provisional	F2557
Install a 12.2 MVAR capacitor bank at Hilltop 69-kV Substation	2023	2023	1	reliability	Provisional	F2476

Table PR-13
Transmission System Additions beyond 2019

System Additions	System Need Year	Projected In-Service Year	Planning Zone	Need Category	Planned, Proposed or Provisional	Cost Estimate - Refer to *Funding Project* and *Sum of Total (2009-2018)* in Financial Table
Reconductor Ramsey-Harbor 138-kV line	TBD	TBD	5	reliability	Provisional	TBD

Defined in Previous 10-Year Assessment
Revised in scope from Previous 10-Year Assessment
New to this 10-Year Assessment

Table PR-14
Zone 1 Transmission System Additions

System Additions	System Need Year	Projected In-Service Year	Planning Zone	Need Category	Planned, Proposed or Provisional
Rebuild Arpin-Rocky Run 345-kV line	2010	2010	1	condition	Planned
Construct 69-kV line from new Warrens Substation to the Council Creek-Tunnel City 69-kV line	2010	2010	1	T-D interconnection	Planned
Construct Brandon-Fairwater 69-kV line	2010	2010	1	T-D interconnection	Planned
Replace Metomen 69-kV breaker	2010	2010	1	reliability, condition	Planned
Construct 115-kV line from new Woodmin Substation to the Clear Lake Substation	2012	2012	1	T-D interconnection	Proposed
Construct Monroe County-Council Creek 161-kV line and Timberwolf 69-kV switching station	2013	2013	1	economics, reliability	Proposed
Install a 161/138-kV transformer at Council Creek Substation	2013	2013	1	economics, reliability	Proposed
Uprate Council Creek-Petenwell 138-kV line	2013	2013	1	economics, reliability	Proposed
Upgrade Mckenna 6.3 MVAR capacitor bank to 12.25 MVAR and install a second new 12.25 MVAR capacitor bank	2013	2013	1	reliability	Provisional
Construct a 69-kV line from SW Ripon to the Ripon-Metomen 69-kV line	2014	2014	1	T-D interconnection	Provisional
Upgrade 4.1 MVAR capacitor bank to 8.2 MVAR and install a new 8.2 MVAR capacitor bank at Ripon 69-kV Substation	2016	2016	1	reliability	Provisional

Table PR-14 (continued)
Zone 1 Transmission System Additions

System Additions	System Need Year	Projected In-Service Year	Planning Zone	Need Category	Planned, Proposed or Provisional
Install a second 138/69-kV transformer at Wautoma Substation	2017	2017	1	reliability	Provisional
Replace 138/69-kV transformer at Metomen Substation	2017	2017	1	reliability	Proposed
Uprate Castle Rock-Mckenna 69-kV line	2017	2017	1	reliability, economic benefits	Provisional
Convert Necedah distribution substation from 69 kV to 138 kV	2018	2018	1	reliability	Provisional
Construct Fairwater-Mackford Prairie 69-kV line	2018	2018	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	2021	2021	1	reliability	Provisional
Install a 12.2 MVAR capacitor bank at Hilltop 69-kV Substation	2023	2023	1	reliability	Provisional

Table PR-15
Zone 2 Transmission System Additions

System Additions	System Need Year	Projected In-Service Year	Planning Zone	Need Category	Planned, Proposed or Provisional
Uprate the Chandler-Masonville 69-kV line summer normal and emergency ratings from 120 deg F to 167 deg F	2009	2009	2	reliability	Proposed
Install 1-4.08 MVAR capacitor bank at L'Anse 69 kV	2008	2009	2	reliability	Proposed
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	2009	2	reliability, condition	Proposed
Install 1-8.16 MVAR capacitor banks at the M38 138-kV Substation	2009	2009	2	reliability	Proposed
Uprate Chandler-Cornell 69-kV line clearance from 120 to 167 deg F	2009	2009	2	reliability	Proposed
Install 1-8.2 MVAR capacitor bank at Hiawatha 138-kV Substation	2009	2009	2	reliability	Proposed
Install 1-4.08 MVAR capacitor banks at Osceola 69 kV	2009	2009	2	reliability	Proposed
Uprate the Chandler-Delta #1 69-kV line summer emergency rating from 120 deg F to 167 deg F	2009	2009	2	reliability	Proposed

Table PR-15 (continued)
Zone 2 Transmission System Additions

System Additions	System Need Year	Projected In-Service Year	Planning Zone	Need Category	Planned, Proposed or Provisional
Uprate the Chandler-Delta #2 69-kV line summer emergency rating to from 120 deg F 167 deg F	2009	2009	2	reliability	Proposed
Rebuild/convert Conover-Plains 69-kV line to 138 kV	2010	2010	2	reliability, transfer capability	Planned
Construct 138 kV bus and install a 138/69 kV, 60 MVA transformer at Aspen Substation	2010	2010	2	reliability	Planned
Install 1-16.33 MVAR capacitor bank at Indian Lake 138-kV Substation	2010	2010	2	reliability	Proposed
Install 1-4.08 MVAR capacitor bank at North Bluff 69-kV Substation	2010	2011	2	reliability	Provisional
Uprate overhead portions of Straits-McGulpin 138-kV circuits #1 & #3 to 230 F degree summer emergency ratings	2012	2012	2	reliability	Provisional
Rebuild/convert Straits-Pine River 138-kV lines 6904/5	2012	2012	2	reliability	Provisional
Install 138/69-kV 150 MVA transformer at Pine River	2012	2012	2	reliability	Provisional
Install 138/69-kV 150 MVA transformer at Nine Mile	2012	2012	2	reliability	Provisional
Install 138/69-kV 150 MVA transformer at Lakehead Rapid River	2012	2012	2	reliability	Provisional

