

Overview of Wilmer 345/138 kV Switch

ERCOT RPG Meeting

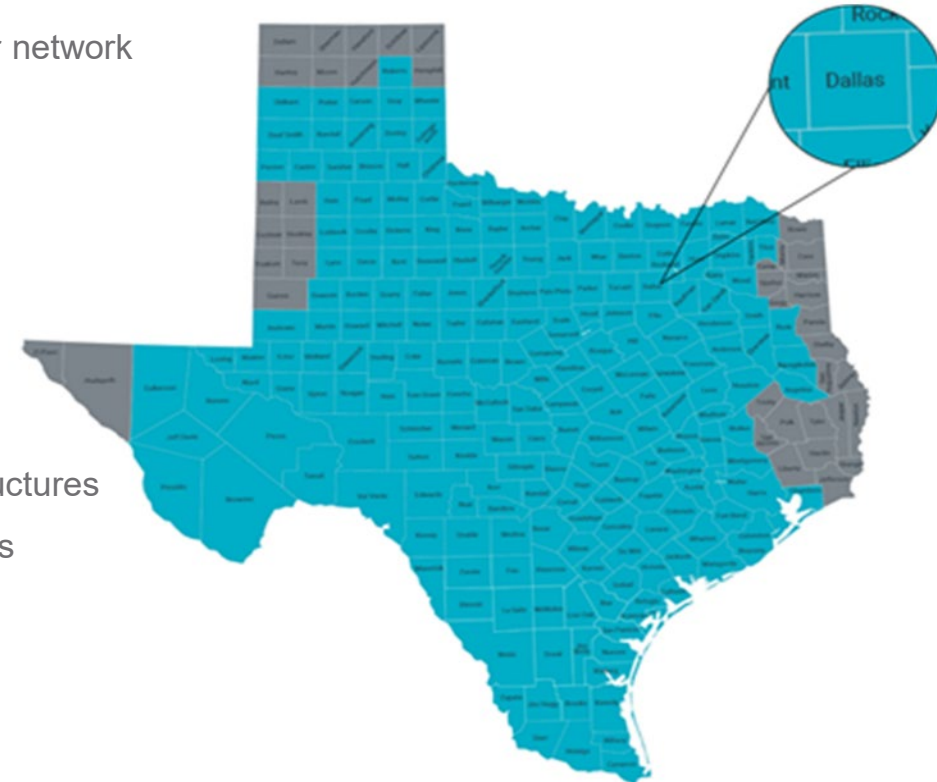
09/25/2024

Zahra Jianpanah

Project Overview



- Tier-1 Project in the Dallas County
- CCN Required
- Driven by a new 756 MW large load at Wilmer 138 kV Substation
- Resolves identified thermal violations, provide additional 345 kV sources for the area, further network the area's transmission facilities, and enhance system reliability
- New 345/138 kV Switch
 - 345 kV Switch: breaker and a half
 - 138 kV Switch: breaker and a half
 - Two new 345/138 kV Autotransformers rated at 750 MVA
 - Two new 110.4 Mvar 138 kV Capacitor Banks
- Two 2.4 miles of upgraded 345 kV transmission lines on two new separate double circuit structures
- Two 3.8 miles of new 345 kV transmission lines, each on the existing double circuit structures
- 4.3 miles of 138 kV transmission line upgrades on new double circuit structures
- 4.0 miles of 69 kV to 138 kV transmission line conversion
- 1 new 138/69 kV Switch by relocating an existing 138/69 kV Autotransformer
- Cost Estimate: \$158.2M

