

Appendix B

Summary of Changes to the 2003 10-Year Assessment

For the below tables, the following color-coding scheme was utilized for indicating what type of change has been made to the 10-Year Assessment from 2003 to the 2003 Update (pages 90-95 of this document). Projects that have been removed from the 2003 10-Year Assessment can be found on pages 96 and 97 of this document.

Color	Reason for Change to the 2003 TYA Update
Gray	in-service year
Light Blue	new to the 10-Year Assessment
White	other change in scope

Changes to the 2003 10-Year Assessment Update include the following major and minor projects:

Major Project: Plains-Stiles 138 kV Double-Circuit Rebuild

Associated Major Project	Planned Additions	Previous In-Service Year (if applicable)	Projected In-Service Year	Planning Zone	Need Category	Planned, Proposed or Provisional	Capital Cost Estimate (Millions)
Plains-Stiles	Rebuild existing West Marinette-Menominee 69 kV line to double circuit 138/69 kV	N/A	2005	2	reliability, service limitation	Planned	\$ 6.9
Plains-Stiles	Convert Menominee-Rosebush 69 kV line to 138 kV	N/A	2005	2	reliability, service limitation	Planned	\$ 11.4
Plains-Stiles	Rebuild/reconductor Rosebush-Amberg 138 kV line	N/A	2005	2	reliability, service limitation	Planned	\$ 6.8

Major Project: Arrowhead-Weston 345 kV line

Associated Major Project	Planned Additions	Reason for Change (if applicable)	Projected In-Service Year	Planning Zone	Need Category	Planned, Proposed or Provisional	Capital Cost Estimate (Millions)
Arrowhead-Weston	Construct new Gardner Park 345/115 kV substation	Weston renamed Gardner Park	2006	1	service limitation, reliability, import capability & Weston stability	Proposed	included in A-W estimate
Arrowhead-Weston	Replace 345/115 kV 200 MVA transformer at Weston with two 500 MVA units at the Gardner Park substation	Weston renamed Gardner Park	2006	1	service limitation, reliability, import capability & Weston stability	Planned	included in A-W estimate
Arrowhead-Weston	Construct Gardner Park-Stone Lake 345 kV line	Weston renamed Gardner Park	2006	1	service limitation, reliability, import capability & Weston stability	Planned	\$ 262.1
Arrowhead-Weston	Install a 345/161 kV transformer at Stone Lake (temporary installation for construction outages)	N/A	2006	1	reliability	Proposed	included in A-W estimate
Arrowhead-Weston	Install 1-40 MVAR capacitor banks at Arpin 138 kV	N/A	2008	1	achieve transfer capability associated with Arrowhead-Weston	Proposed	included in A-W estimate
Arrowhead-Weston	Install 6-34 MVAR capacitor banks at Gardner Park 115 kV	N/A	2008	1	achieve transfer capability associated with Arrowhead-Weston	Proposed	included in A-W estimate
Arrowhead-Weston	Install 4-50 MVAR capacitor bank at Arrowhead 230 kV	N/A	2008	1	achieve transfer capability associated with Arrowhead-Weston	Proposed	included in A-W estimate

Major Project: Elm Road Generation

Associated Major Project	Planned Additions	Previous In-Service Year	Projected In-Service Year	Planning Zone	Need Category	Planned, Proposed or Provisional	Capital Cost Estimate (Millions)
Elm Road generation	Expand Oak Creek 345 kV switchyard to interconnect one new generator	2007	2009	5	new generation	Proposed	\$ 18.8
Elm Road generation	Construct an Oak Creek-Brookdale 345 kV line installing 4 mi. new structures, converting 16.2 mi. of non-operative 230 kV and 5 mi. 138 kV	2007	2010	5	new generation	Proposed	\$ 17.3
Elm Road generation	Construct a 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	2007	2010	5	new generation	Proposed	\$ 19.3
Elm Road generation	Construct a 345/138 kV switchyard at Brookdale to accommodate two 345 kV lines, a 500 MVA 345/138 kV transformer and 4-138 kV lines plus two 138-26.2 kV transformers	2007	2010	5	new generation	Proposed	\$ 14.8
Elm Road generation	Convert and reconductor Oak Creek-Bluemound 230 kV line K862 to 345 kV and loop into Arcadian 345 kV substation	2011	2012	5	new generation	Proposed	\$ 34.8
Elm Road generation	Construct Oak Creek-Racine 345 kV line with 4 mi new structures and conductor, plus convert 9.6 mi. 138 kV line KK812 to 345 kV	2011	2012	5	new generation	Proposed	\$ 8.1
Elm Road generation	Expand Oak Creek 345 kV switchyard to interconnect three new generators	2011	2012	5	new generation	Proposed	\$ 21.5
Elm Road generation	Associated other 138 or 345 kV facilities	2007-2011	2009-2012	5	new generation	Proposed	\$ 55.9