Table PR-15 (continued)
Zone 2 Transmission System Additions

System Additions	System Need Year	Projected In-Service Year	Planning Zone	Need Category	Planned, Proposed or Provisional
Construct tap from the Kinross load to Pine River/Nine Mile 69-kV line	2012	2012	2	T-D interconnection, reliability	Provisional
Construct/convert Pine River-Nine Mile 138/69-kV double-circuit line	2012	2012	2	reliability	Provisional
Install second Chandler 138/69-kV transformer	2013	2013	2	reliability	Provisional
Increase ground clearance of M38-Atlantic 69-kV line from 120 to 167 degrees F	2009	2013	2	reliability	Provisional
Uprate Munising-Seney-Blaney Park 69-kV line to 167 degrees F	2014	2014	2	reliability	Provisional
Construct Gwinn-Forsyth second 69-kV line	2014	2014	2	reliability	Provisional

Table PR-16
Zone 3 Transmission System Additions

System Additions	System Need Year	Projected In-Service Year	Planning Zone	Need Category	Planned, Proposed or Provisional
Construct a Jefferson-Tyranena-Stony Brook 138-kV line	2006	2009	3	reliability	Planned
Uprate X-8 Rockdale to Boxelder 138-kV line	2008	2009	3	reliability	Planned
Uprate Y-41 Walworth- North Lake Geneva 69-kV to achieve a 69 MVA summer emergency rating	2009	2009	3	reliability	Planned
Uprate Y-61 McCue-Lamar 69-kV line to achieve 300 deg F line ratings and install 2-12.45 Mvar 69 kV capacitor banks at Lamar Substation	2008	2010	3	reliability	Proposed
Uprate X-23 Colley Road-Marine 138-kV line terminals	2014	2010	3	reliability	Proposed
Construct new Oak Ridge-Verona 138-kV line and install a 138/69-kV transformer at Verona with a 100 MVA summer normal rating	2009	2010	3	reliability	Planned
Upgrade Sheepskin capacitor bank from 10.8 MVAR to 16.2 MVAR	2009	2010	3	reliability	Planned
Construct second Paddock-Rockdale 345-kV line and replace 345/138-kV transformer T22 at Rockdale Substation	2010	2010	3	economics	Planned
Install 2-16.33 MVAR 69-kV capacitor banks at Spring Green Substation	2010	2010	3	reliability	Planned
Uprate the Royster Substation terminals	2010	2010	3	reliability	Planned

Table PR-16 (continued)
Zone 3 Transmission System Additions

System Additions	System Need Year	Projected In-Service Year	Planning Zone	Need Category	Planned, Proposed or Provisional
Replace two overhead Blount-Ruskin 69-kV lines with one underground 69-kV line	2010	2011	3	completion of earlier project per agreement with the City of Madison	Proposed
Rebuild the Y-119 Verona to Oregon 69-kV line	2008	2011	3	reliability, condition	Proposed
Rebuild Y-33 Brodhead to South Monroe 69-kV line	2011	2011	3	generation interconnection, reliability	Planned
Uprate terminal limitations at McCue for the Y-79 McCue-Milton Lawns 69-kV line	2011	2011	3	reliability	Proposed
Install 2-24.5 MVAR 138-kV capacitor bank and 1-18 MVAR 69-kV capacitor bank at Brick Church substation	2011	2011	3	reliability	Provisional
Rebuild part of the Y-8 Dane-Dam Heights 69-kV line	2015	2012	3	reliability, asset renewal, potential T-D interconnection	Provisional
Uprate Y-40 Gran Grae-Boscobel 69-kV line to achieve a 99 MVA summer emergency rating	2017	2012	3	reliability	Proposed
Uprate Fitchburg-Nine Springs 69-kV and Royster-Pflaum 69-kV lines and move AGA load to the Royster-Femrite 69-kV line	2006	2013	3	reliability	Proposed
Rebuild Y-32 Colley Road-Brick Church 69-kV line	2013	2013	3	reliability, condition	Provisional

Table PR-16 (continued)
Zone 3 Transmission System Additions

System Additions	System Need Year	Projected In-Service Year	Planning Zone	Need Category	Planned, Proposed or Provisional
Install 2-16.33 MVAR 69-kV capacitor banks at Nine Springs Substation	2013	2013	3	reliability	Proposed
Install a 138/69-kV transformer at Bass Creek Substation	2010	2013	3	reliability	Proposed
Uprate X-12 Town Line Road-Bass Creek 138-kV line to 300 deg F	2010	2013	3	reliability	Proposed
Construct 345-kV line from Rockdale to West Middleton	2013	2013	3	reliability	Planned
Construct a 345-kV bus and install a 345/138 kV 500 MVA transformer at West Middleton Substation	2013	2013	3	reliability	Planned
Uprate Y-61 Sheepskin-Dana 69-kV line to 95 MVA	2013	2013	3	reliability	Proposed
Install 2-16.33 MVAR 69-kV capacitor banks and 2-24.5 MVAR 138-kV capacitor banks at Femrite Substation	2014	2014	3	reliability	Provisional
Install 1-16.33 MVAR 69-kV capacitor bank at Verona Substation	2014	2014	3	reliability	Provisional
Replace the existing 46 MVA Hillman 138/69-kV transformer with a 100 MVA transformer	2015	2015	3	reliability	Provisional
Install 1-8.16 MVAR capacitor bank at Boscobel 69-kV Substation and upgrade existing 5.4 MVAR bank with an 8.16 MVAR bank	2015	2015	3	reliability	Provisional
Uprate Columbia 345/138-kV transformer T-22 to 527 MVA	2015	2015	3	reliability	Provisional

Table PR-16 (continued)
Zone 3 Transmission System Additions

System Additions	System Need Year	Projected In-Service Year	Planning Zone	Need Category	Planned, Proposed or Provisional
Install a second 138/69-kV transformer at Spring Green with a 100 MVA summer normal rating	2016	2016	3	reliability	Provisional
Uprate X-67 Portage-Trienda 138-kV line to 373 MVA	2016	2016	3	reliability	Provisional
Construct new 138-kV line from North Lake Geneva to South Lake Geneva Substation	2016	2016	3	reliability, T-D interconnection	Provisional
Construct new 138-kV bus and install a 138/69-kV 100 MVA transformer at South Lake Geneva Substation	2016	2016	3	reliability	Provisional
Install 2-16.33 MVAR 69-kV capacitor banks at Eden Substation	2016	2016	3	reliability	Provisional
Install 4-49 MVAR 138-kV capacitor banks at Concord Substation	2016	2016	3	reliability, economics	Provisional
Uprate the 6986 Royster to Sycamore 69-kV line to 115 MVA	2016	2016	3	reliability	Provisional
Install 2-16.33 MVAR 69-kV capacitor banks at Sun Prairie	2016	2016	3	reliability	Provisional
Uprate Y159 Brick Church-Walworth 69-kV line to 115 MVA	2017	2017	3	reliability	Provisional
Construct West Middleton-Blount 138-kV line	2017	2017	3	reliability	Provisional
Construct a Lake Delton-Birchwood 138-kV line	2017	2017	3	reliability	Provisional

