

**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 (69B2, 69B3)	Upgrade McKenna 6.3 MVAR capacitor bank to 15.3 MVAR and upgrade Chaffee Creek 8.1 MVAR bank to 14.4 MVAR	29.7	2011	2011	1
relieve overloads or low voltages under contingency (C1), operating flexibility	Install 69-kV bus tie breaker at Delta Substation	N/A	2011	2011	2
relieve overloads or low voltages under contingency (B2)	Upgrade overhead portions of Straits-McGulpin 138-kV circuits #1 & #3 to 230 F degree summer emergency ratings	N/A	2012	2012	2
stability, operating flexibility	Replace five 69-kV breakers at Delta Substation	N/A	2012	2012	2
relieve overloads or low voltages under contingency (69B2)	Relocate Engadine 69-kV load	N/A	2011	2012	2
relieve overloads or low voltages under contingency (69B2)	Install 2-16.33 MVAR 69-kV capacitor banks at Nine Springs Substation	32.66	2008*	2013	3
relieve overloads or low voltages under contingency (69B2)	Upgrade Fitchburg-Nine Springs 69-kV and Royster-Pflaum 69-kV lines and move AGA load to the Royster-Femrite 69-kV line	N/A	2008*	2013	3
operating flexibility	Rebuild Pleasant Prairie 345-kV bus	N/A	2013	2013	5
relieve overloads or low voltages under contingency (B1)	Install power flow control at Straits 138-kV Substation	N/A	2010	2014	2
relieve overloads or low voltages under contingency (69B3)	Install 1-8.16 MVAR 69-kV capacitor banks at 18th Road	8.16	2014	2014	2
operating flexibility	Reconfigure Petenwell 138-kV bus	N/A	2011	2015	1
relieve overloads or low voltages under contingency (69B2)	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	>2026	2015	1

**Table PR-22
Substation Equipment Additions and Replacements (continued)**

Identified Need	Potential Additions or Replacements	Capacitor Bank Capacity (MVAR)	System Need Year	Projected In-service Year	Planning Zone
operating flexibility	Reconfigure Petenwell 138-kV bus	N/A	2011	2015	1
relieve overloads or low voltages under contingency (69B2)	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	>2026	2015	1
relieve overloads or low voltages under contingency (69B2)	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	10.92	>2026	2015	3
relieve overloads or low voltages under contingency (69B2, 69B3)	Uprate 6927 West Middleton-Stage Coach 69-kV line to 106 MVA SE	N/A	>2026	2015	3
relieve overloads or low voltages under contingency (B1)	Install 3-75 MVAR capacitor banks at Bluemound Substation	225	>2026	2015	5
relieve overloads or low voltages under contingency (B2)	Rebuild Arcadian-Waukesha 138-kV lines KK9942/KK9962	N/A	2016	2016	5
relieve overloads or low voltages under contingency (69B2, 69B3)	Uprate Castle Rock-Mckenna 69-kV line	8.5	2024	2017	1
economics, relieve overloads or low voltages under contingency (69B2)	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	>2026	2017	1
relieve overloads or low voltages under contingency (69B2)	Install 2-24.5 Mvar 138-kV capacitor bank and 1-18 Mvar 69-kV capacitor bank at Brick Church substation	67	>2026	2017	3
relieve overloads or low voltages under contingency (69B2)	Uprate Y87 North Monroe-South Monroe 69-kV line to 115 MVA SE	N/A	>2026	2018	3
accommodate new generation	Point Beach Substation: Install new series 345-kV breaker for circuit Q-303	N/A	2018	2018	4

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Substation Equipment Additions and Replacements (continued)**

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 (69B2)	Uprate Winneconne-Sunset Point 69-kV line Y-103	7.4	>2026	2019	1
relieve overloads or low voltages under contingency (69B2)	Uprate Ripon-Northwest Ripon 69-kV line Y-93	N/A	>2026	2019	1
relieve overloads or low voltages under contingency (A, B2)	Install 2-16.33 MVAR 69-kV capacitor banks at Eden Substation	32.66	>2026	2019	3
relieve overloads or low voltages under contingency (69B2)	Install 2-16.33 Mvar 69-kV capacitor banks at Dam Heights	32.66	>2026	2019	3
relieve overloads or low voltages under contingency (B2)	Install 4-49 MVAR 138-kV capacitor banks at Concord Substation	196	>2026	2020	3
relieve overloads or low voltages under contingency (B2)	Install 2-16.33 Mvar 69-kV capacitor banks at North Monroe	32.66	>2026	2021	3
relieve overloads or low voltages under contingency (A, B2, B3)	Install 1-16.33 MVAR 69-kV capacitor bank at Verona Substation	16.33	>2026	2021	3
relieve overloads or low voltages under contingency (69B2)	Uprate Y159 Brick Church-Walworth 69-kV line to 115 MVA	N/A	>2026	2021	3
relieve overloads or low voltages under contingency (69B2, 69B3)	Install 2-16.33 Mvar 69-kV capacitor banks at Sun Prairie	32.66	>2026	2022	3
relieve overloads or low voltages under contingency (B2)	Upgrade Oak Creek-Pennsylvania 138-kV line	N/A	>2026	2022	5
relieve overloads or low voltages under contingency (69B2)	Uprate X-67 Portage-Trienda 138-kV line to 373 MVA	N/A	>2026	2022	3
relieve overloads or low voltages under contingency (69B2)	Install 2-12.25 MVAR 69-kV capacitor banks at Mazomanie Substation	24.5	>2026	2023	3