Other Major Projects

Associated Major Project	Planned Additions	Previous In-Service Year or Reason for Change (if applicable)	Projected In-Service Year	Planning Zone	Need Category	Planned, Proposed or Provisional	Capital Cost Estimate (Millions)
Fox Energy	Construct a Fox Energy-Forest Junction 345 kV line	N/A	2005	4	new generation	Planned	\$ 4.5
Fox Energy	Construct new Fox Energy 345 kV switchyard	N/A	2005	4	new generation	Planned	\$ 7.1
	Construct a Jefferson-Lake Mills-Stony Brook 138 kV line	2006	2007	3	reliability, T-D interconnection	Proposed	\$ 11.3
Rockdale-Lannon Junction	Construct a new Lannon Junction substation at intersection of Granville-Arcadian 345 kV, Sussex-Tamarack 138 kV and Sussex-Germantown 138 kV lines; install a 345/138 kV, 500 MVA transformer	No longer looping in Forest Junction-Arcadian 345 kV line	2007	5	reliability & Germantown generation stability	Proposed	\$ 14.2
Weston 4 generation	Construct new Central Wisconsin 345 kV substation	N/A	2009	1 & 4	service limitation, reliability, import capability & Weston stability	Proposed	\$ 10.5
Weston 4 generation	Construct Gardner Park-Central Wisconsin 345 kV line	N/A	2009	1	service limitation, reliability, import capability & Weston stability	Proposed	\$ 86.6
Morgan-Werner West	String a new 138 kV line from Clintonville-Werner West primarily on Morgan-Werner West 345 kV line structures	N/A	2009	4	reliability, service limitation	Proposed	included in Morgan-Werner estimate
	Construct 345 kV line from Paddock to new Sugar River 345 kV switchyard; loop Kegonsa-West Middleton 345 kV line into Sugar River	Verona was renamed Sugar River	2012	3	reliability, transfer capability	Provisional	\$ 119.3

Minor Projects

Planned Additions	Previous In-Service Year or Reason for Change (if applicable)	Projected In-Service Year	Planning Zone	Need Category	Planned, Proposed or Provisional	Capital Cost Estimate (Millions)
Rebuild from Nordic to Randville SS (5 miles) of single circuit 69 kV line to double circuit 69 kV	2005	2004	2	reliability, condition	Planned	\$ 1.6
Construct a tap to Belle Plain from the Badger-Caroline 115 kV line	N/A	2004	4	T-D interconnection	Planned	\$ 1.1
Uprate Rocky Run-Northpoint 115 kV line terminal equipment at Northpoint	N/A	2005	1	reliability, new generation	Planned	\$ 0.06
Install 26 MVAR capacitor bank at Hartford	N/A	2005	5	reliability	Proposed	\$ 1.0
Install 69 kV phase shifter or fixed reactor at Council Creek	2004	2006	1	reliability	Proposed	\$ 1.9
Construct double circuit 138 kV line from Forest Junction/Charter Steel to Howards Grove	Was Erdman-Howards Grove	2006	4	T-D interconnection	Planned	\$ 8.2
Replace the two existing 33 MVA 138/69 kV transformers at Edgewater with two 60 MVA transformers	N/A	2006	4	reliability	Proposed	\$ 2.4
Replace the existing 46.7 MVA 138/69 kV transformer at South Sheboygan Falls with 100 MVA transformer	N/A	2006	4	reliability	Proposed	\$ 1.3
Replace the existing 46.7 MVA 138/69 kV transformer at Mullet River with 100 MVA transformer	N/A	2006	4	reliability	Proposed	\$ 1.3
Construct a Martin Road-South Fond du Lac/Ohmstead 138 kV line	N/A	2006	4	T-D interconnection	Planned	\$ 1.6
Construct an Eagle River-Cranberry/Three Lakes 115 kV line	2005	2007	1	T-D interconnection	Proposed	\$ 0.3
Construct Venus-Metonga 115 kV line	2005	2007	1	T-D interconnections	Proposed	\$ 5.0
Uprate Rockdale to Boxelder 138 kV line	2005	2007	3	reliability	Proposed	\$ 0.3