Table PR-16 (continued)
Zone 3 Transmission System Additions

System Additions	System Need Year	Projected In-Service Year	Planning Zone	Need Category	Planned, Proposed or Provisional
Install 2-12.25 MVAR 69-kV capacitor banks at Mazomanie Substation	2017	2017	3	reliability	Provisional
Construct 69-kV double-circuit line between McCue and Lamar substations	2017	2017	3	reliability	Provisional
Install 2-16.33 MVAR 69-kV capacitor banks at Dam Heights	2017	2017	3	reliability	Provisional
Install 2-16.33 MVAR 69-kV capacitor banks at North Monroe	2018	2018	3	reliability	Provisional
Construct Spring Valley-Twin Lakes-South Lake Geneva 138-kV line	2018	2018	3	T-D interconnection, reliability	Provisional
Construct a Horicon-East Beaver Dam 138-kV line	2019	2019	3	reliability	Provisional
Construct a 345-kV bus, install a 345/138-kV 500 MVA transformer at North Randolph and loop the Columbia to South Fond Du Lac 345-kV line into the substation	2021	2021	3	reliability	Provisional
Install 2-16.33 MVAR 69-kV capacitor banks at Rio	2022	2022	3	reliability	Provisional

Table PR-17
Zone 4 Transmission System Additions

System Additions	System Need Year	Projected In-Service Year	Planning Zone	Need Category	Planned, Proposed or Provisional
Install a second 138-kV reserve auxiliary transformer (RAT) at Kewaunee and remove tertiary auxiliary transformer (TAT)	2009	2009	4	reliability	Proposed
Uprate Point Beach-Sheboygan Energy Center 345-kV circuit L111 to 167 degrees F	2010	2010	4	economics	Proposed
Reconfigure Kewaunee 345/138-kV switchyard and install a second 500 MVA 345/138-kV transformer	2011	2011	4	reliability, condition	Proposed
Rebuild 2.37 miles of 69 kV from Sunset Point to Pearl Ave with 477 ACSR	2011	2011	4	reliability	Planned
Construct Canal-Dunn Road 138-kV line	2012	2012	4	reliability	Proposed
Install 60 MVA 138/69-kV transformer at Dunn Road	2012	2012	4	reliability	Proposed
Replace two existing 138/69-kV transformers at Glenview Substation with 100 MVA transformers	2016	2016	4	reliability	Provisional
Construct second Dunn Road-Egg Harbor 69-kV line	2016	2016	4	reliability	Provisional
Replace two existing 138/69-kV transformers at Sunset Point Substation with 100 MVA transformers	2018	2018	4	economic benefits	Provisional
Install 28.8 MVAR capacitor bank at Butternut 138-kV Substation	2020	2020	4	reliability	Provisional

Table PR-17 (continued)
Zone 4 Transmission System Additions

System Additions	System Need Year	Projected In-Service Year	Planning Zone	Need Category	Planned, Proposed or Provisional
Uprate the Melissa-Tayco to 229 MVA (300F)	2020	2020	4	reliability, economics	Provisional
Install 138/69-kV transformer at Custer Substation	2020	2020	4	reliability, economics	Provisional
Construct Shoto to Custer 138-kV line	2020	2020	4	reliability, economics	Provisional
Rebuild/Convert Bayport-Suamico-Sobieski-Pioneer 69-kV line to 138 kV	2020	2020	4	reliability, condition	Provisional

Table PR-18
Zone 5 Transmission System Additions

System Additions	System Need Year	Projected In-Service Year	Planning Zone	Need Category	Planned, Proposed or Provisional
Construct a 138-kV bus at Pleasant Valley Substation to permit second distribution transformer interconnection	2010	2010	5	T-D interconnection	Planned
Install 2-32 MVAR capacitor banks at Summit 138-kV Substation	2010	2010	5	reliability	Proposed
Expand 345-kV switchyard at Oak Creek to interconnect one new generator	2010	2010	5	new generation	Planned
Uprate Oak Creek-Root River 138-kV line	2010	2010	5	new generation	Planned
Uprate Oak Creek-Nicholson 138-kV line	2010	2010	5	new generation	Planned
Upgrade Bain-Albers 138-kV line	2010	2010	5	reliability	Proposed
Construct second Shorewood-Humboldt 138-kV underground cable	2012	2010	5	reliability	Proposed
Install 3-75 MVAR capacitor banks at Bluemound Substation	2012	2012	5	reliability	Proposed
Uprate Arcadian-Waukesha 138-kV lines KK9942/KK9962	2010	2013	5	reliability	Provisional
Replace two existing 345/138-kV transformers at Arcadian Substation with 1-500 MVA transformer	2010	2013	5	reliability	Provisional

Table PR-18 (continued)
Zone 5 Transmission System Additions

System Additions	System Need Year	Projected In-Service Year	Planning Zone	Need Category	Planned, Proposed or Provisional
Upgrade Oak Creek-Pennsylvania 138-kV line	2015	2015	5	reliability	Provisional
Install 2-32 MVAR capacitor banks at Mukwonago 138-kV Substation	2019	2019	5	reliability	Provisional
Reconductor Ramsey-Harbor 138-kV line	TBD	TBD	5	reliability	Provisional

