

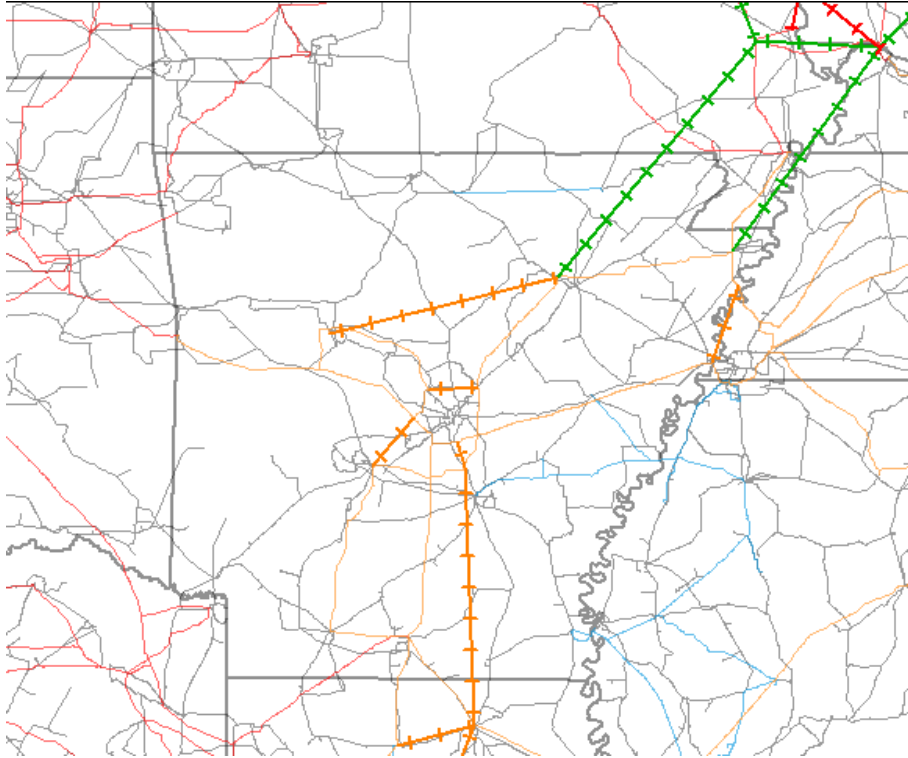


# MISO Regional Transmission Overlay Study Breakout Session – South Region Preliminary Overlay Results

**Economic Planning Users Group (EPUG)**

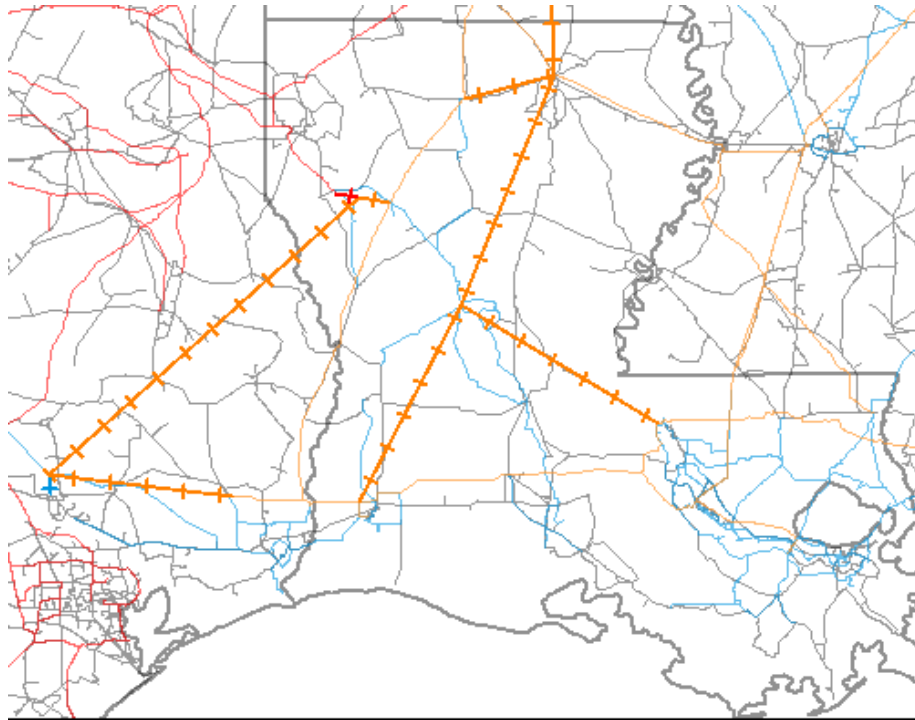
May 25, 2017

# May 25<sup>th</sup> AAT Overlay Updates South Region (1/2)



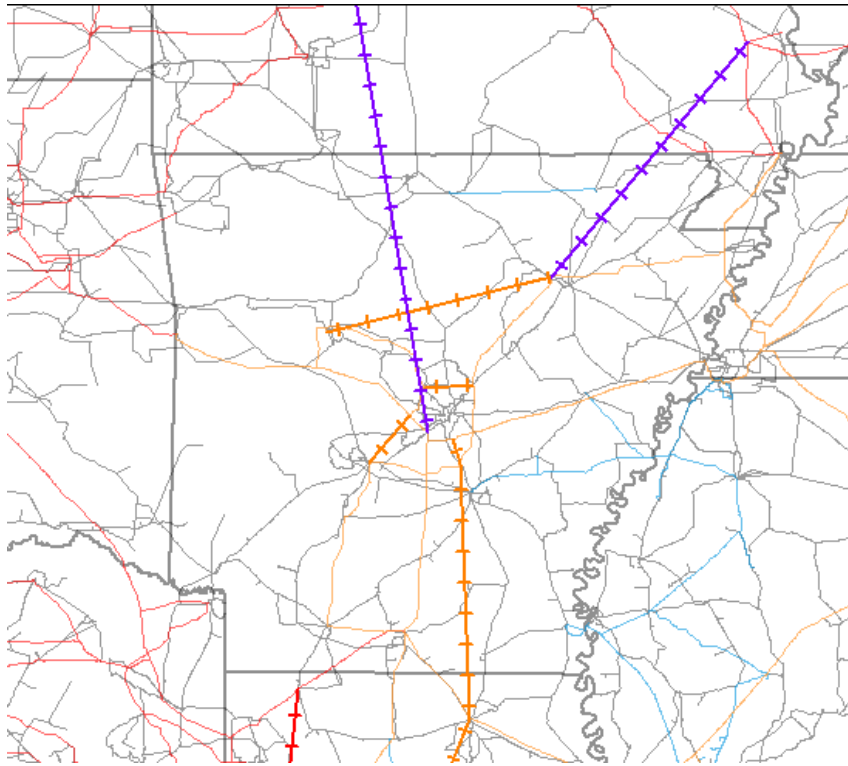
- Move the Lutesville – Mayflower 765 kV to Independence (R30)
- Add Independence – Arkansas Nuclear One (ANO) 500 kV (S43)
- Replace ANO – Hot Springs 500 kV (S2) with Happy Valley – Hot Springs 500 kV (S40)