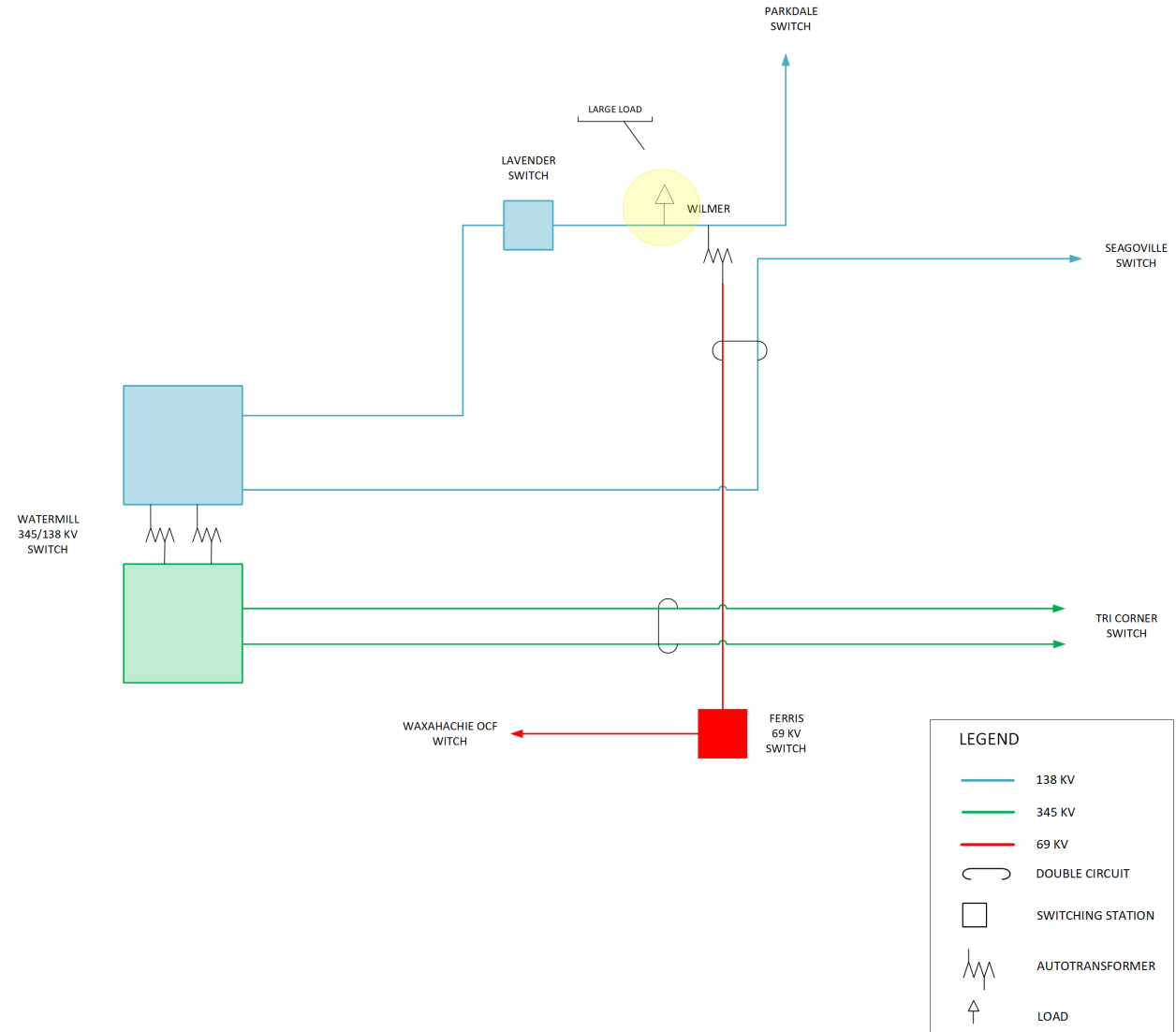


Pre-Project Thermal Violations



Pre-project Worst Post-Contingency Loading

Element	Contingency	Pre-Project Loading [% of Emergency Rating (Rate B)]		
		2026	2028	
Watermill 345/138 kV Autotransformer #1	Watermill 345/138 kV Autotransformer #2 & Seagoville Switch – Seagoville #1 138 kV Line Section	111	162	
Watermill 345/138 kV Autotransformer #2	Watermill 345/138 kV Autotransformer #1 & Seagoville Switch – Seagoville #1 138 kV Line Section	102	155	
Seagoville 345/138 kV Autotransformer #1	Forney 345/138 kV Autotransformer #1 & Watermill Switch – Wilmer 138 kV Line Section	95	142	
Seagoville Switch – Wilmer 138 kV Line Sections	Seagoville 345/138 kV Autotransformer #1 & Watermill Switch – Wilmer 138 kV Line Section	74	135	
Watermill Switch – Wilmer 138 kV Line Section	Seagoville 345/138 kV Autotransformer #1 & Mesquite East Switch – East Side Filtration Tap South 138 kV Line Section	88	139	
Wilmer 138/69 kV Autotransformer	Seagoville 345/138 kV Autotransformer #1 & Watermill Switch – Wilmer 138 kV Line Section	52	157	
Waxahachie OCF Switch – Waxahachie Switch 69 kV Line		72	116	
Wilmer Switch – Ferris Switch 69 kV Line		48	143	
Ferris Switch – Waxahachie OCF Switch 69 kV Line		95	208	
Sterrett Switch – Waxahachie OCF Switch 69 kV Line		88	166	
Sterrett 138/69 kV Autotransformer		85	163	
Mesquite East Switch – Lawson Road 138 kV Line Section		182	350	
Seagoville Switch – Kaufman Switch 138 kV Line		79	140	
Cedar Crest Switch – Simpson Stuart 138 kV Line Section		Watermill 345/138 kV Autotransformer #1 & Watermill 345/138 kV Autotransformer #2	75	110
Forney Switch – Mesquite East Switch 138 kV north circuit		Seagoville 345/138 kV Autotransformer #1 & Forney Switch – East Side Filtration Tap 138 kV Line Section	94	102
Forney Switch – East Side Filtration Tap 138 kV Line Section		Seagoville 345/138 kV Autotransformer #1 & Forney Switch – Mesquite East Switch 138 kV north circuit	94	102