Table PR-19
Identified Needs and Transmission Lines Requiring New Right-of-Way

Identified need	Potential solutions	Approx. line mileage		System need year	Projected In-service year	Planning zone
		Total	New ROW			
relieve overloads or low voltages under contingency	Construct a Jefferson-Tyranena-Stony Brook 138-kV line	13.9	13.9	2006	2009	35
T-D interconnection request	Construct 69-kV line from new Warrens Substation to the Council Creek-Tunnel City 69-kV line	4.5	4.5	2010	2010	1
T-D interconnection request	Construct Brandon-Fairwater 69-kV line	4	4	2010	2010	1
relieve overloads or low voltages under contingency	Construct new Oak Ridge-Verona 138-kV line and install a 138/69-kV transformer at Verona with a 100 MVA summer normal rating	6.1	3	2009	2010	3
T-D interconnection request	Construct 115-kV line from new Woodmin Substation to the Clear Lake Substation	7.5	7.5	2012	2012	1
T-D interconnection request, relieve overloads or low voltages under contingency	Construct tap from the Kinross load to Pine River/Nine Mile 69-kV line	2	2	2012	2012	2
relieve overloads or low voltages under contingency	Construct 345-kV line from Rockdale to West Middleton	32.4	32.4	2013	2013	3
T-D interconnection request	Construct a 69-kV line from SW Ripon to the Ripon-Metomen 69-kV line	1.5	1.5	2014	2014	1
relieve overloads or low voltages under contingency, T-D interconnection request	Construct new 138-kV line from North Lake Geneva to South Lake Geneva Substation	5.1	5.1	2016	2016	35
relieve overloads or low voltages under contingency	Construct second Dunn Road-Egg Harbor 69-kV line	12.66	12.66	2016	2016	4
relieve overloads or low voltages under contingency	Construct a Lake Delton-Birchwood 138-kV line	5	5	2017	2017	31
relieve overloads or low voltages under contingency	Construct Fairwater-Mackford Prairie 69-kV line	0	5	2018	2018	1
T-D interconnection request,relieve overloads or low voltages under contingency	Construct Spring Valley-Twin Lakes-South Lake Geneva 138-kV line	24.0	15	2018	2018	35
relieve overloads or low voltages under contingency	Construct a Horicon-East Beaver Dam 138-kV line	10	10	2019	2019	34
relieve overloads or low voltages under contingency, economics	Construct Shoto to Custer 138-kV line	9.94	9.94	2020	2020	4

Table PR-20
Transmission Line Rebuilds/Reconductors, New Circuits and Voltage Conversions on Existing Right-of-Way

Identified need	Lines to be rebuilt/reconductored on existing ROW	Approx. mileage of rebuilt, reconductored or uprated lines	System need year	Projected In-service year	Planning zone
asset renewal	Rebuild Arpin-Rocky Run 345-kV line	20	2010	2010	1
relieve overloads or low voltages under contingency, transfer capability	Rebuild/convert Conover-Plains 69-kV line to 138 kV	71	2010	2010	2
economics	Construct second Paddock-Rockdale 345-kV line and replace 345/138-kV transformer T22 at Rockdale Substation	30	2010	2010	3
accommodate new generation	Uprate Oak Creek-Nicholson 138-kV line	6.8	2010	2010	5
relieve overloads or low voltages under contingency	Construct second Shorewood-Humboldt 138-kV underground cable	0.75	2012	2010	5
Completion of earlier project per agreement with the City of Madison	Replace two overhead Blount-Ruskin 69-kV lines with one underground 69-kV line	2	2010	2011	3
relieve overloads or low voltages under contingency, asset renewal	Rebuild the Y-119 Verona to Oregon 69-kV line	11	2008	2011	3
generation interconnection, relieve overloads or low voltages under contingency	Rebuild Y-33 Brodhead to South Monroe 69-kV line	18	2011	2011	3
relieve overloads or low voltages under contingency	Rebuild 2.37 miles of 69 kV from Sunset Point to Pearl Ave with 477 ACSR	2.37	2011	2011	4
relieve overloads or low voltages under contingency	Rebuild/convert Straits-Pine River 138-kV lines 6904/5	50	2012	2012	2
relieve overloads or low voltages under contingency	Construct/convert Pine River-Nine Mile 138/69-kV double-circuit line	40	2012	2012	2
relieve overloads or low voltages under contingency, asset renewal, potential T-D interconnection request	Rebuild part of the Y-8 Dane-Dam Heights 69-kV line	5	2015	2012	31
relieve overloads or low voltages under contingency	Construct Canal-Dunn Road 138-kV line	7.64	2012	2012	4
economics, relieve overloads or low voltages under contingency	Construct Monroe County-Council Creek 161-kV line and Timberwolf 69-kV switching station	17.9	2013	2013	1
economics, relieve overloads or low voltages under contingency	Uprate Council Creek-Petenwell 138-kV line	32	2013	2013	1

Table PR-20
Transmission Line Rebuilds/Reconductors, New Circuits and Voltage Conversions on Existing Right-of-Way

Identified need	Lines to be rebuilt/reconductored on existing ROW	Approx. mileage of rebuilt, reconductored or uprated lines	System need year	Projected In-service year	Planning zone
relieve overloads or low voltages under contingency	Increase ground clearance of M38-Atlantic 69-kV line from 120 to 167 degrees F	22	2009	2013	2
relieve overloads or low voltages under contingency, asset renewal	Rebuild Y-32 Colley Road-Brick Church 69-kV line	19.7	2013	2013	3
relieve overloads or low voltages under contingency	Construct Gwinn-Forsyth second 69-kV line	1	2014	2014	2
relieve overloads or low voltages under contingency	Uprate the 6986 Royster to Sycamore 69-kV line to 115 MVA	3.35	2016	2016	3
relieve overloads or low voltages under contingency	Construct West Middleton-Blount 138-kV line	5	2017	2017	3
relieve overloads or low voltages under contingency	Construct 69-kV double-circuit line between McCue and Lamar substations	4.0	2017	2017	3
relieve overloads or low voltages under contingency, asset renewal	Rebuild/Convert Bayport-Suamico-Sobieski-Pioneer 69-kV line to 138 kV	21.2	2020	2020	4
relieve overloads or low voltages under contingency	Reconductor Ramsey-Harbor 138-kV line	8.4	TBD	TBD	5