Minor Projects (continued)

Planned Additions	Previous In-Service Year or Reason for Change (if applicable)	Projected In-Service Year	Planning Zone	Need Category	Planned, Proposed or Provisional	Capital Cost Estimate (Millions)
Construct new 69 kV line from Brooklyn to Sugar River Substation	Was Brooklyn to Belleville	2007	3	reliability	Proposed	\$ 5.0
Construct Clear Lake-Arnett Road 115 kV line	2006	2008	1	T-D interconnection	Proposed	\$ 2.1
Construct a Rubicon-Hustisford 138 kV line	N/A	2008	3	reliability	Provisional	\$ 4.8
Rebuild Hustisford-Horicon 69 kV to 138 kV	N/A	2008	3	reliability	Provisional	\$ 2.7
Construct 138/69 kV substation at a site near Horicon and install a 138/69 kV transformer	N/A	2008	3	reliability	Provisional	\$ 2.8
Construct new 138 kV bus and 138/69 kV 100 MVA transformer at Sugar River Substation	Verona was renamed Sugar River	2009	3	reliability	Provisional	\$ 1.4
Construct new 138 kV line from Sugar River to Southeast Fitchburg Substation	Verona was renamed Sugar River	2009	3	reliability	Provisional	\$ 5.1

Projects Removed from the 2003 10-Year Assessment

Formerly Planned Additions	Projected In-Service Year	Planning Zone	Reason for Removal
Replace 400 A CT at S Fond du Lac 69 kV	2003	4	revised load/model information
Replace 600 A CT at N Fond du Lac 138 kV	2005	4	revised load/model information
Construct 2.5 miles of 138 kV line from Lodestar to Sheboygan Falls	2006	4	another alternative selected
Install a 138/69 kV, 60 MVA transformer at Sheboygan Falls	2006	4	another alternative selected
Install 10 MVAR capacitor bank at Jefferson 138 kV	2007	3	another alternative selected
Install 2-13 MVAR capacitor banks at Concord 138 kV	2007	3	another alternative selected
Construct a second Germantown-Lannon 138 kV line	2007	5	revised study results
Convert and reconductor Oak Creek-Bluemound 230 kV line K873 to 345 kV	2007	5	generation restudy results
Reconnect Oak Creek unit #7 to 345 kV switchyard	2007	5	generation restudy results
Expand 345 kV switchyard at Bluemound to accommodate three additional 345 kV lines and two additional 500 MVA 345/138 kV transformers	2011	5	generation restudy results
Reconnect Oak Creek unit #8 to 345 kV switchyard	2011	5	generation restudy results
Reroute Brookdale-Granville 345 kV line into expanded Bluemound 345 kV switchyard	2011	5	generation restudy results
Rebuild/convert South Fond du Lac-Springbrook 69 kV to 138 kV	2008	3	another alternative selected
Construct 138 kV bus and install a 138/69 kV transformer at Springbrook	2008	3	another alternative selected

Projects Removed from the 2003 10-Year Assessment (continued)

Formerly Planned Additions	Projected In-Service Year	Planning Zone	Reason for Removal
Construct 345 kV switchyard at Weston	2006	1	renamed Gardner Park
Install 2-25 MVAR capacitor banks at Arpin 115 kV	2008	1	another alternative selected
Install 2-40 MVAR capacitor banks at Weston 115 kV	2008	1	another alternative selected
Install 3-52 MVAR capacitor banks at Rocky Run 115 kV	2008	1	another alternative selected
Install second 345/115 kV 500 MVA transformer at Weston	2008	1	another alternative selected
Construct 138 kV line from Metonga to new Laona and operate at 115 kV	2006	1	canceled by customer
Construct South Beaver Dam-North Beaver Dam 138 kV line	2007	3	another alternative selected
Convert Academy-South Beaver Dam 69 kV line to 138 kV	2007	3	another alternative selected