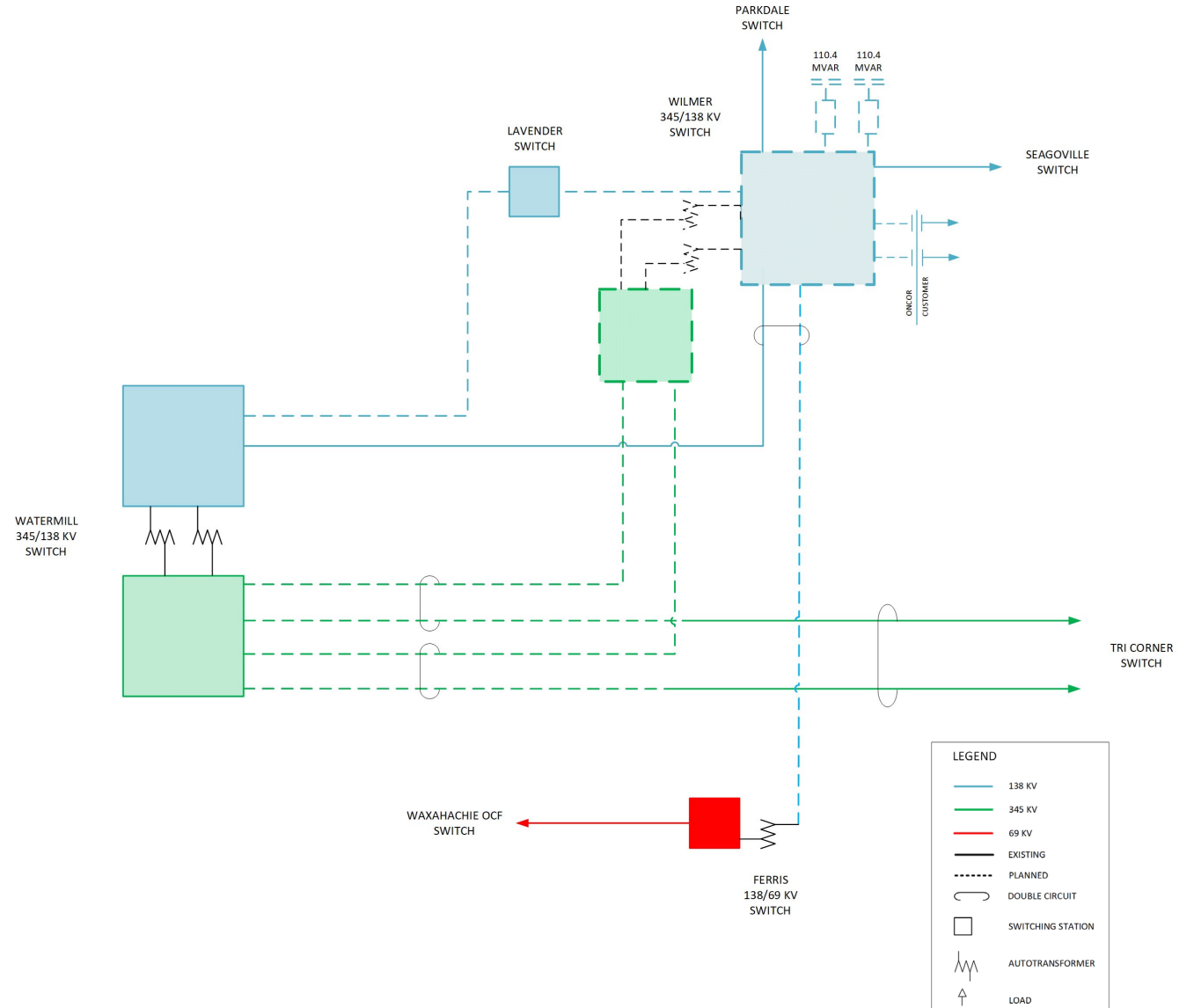


Post-Project Thermal Loading



Post-project Worst Post-Contingency Loading

Element	Contingency	Post Project Loading [% of Emergency Rating (Rate B)]	
		2026	2028
Watermill 345/138 kV Autotransformer #1	Watermill 345/138 kV Autotransformer #2 & Either of the Wilmer 345/138 kV Autotransformers	60	74
Watermill 345/138 kV Autotransformer #2	Watermill 345/138 kV Autotransformer #1 & Either of the Wilmer 345/138 kV Autotransformers	55	66
Seagoville 345/138 kV Autotransformer #1	Forney 345/138 kV Autotransformer #1 & Tri Corner Switch – Watermill Switch 345 kV Double-Circuit Line	85	89
Seagoville Switch – Wilmer 138 kV Line Sections	Either of the Wilmer 345/138 kV Autotransformers & Tri Corner Switch – Watermill Switch 345 kV Double-Circuit Line	42	49
Watermill Switch – Wilmer 138 kV Line Section	Wilmer 345/138 kV Autotransformer #1 & Wilmer 345/138 kV Autotransformer #2	26	42
Ferris 138/69 kV Autotransformer		60	60
Waxahachie OCF Switch – Waxahachie Switch 69 kV Line	Venus 345/138 kV Autotransformer #3 & Desoto Switch – Glen Height 138 kV Line Section	44	95
Wilmer Switch – Ferris Switch 138 kV Line		8	8
Ferris Switch – Waxahachie OCF Switch 69 kV Line		47	52
Sterrett Switch – Waxahachie OCF Switch 69 kV Line	Either of the Wilmer 345/138 kV Autotransformers & Ferris 138/69 kV Autotransformer	56	57
Sterrett 138/69 kV Autotransformer		53	55
Mesquite East Switch – Lawson Road 138 kV Line Section	Seagoville 345/138 kV Autotransformer #1 & Tri Corner Switch – Watermill Switch 345 kV Double-Circuit Line	76	84
Seagoville Switch – Kaufman Switch 138 kV Line	Forney Train #1 & Trinidad Switch – Nipak Tap 138 kV Line Section	56	56
Cedar Crest Switch – Simpson Stuart 138 kV Line Section	West Levee 345/138 kV Autotransformer #1 & Norwood Switch – Cedar Hill Switch/Liggett Switch 345 kV Double-Circuit Line	34	47