Table PR-21
New Substations, Transformer Additions and Replacements

Identified need	Potential additions or replacements	Transformer Capacity (MVA)		System need year	Projected In-service year	Planning zone
		Install	Replace			
relieve overloads under contingency	Construct 138 kV bus and install a 138/69 kV, 60 MVA transformer at Aspen Substation	60	0	2010	2010	2
relieve overloads under contingency, replace aging facilities	Reconfigure Kewaunee 345/138-kV switchyard and install a second 500 MVA 345/138-kV transformer	500	0	2011	2011	4
relieve overloads under contingency	Install 138/69-kV 150 MVA transformer at Pine River	150	0	2012	2012	2
relieve overloads under contingency	Install 138/69-kV 150 MVA transformer at Nine Mile	150	0	2012	2012	2
relieve overloads under contingency	Install 138/69-kV 150 MVA transformer at Lakehead Rapid River	150	0	2012	2012	2
relieve overloads under contingency	Install 60 MVA 138/69-kV transformer at Dunn Road	60	0	2012	2012	4
economics, relieve overloads under contingency	Install a 161/138-kV transformer at Council Creek Substation	100	0	2013	2013	1
relieve overloads under contingency	Install second Chandler 138/69-kV transformer	0	40	2013	2013	2
relieve overloads under contingency	Install a 138/69-kV transformer at Bass Creek Substation	100	0	2010	2013	3
relieve overloads under contingency	Construct a 345-kV bus and install a 345/138 kV 500 MVA transformer at West Middleton Substation	500	0	2013	2013	3
relieve overloads under contingency	Replace two existing 345/138-kV transformers at Arcadian Substation with 1-500 MVA transformer	500	672	2010	2013	5
relieve overloads under contingency	Replace the existing 46 MVA Hillman 138/69-kV transformer with a 100 MVA transformer	47	0	2015	2015	3
relieve overloads under contingency	Uprate Columbia 345/138-kV transformer T-22 to 527 MVA	527	400	2015	2015	3
relieve overloads under contingency	Install a second 138/69-kV transformer at Spring Green with a 100 MVA summer normal rating	100	0	2016	2016	3
relieve overloads under contingency	Construct new 138-kV bus and install a 138/69-kV 100 MVA transformer at South Lake Geneva Substation	100	0	2016	2016	35
relieve overloads under contingency	Replace two existing 138/69-kV transformers at Glenview Substation with 100 MVA transformers	200	116	2016	2016	4

Table PR-21
New Substations, Transformer Additions and Replacements

Identified need	Potential additions or replacements	Transformer Capacity (MVA)		System need year	Projected In-service year	Planning zone
		Install	Replace			
relieve overloads under contingency	Install a second 138/69-kV transformer at Wautoma Substation	100	0	2017	2017	1
relieve overloads under contingency	Replace 138/69-kV transformer at Metomen Substation	100	47	2017	2017	1
relieve overloads under contingency	Convert Necedah distribution substation from 69 kV to 138 kV	N/A	N/A	2018	2018	1
economic benefits	Replace two existing 138/69-kV transformers at Sunset Point Substation with 100 MVA transformers	200	142	2018	2018	4
relieve overloads under contingency, economics	Install 138/69-kV transformer at Custer Substation	100	0	2020	2020	4
relieve overloads under contingency	Construct a 345-kV bus, install a 345/138-kV 500 MVA transformer at North Randolph and loop the Columbia to South Fond Du Lac 345-kV line into the substation	500	0	2021	2021	34

Table PR-22
Substation Equipment Additions and Replacements

Identified need	Potential additions or replacements	Capacitor bank Capacity (MVAR)	System Need Year	Projected In-Service Year	Planning Zone
relieve overloads or low voltages under contingency	Uprate the Chandler-Masonville 69-kV line summer normal and emergency ratings from 120 deg F to 167 deg F	N/A	2009	2009	2
relieve overloads or low voltages under contingency	Install 1-4.08 MVAR capacitor bank at L'Anse 69 kV	4.08	2008	2009	2
relieve overloads or low voltages under contingency, asset renewal	Construct ring bus at the Pine River 69-kV Substation and replace 1-5.4 MVAR capacitor bank with 2-4.08 MVAR banks	2.76	2008	2009	2
relieve overloads or low voltages under contingency	Install 1-8.16 MVAR capacitor banks at the M38 138-kV Substation	8.16	2009	2009	2
relieve overloads or low voltages under contingency	Uprate Chandler-Cornell 69-kV line clearance from 120 to 167 deg F	N/A	2009	2009	2
relieve overloads or low voltages under contingency	Install 1-8.2 MVAR capacitor bank at Hiawatha 138-kV Substation	8.2	2009	2009	2
relieve overloads or low voltages under contingency	Install 1-4.08 MVAR capacitor banks at Osceola 69 kV	4.08	2009	2009	2
relieve overloads or low voltages under contingency	Uprate the Chandler-Delta #1 69-kV line summer emergency rating from 120 deg F to 167 deg F	N/A	2009	2009	2
relieve overloads or low voltages under contingency	Uprate the Chandler-Delta #2 69-kV line summer emergency rating to from 120 deg F 167 deg F	N/A	2009	2009	2
relieve overloads or low voltages under contingency	Uprate X-8 Rockdale to Boxelder 138-kV line	N/A	2008	2009	35
relieve overloads or low voltages under contingency	Uprate Y-41 Walworth-North Lake Geneva 69-kV to achieve a 69 MVA summer emergency rating	N/A	2009	2009	3
relieve overloads or low voltages under contingency	Install a second 138-kV reserve auxiliary transformer (RAT) at Kewaunee and remove tertiary auxiliary transformer (TAT)	N/A	2009	2009	4
T-D interconnection request	Construct a 138-kV bus at Pleasant Valley Substation to permit second distribution transformer interconnection	N/A	2010	2010	5
relieve overloads or low voltages under contingency, asset renewal	Replace Metomen 69-kV breaker	N/A	2010	2010	1
relieve overloads or low voltages under contingency	Install 1-16.33 MVAR capacitor bank at Indian Lake 138-kV Substation	16.33	2010	2010	2
relieve overloads or low voltages under contingency	Uprate Y-61 McCue-Lamar 69-kV line to achieve 300 deg F line ratings and install 2-12.45 Mvar 69 kV capacitor banks at Lamar Substation	24.9	2008	2010	3

