Chapter 7 - Appendix A

Transmission and Distribution Supplemental Information

Table 7A.1 MTEP Transmission Projects in Missouri[1]

Project Approved	Project Title	Project Description	Category	Estimated Cost	Estimated In Service
MTEP11	MVP # 8 – Zachary - Maywood 345 kV Line	Zachary - Maywood 345 kV, 58 miles, 3000A. Establish a new 345 kV substation (Maywood) at Palmyra Tap	Multi Value	$153,369,959	2018
MTEP14	Dupo Ferry-Buck Knob Reconductoring	Dupo Ferry-Buck Knob 138 kV Line - Replace 22 mi. of 2-300 ACSR with maximum size conductor existing towers will support.	Other Condition	$31,367,940	2017
MTEP12	Prairie Dell Substation	Install 138 kV breakers, build 2.5 miles of new single circuit 138 kV and 3.1 miles of new 138 kV double circuit line	Other Reliability	$20,763,000	Deferred indefinitely
MTEP12	Wallen Creek Substation High-Side Transfer	Install 2-2000 A,138 kV PCBs	Other Reliability	$2,635,000	Was 2014 deferred to 2018
MTEP11	MVP # 7 – Zachary - Ottumwa 345 (The portion in MO is from Zachary to the Iowa state line)	Zachary Substation - New 560 MVA, 345/161 kV Transformer. New 71 mile 345 kV line from Zachary to Ottumwa with 3000 A summer emergency capability	Multi Value	$191,850,587	2018

[1] 4 CSR 240-22.045(3)(A)1; 4 CSR 240-22.045(3)(A)6

Project Approved	Project Title	Project Description	Category	Estimated Cost	Estimated In Service
MTEP11	MVP # 9 – Palmyra Tap (Maywood) – Quincy – Meredosia – Ipava & Meredosia – Pawnee (The portion in MO is from Palmyra Tap to the Illinois state line)	Palmyra Tap (Maywood) to Quincy to Meredosia to Ipava 345 line and Meredosia to Pawnee 345 kV line. Install additional transformers at Quincy, Meredosia and Pawnee.	Multi Value	$705,400,612	2016-2017

Table 7A.2 Transmission Projects under Consideration[2]

Project	Description	Status
Howard Bend Substation Connection	Howard Bend 138-12 kV Substation - Provide 138 kV ring bus connection from Mason-Carrollton-8 138 kV line to new Howard Bend Substation. Install 1-138 kV, 2000 A PCB at Carrollton Substation as a bus-tie.	In service approximately 2022
Warrenton-Lincoln Bulk 161 kV Line	Warrenton-Lincoln Bulk Substation 161 kV - Establish a second 161 kV supply to Lincoln Bulk Substation from Warrenton Substation. 10 miles of new 161 kV line, 2-161 kV, 2000 A PCBs at Warrenton Substation.	In service approximately 2025
Belleau 345/138 kV Substation - Second Transformer	Install 2nd. 560 MVA, 345/138 kV Transformer and Complete 345 kV Ring Bus	In service approximately 2025
Belleau 345/138 kV Substation - Install 138 kV capacitor bank	Install 138 kV, 120 Mvar capacitor bank at Belleau Substation	In service approximately 2021
Mason Transformer Replacement	Mason 345/138 kV Substation - Replace 345/138 kV, 560 MVA Transformer #2 with a 700 MVA unit	In service approximately 2021
Camden-Ullman 138 kV Line	Camden-Ulman 138 kV Line - Construct approximately 16 miles of 138 kV line between Camden Substation and Ulman (switching station connecting to Maries-Osage-1 138 kV line), with 1600 A summer emergency capability. Install 300 MVA, 161/138 kV transformer	In service approximately 2030.

[2] 4 CSR 240-22.045(6)

Project	Description	Status
Overton-Columbia Terminal Upgrade	Overton-Huntsdale-Columbia 161 kV - Replace 800 A CT at Overton Terminal with 1200 A unit.	In service approximately 2018
Pershall Substation	Install 4-2000 A breaker ring bus and connect to Berkeley-Sioux-1 138 kV to establish 138 kV connections for Pershall 138-12.47 kV Sub	In service approximately 2021
Mason-Carrollton-8 Increase Relay Limit	Mason-Carrollton-8 138 kV Line - Increase relay load limit on Mason-Mason 34 kV Substation segment of line to permit carrying full line capability	In service approximately 2018
Cotter Creek 138-34.5 kV Substation Supplies	Cotter Creek 138-34.5 kV Substation - Provide 138 kV supplies to new Cotter Creek Substation. Install a 2000 A, 138 kV PCB at Joachim Substation, and extend new 138 kV line from Joachim to Cotter Creek Substation. Also, for the second 138 kV supply to Cotter Creek, a new 3-2000 A breaker 138 kV switching station (Olympian Village) will be established in the Joachim-St. Francois-2 138 kV line, with a 138 kV line extended from Olympian Village Switching Station to Cotter Creek Substation.	In service approximately 2023
Fountain Lake 2nd. Transformer	Install 2nd. 138-12.5 kV Transformer	In service approximately 2018
Meramec-Watson-2 138 kV Line Reconductoring	Reconductor 3.7 miles of 795 kcmil AA conductor between Watson Substation and the Mackenzie Switch Rack with conductor capable of carrying 1200 A under summer emergency conditions.	In service approximately 2018
Sioux-Huster-3 138 kV Reconductoring	Reconductor 5.9 miles of 954 kcmil ACSR with conductor capable of carrying 1600 A under summer emergency conditions. Replace 1200 A terminal equipment (disconnect switches, CT's, bus conductor) at Huster with equipment capable of carrying 1600 A or better.	In service approximately 2024
Rush-Joachim-2 345 kV Position Upgrade	Rush Island 345 kV Switchyard - Upgrade the Rush Island terminal of the Rush Island-Joachim-2 345 kV line to a minimum of 2500 A capability by replacing the 2000 A wavetrap and reconnecting the 2000:5A CTs to 2500:5A.	In service approximately 2017
Buick Smelter Substation Relocation	Relocate substation. Remove existing substation, install 2 motor-operated 161 kV switches and 2 customer owned and installed 161 kV circuit switchers. Make provisions for the addition of a third 161-4 kV transformer.	approximately 2020

Project	Description	Status
Hannibal, West-Palmyra-2 161 kV Line Clearance	Increase ground clearance on 9.2 miles of 795 kcmil ACSR conductor to permit operation at 120 degrees C	In service approximately 2018
Berntie-Jim Hill 161 kV Line	Construct approximately 20 miles of 161 kV line between Jim Hill Plant and Berntie Substation in southeast, Missouri. The new line should have a 2000 A summer emergency rating. Construct 161 kV ring bus at Berntie Substation. Install 161 kV breaker at Jim Hill.	In service approximately 2020

Table 7A.3 Transmission and Distribution Avoided Costs[3]

$/kW-yr	Avoided Transmission	Avoided Distribution
2018	$6	$17
2019	$6	$17
2020	$6	$17
2021	$6	$18
2022	$6	$18
2023	$6	$18
2024	$6	$19
2025	$7	$19
2026	$7	$20
2027	$7	$20
2028	$7	$20
2029	$7	$21
2030	$7	$21
2031	$7	$22
2032	$8	$22
2033	$8	$22
2034	$8	$23
2035	$8	$23
2036	$8	$24
2037	$8	$24

[3] 4 CSR 240-22.045(2); 4 CSR 240-22.045(3)(A)3; 4 CSR 240-22.050(5)(A)1

Compliance References