Forney Switch – Mesquite East Switch 138 kV north circuit	Seagoville 345/138 kV Autotransformer #1 & Forney Switch – East Side Filtration Tap 138 kV Line Section	85	87
Forney Switch – East Side Filtration Tap 138 kV Line Section	Seagoville 345/138 kV Autotransformer #1 & Forney Switch – Mesquite East Switch 138 kV north circuit	85	87



Oncor Recommendation

- Expand the existing Wilmer 138 kV Substation to establish the Wilmer 345/138 kV Switchyard by installing eight 345 kV, 5000 A breakers and fifteen 138 kV, 3200 A breakers in breaker-and-a-half bus arrangements
- Install two 345/138 kV autotransformers with nameplate rating of 600 MVA each
- Install two 110.4 MVAR 138 kV capacitor banks
- Rebuild the 2.4-mile portion of Watermill Switch – Tri Corner Switch 345 kV Double-Circuit Line with two separate double circuit structures starting from Watermill Switch using a conductor rated 5000 A (2988 MVA) or greater
- Install two 3.8-mile 345 kV circuits from Watermill Switch to Wilmer Switch on each of the existing Watermill Switch – Tri Corner Switch 345 kV double circuit structures using a conductor rated 5000 (2988 MVA) or greater
- Terminate the Lavender Switch – Parkdale Switch 138 kV Line to Wilmer 138 kV Switch
- Rebuild the 3.1-mile Watermill Switch – Lavender Switch 138 kV Line using a conductor rated 3200 A (764 MVA) or greater
- Rebuild the 1.2-mile Lavender Switch – Wilmer Switch 138 kV Line using a conductor rated 3200 A (764 MVA) or greater
- Convert the 4.0-mile Wilmer Switch – Ferris Switch 69 kV Line to 138 kV operation
- Relocate the existing Wilmer 138/69 kV Autotransformer to Ferris 69 kV Switch
- Ensure all line terminal and associated equipment elements are rated to meet or exceed 5000 A for 345 kV and 3200 A for 138 kV

Questions?