Table PR-22
Substation Equipment Additions and Replacements

Identified need	Potential additions or replacements	Capacitor bank Capacity (MVAR)	System Need Year	Projected In-Service Year	Planning Zone
relieve overloads or low voltages under contingency	Uprate X-23 Colley Road-Marine 138-kV line terminals	N/A	2014	2010	3
relieve overloads or low voltages under contingency	Upgrade Sheepskin capacitor bank from 10.8 MVAR to 16.2 MVAR	5.4	2009	2010	3
relieve overloads or low voltages under contingency	Install 2-16.33 MVAR 69-kV capacitor banks at Spring Green Substation	32	2010	2010	3
relieve overloads or low voltages under contingency	Uprate the Royster Substation terminals	N/A	2010	2010	3
relieve overloads or low voltages under contingency	Install 2-32 MVAR capacitor banks at Summit 138-kV Substation	64	2010	2010	5
accommodate new generation	Expand 345-kV switchyard at Oak Creek to interconnect one new generator	N/A	2010	2010	5
accommodate new generation	Uprate Oak Creek-Root River 138-kV line	N/A	2010	2010	5
economics	Uprate Point Beach-Sheboygan Energy Center 345-kV circuit L111 to 167 degrees F	N/A	2010	2010	4
relieve overloads or low voltages under contingency	Upgrade Bain-Albers 138-kV line	N/A	2010	2010	5
relieve overloads or low voltages under contingency	Install 1-4.08 MVAR capacitor bank at North Bluff 69-kV Substation	4.08	2010	2011	2
relieve overloads or low voltages under contingency	Uprate terminal limitations at McCue for the Y-79 McCue-Milton Lawns 69-kV line	N/A	2011	2011	35
relieve overloads or low voltages under contingency	Install 2-24.5 MVAR 138-kV capacitor bank and 1-18 MVAR 69-kV capacitor bank at Brick Church substation	67	2011	2011	35
relieve overloads or low voltages under contingency	Install 3-75 MVAR capacitor banks at Bluemound Substation	200	2012	2012	5
relieve overloads or low voltages under contingency	Uprate overhead portions of Straits-McGulpin 138-kV circuits #1 & #3 to 230 F degree summer emergency ratings	N/A	2012	2012	2
relieve overloads or low voltages under contingency	Uprate Y-40 Gran Grae-Boscobel 69-kV line to achieve a 99 MVA summer emergency rating	N/A	2017	2012	3
relieve overloads or low voltages under contingency	Upgrade Mckenna 6.3 MVAR capacitor bank to 12.25 MVAR and install a second new 12.25 MVAR capacitor bank	15.3	2013	2013	1
relieve overloads or low voltages under contingency	Uprate Fitchburg-Nine Springs 69-kV and Royster-Pflaum 69-kV lines and move AGA load to the Royster-Femrite 69-kV line	N/A	2006	2013	3

Table PR-22
Substation Equipment Additions and Replacements

Identified need	Potential additions or replacements	Capacitor bank Capacity (MVAR)	System Need Year	Projected In-Service Year	Planning Zone
relieve overloads or low voltages under contingency	Install 2-16.33 MVAR 69-kV capacitor banks at Nine Springs Substation	32.66	2013	2013	3
relieve overloads or low voltages under contingency	Uprate X-12 Town Line Road-Bass Creek 138-kV line to 300 deg F	N/A	2010	2013	3
relieve overloads or low voltages under contingency	Uprate Y-61 Sheepskin-Dana 69-kV line to 95 MVA	N/A	2013	2013	3
relieve overloads or low voltages under contingency	Uprate Arcadian-Waukesha 138-kV lines KK9942/KK9962	N/A	2010	2013	5
relieve overloads or low voltages under contingency	Uprate Munising-Seney-Blaney Park 69-kV line to 167 degrees F	N/A	2014	2014	2
relieve overloads or low voltages under contingency	Install 2-16.33 MVAR 69-kV capacitor banks and 2-24.5 MVAR 138-kV capacitor banks at Femrite Substation	81.66	2014	2014	3
relieve overloads or low voltages under contingency	Install 1-16.33 MVAR 69-kV capacitor bank at Verona Substation	16.33	2014	2014	3
relieve overloads or low voltages under contingency	Install 1-8.16 MVAR capacitor bank at Boscobel 69-kV Substation and upgrade existing 5.4 MVAR bank with an 8.16 MVAR bank	10.8	2015	2015	3
relieve overloads or low voltages under contingency	Upgrade Oak Creek-Pennsylvania 138-kV line	N/A	2015	2015	5
relieve overloads or low voltages under contingency	Upgrade 4.1 MVAR capacitor bank to 8.2 MVAR and install a new 8.2 MVAR capacitor bank at Ripon 69-kV Substation	12.3	2016	2016	1
relieve overloads or low voltages under contingency	Uprate X-67 Portage-Trienda 138-kV line to 373 MVA	N/A	2016	2016	31
relieve overloads or low voltages under contingency	Install 2-16.33 MVAR 69-kV capacitor banks at Eden Substation	32.66	2016	2016	3
relieve overloads or low voltages under contingency, economics	Install 4-49 MVAR 138-kV capacitor banks at Concord Substation	196	2016	2016	35
relieve overloads or low voltages under contingency	Install 2-16.33 Mvar 69-kV capacitor banks at Sun Prairie	32.66	2016	2016	3
relieve overloads or low voltages under contingency, economic benefits	Uprate Castle Rock-Mckenna 69-kV line	N/A	2017	2017	1
relieve overloads or low voltages under contingency	Uprate Y159 Brick Church-Walworth 69-kV line to 115 MVA	N/A	2017	2017	35
relieve overloads or low voltages under contingency	Install 2-12.25 MVAR 69-kV capacitor banks at Mazomanie Substation	24.5	2017	2017	3

