

**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	3
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

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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	3
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	3
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

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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-Blanney 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	3
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	3
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	3
relieve overloads or low voltages under contingency	Install 2-12.25 MVAR 69-kV capacitor banks at Mazomanie Substation	24.5	2017	2017	3

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relieve overloads or low voltages under contingency	Install 2-16.33 Mvar 69-kV capacitor banks at Dam Heights	32.66	2017	2017	3
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	3
relieve overloads or low voltages under contingency	Install a 12.2 MVAR capacitor bank at Hilltop 69-kV Substation	12.2	2023	2023	1