Table PR-22
Substation Equipment Additions and Replacements

Identified need	Potential additions or replacements	Capacitor bank Capacity (MVAR)	System Need Year	Projected In-Service Year	Planning Zone
relieve overloads or low voltages under contingency	Install 2-16.33 Mvar 69-kV capacitor banks at Dam Heights	32.66	2017	2017	31
relieve overloads or low voltages under contingency	Install 2-16.33 Mvar 69-kV capacitor banks at North Monroe	32.66	2018	2018	3
relieve overloads or low voltages under contingency	Install 2-32 Mvar capacitor banks at Mukwonago 138-kV Substation	64	2019	2019	5
relieve overloads or low voltages under contingency	Install 28.8 MVAR capacitor bank at Butternut 138-kV Substation	28.8	2020	2020	4
relieve overloads or low voltages under contingency, economics	Uprate the Melissa-Tayco to 229 MVA (300F)	N/A	2020	2020	4
relieve overloads or low voltages under contingency	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	N/A	2021	2021	1
relieve overloads or low voltages under contingency	Install 2-16.33 Mvar 69-kV capacitor banks at Rio	32.66	2022	2022	34
relieve overloads or low voltages under contingency	Install a 12.2 MVAR capacitor bank at Hilltop 69-kV Substation	12.2	2023	2023	1

Table PR-23			
Summary of Cancellations, Deferrals, Changes, Possible Changes and New Projects for the 2009 10-Year Assessment			
PROJECTS CANCELED	**Former In-Service Date**	**Planning Zone**	**Reason for Removal**
A second distribution transformer at Somers Substation requires a rebuild of the Racine-Somers-Albers 138-kV line; extend Albers 138-kV bus to permit connecting the Racine-Somers-Albers radial line to the Albers 138-kV bus	2011	5	Updated study results
Construct a 345-kV bus at Bain Substation	2008	5	Updated study results
Install a second 138/69-kV transformer at McCue Substation	2016	3	Updated study results
Upgrade Bain-Kenosha 138-kV line	2013	5	Equipment replaced during construction of another project
Install 2-16.3 MVAR capacitor bank at Mears Corners 138-kV Substation	TBD	4	Updated load/model information
Install 2-16.3 MVAR capacitor bank at Rosiere 138-kV Substation	TBD	4	Updated load/model information
Construct Evansville-Brooklyn 69-kV line	TBD	3	Updated load/model information
Construct Verona-North Monroe 138-kV line	TBD	3	Updated load/model information
Replace the 1200 A breaker at Edgewater T22 345/138-kV transformer	TBD	4	Equipment replaced during construction of another project
Uprate 138-kV line from Kewaunee to East Krok	TBD	4	Updated load/model information
Rebuild Blaney Park-Munising 69 kV to 138 kV	2014	2	Upper Peninsula Collaborative updated study results
Install 2-16.3 MVAR capacitor bank at Aviation Substation	TBD	4	Updated load/model information
PROJECTS DEFERRED	New Date	Planning Zone	Reason for Deferral
Construct a 138-kV bus at Pleasant Valley Substation to permit second distribution transformer interconnection	2010	5	Was 2009; Resource scheduling requirements
Uprate Y-61 McCue-Lamar 69-kV line to achieve 300 deg F line ratings and install 2-12.45 Mvar 69-kV capacitor banks at Lamar Substation	2010	3	Was 2009 and provisional status; now proposed; delay due to resource scheduling requirements
Rebuild 2.37 miles of 69 kV from Sunset Point to Pearl Ave with 477 ACSR	2011	4	Was 2009; Resource scheduling requirements

Table PR-23			
Summary of Cancellations, Deferrals, Changes, Possible Changes and New Projects for the 2009 10-Year Assessment			
PROJECTS DEFERRED	**New date**	**Planning Zone**	**Reason for Deferral**
Install 3-75 MVAR capacitor banks at Bluemound Substation	2012	5	Was 2010; Resource scheduling requirements
Construct Monroe County-Council Creek 161-kV line and Timberwolf 69-kV switching station	2013	1	Was 2012; coordination with other entities
Install a 161/138-kV transformer at Council Creek Substation	2013	1	Was 2012; coordination with other entities
Uprate Council Creek-Petenwell 138-kV line	2013	1	Was 2012; coordination with other entities
Rebuild Y-32 Colley Road-Brick Church 69-kV line	2013	3	Was 2012; Resource scheduling requirements
Uprate X-12 Town Line Road-Bass Creek 138-kV line to 300 deg F	2013	3	Was 2012; Resource scheduling requirements
Uprate Arcadian-Waukesha 138-kV lines KK9942/KK9962	2013	5	Was 2010 proposed status, now provisional; updated study results
Replace two existing 345/138-kV transformers at Arcadian Substation with 1-500 MVA transformer	2013	5	Was 2010, Resource scheduling requirements
Install 1-8.16 MVAR capacitor bank at Boscobel 69-kV Substation and upgrade existing 5.4 MVAR bank with an 8.16 MVAR bank	2015	3	Was 2013; updated load/model information
Upgrade Oak Creek-Pennsylvania 138-kV line	2015	5	Was 2014; updated load/model information
Install a second 138/69-kV transformer at Spring Green with a 100 MVA summer normal rating	2016	3	Was 2013; updated load/model information
Uprate X-67 Portage-Trienda 138-kV line to 373 MVA	2016	3	Was 2014; updated load/model information
Construct new 138-kV line from North Lake Geneva to South Lake Geneva Substation	2016	3	Was 2015; updated study results
Construct new 138-kV bus and install a 138/69-kV 100 MVA transformer at South Lake Geneva Substation	2016	3	Was 2015; updated study results

Table PR-23			
Summary of Cancellations, Deferrals, Changes, Possible Changes and New Projects for the 2009 10-Year Assessment			
PROJECTS DEFERRED (continued)	**New date**	**Planning Zone**	**Reason for Deferral**
Install 2-16.33 MVAR 69-kV capacitor banks at Eden Substation	2016	3	Was 2014; updated load/model information
Install 4-49 MVAR 138-kV capacitor banks at Concord Substation	2016	3	Was 2011; updated load/model information
Replace two existing 138/69-kV transformers at Glenview Substation with 100 MVA transformers	2016	4	Was 2014; updated load/model information
Replace 138/69-kV transformer at Metomen Substation	2017	1	Was 2013; now a two-phased approach – breaker replaced in 2010, transformer in 2017
Uprate Y159 Brick Church-Walworth 69-kV line to 115 MVA	2017	3	Was 2015; updated load/model information
Construct a Lake Delton-Birchwood 138-kV line	2017	3	Was 2015; updated load/model information
Install 2-12.25 MVAR 69-kV capacitor banks at Mazomanie Substation	2017	3	Was 2014; updated load/model information
Construct a Horicon-East Beaver Dam 138-kV line	2019	3	Was 2014; updated load/model information
Install 2-32 Mvar capacitor banks at Mukwonago 138-kV Substation	2019	5	Was 2014; updated load/model information
Install 28.8 MVAR capacitor bank at Butternut 138-kV Substation	2020	4	Was 2016; updated load/model information
Uprate the Melissa-Tayco to 229 MVA (300F)	2020	4	Was 2016; updated load/model information
Install 138/69-kV transformer at Custer Substation	2020	4	Was 2016; updated load/model information
Construct Shoto to Custer 138-kV line	2020	4	Was 2016; updated load/model information
Rebuild/Convert Bayport-Suamico-Sobieski-Pioneer 69-kV line to 138 kV	2020	4	Was 2016; updated load/model information

Table PR-23			
Summary of Cancellations, Deferrals, Changes, Possible Changes and New Projects for the 2009 10-Year Assessment			
PROJECTS DEFERRED (continued)	**New date**	**Planning Zone**	Reason for Deferral
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	2021	1	Was 2018; updated load/model information
Construct a 345-kV bus, install a 345/138-kV 500 MVA transformer at North Randolph and loop the Columbia to South Fond Du Lac 345-kV line into the substation	2021	3	Was 2018; updated load/model information
Install 2-16.33 Mvar 69-kV capacitor banks at Rio	2022	3	Was 2019; updated load/model information
OTHER PROJECT CHANGES AND POSSIBLE CHANGES	**Date**	**Planning Zone**	**Nature of Change or Update**
Install 1-8.2 MVAR capacitor bank at Hiawatha 138-kV Substation	2009	2	Was 16.33 MVAR capacitor bank
Uprate the Chandler-Delta #1 69-kV line summer emergency rating from 120 deg F to 167 deg F	2009	2	Was 2010 in-service date
Uprate the Chandler-Delta #2 69-kV line summer emergency rating to from 120 deg F 167 deg F	2009	2	Was 2010 in-service date
Replace Metomen 69-kV breaker	2010	1	Metomen xfmr project broken into two pieces; Phase I 2010 and Phase II 2017
Uprate X-23 Colley Road-Marine 138-kV line terminals	2010	3	Was 2014 in-service date
Construct second Shorewood-Humboldt 138-kV underground cable	2010	5	Was 2012 in-service date
Install 1-4.08 MVAR capacitor bank at North Bluff 69-kV Substation	2011	2	Was yet to be determined in-service date
Replace two overhead Blount-Ruskin 69-kV lines with one underground 69-kV line	2011	3	Was yet to be determined in-service date, provisional status now proposed

Table PR-23			
Summary of Cancellations, Deferrals, Changes, Possible Changes and New Projects for the 2009 10-Year Assessment			
OTHER PROJECT CHANGES AND POSSIBLE CHANGES (continued)	Date	Planning Zone	Nature of Change or Update
Uprate overhead portions of Straits-McGulpin 138-kV circuits #1 & #3 to 230 F degree summer emergency ratings	2012	2	Was yet to be determined in-service date
Rebuild part of the Y-8 Dane-Dam Heights 69-kV line	2012	3	Was 2015 in-service date; now combined with earlier maintenance project
Uprate Y-40 Gran Grae-Boscobel 69-kV line to achieve a 99 MVA summer emergency rating	2012	3	Was 2014 in-service date
Uprate Fitchburg-Nine Springs 69-kV and Royster-Pflaum 69-kV lines and move AGA load to the Royster-Femrite 69-kV line	2013	3	Was loop Nine Springs-Pflaum into Femrite
Construct second Dunn Road-Egg Harbor 69-kV line	2016	4	Was proposed status, now provisional
Uprate Castle Rock-Mckenna 69-kV line	2017	1	Was 2018 in-service date
NEW PROJECTS	In-Service Date	Planning Zone	Reason for Project
Uprate Point Beach-Sheboygan Energy Center 345-kV circuit L111 to 167 degrees F	2010	4	Market congestion
Rebuild/convert Straits-Pine River 138-kV lines 6904/5	2012	2	Upper Peninsula Collaborative study results
Install 138/69-kV 150 MVA transformer at Pine River	2012	2	Upper Peninsula Collaborative study results
Install 138/69-kV 150 MVA transformer at Nine Mile	2012	2	Upper Peninsula Collaborative study results
Install 138/69-kV 150 MVA transformer at Lakehead Rapid River	2012	2	Upper Peninsula Collaborative study results
Construct tap from the Kinross load to Pine River/Nine Mile 69-kV line	2012	2	Upper Peninsula Collaborative study results
Construct/convert Pine River-Nine Mile 138/69-kV double-circuit line	2012	2	Upper Peninsula Collaborative study results
Install second Chandler 138/69-kV transformer	2013	2	Upper Peninsula Collaborative study results
Install 2-16.33 MVAR 69-kV capacitor banks at Nine Springs Substation	2013	3	Upper Peninsula Collaborative study results

Table PR-23			
Summary of Cancellations, Deferrals, Changes, Possible Changes and New Projects for the 2009 10-Year Assessment			
NEW PROJECTS (continued)	In-Service Date	Planning Zone	Reason for Project
Uprate Munising-Seney-Blaney Park 69-kV line to 167 degrees F	2014	2	Upper Peninsula Collaborative study results
Construct Gwinn-Forsyth second 69-kV line	2014	2	Upper Peninsula Collaborative study results