- Replace Keo – Althiemer – Sheridan 500 kV (S4) & Althiemer – El Dorado (S5\_a) with Wrightsville – White Bluff 500 kV (S74) & White Bluff – Sterlington 500 kV (S76)

# May 25<sup>th</sup> AAT Overlay Updates South Region (2/2)



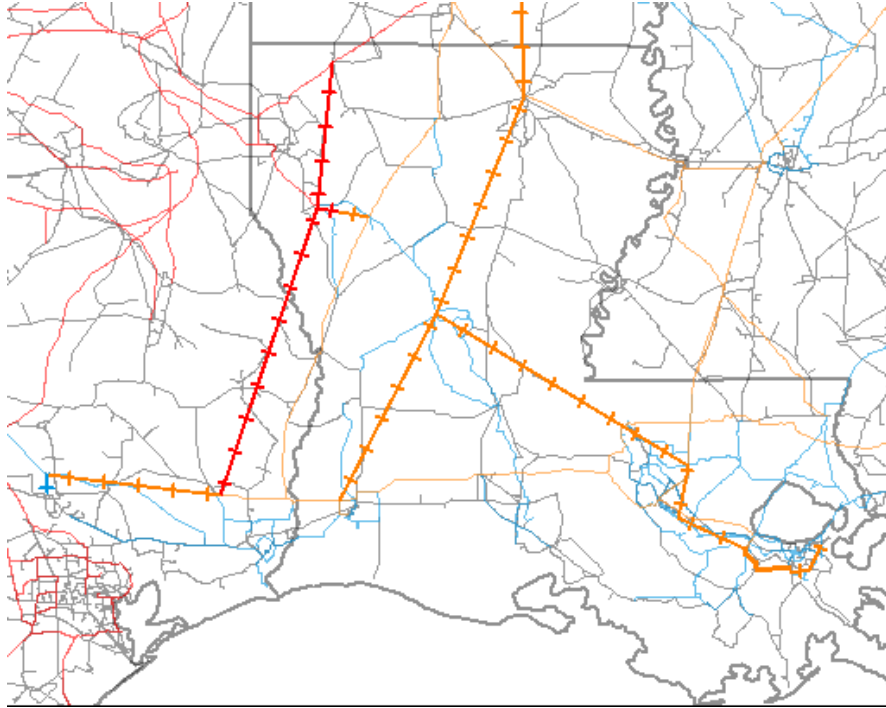
- Replace Mt. Olive – Richard 500 kV (S6) with Sterlington – Rodemacher – Rhodes 500 kV (S50)
- Add Rodemacher – Big Cajun 500 kV (S51)
- Remove Bogalusa tap on McKnight – Daniels & Michoud – Waterford (S11)

# May 25<sup>th</sup> PR Overlay Updates South Region (1/2)



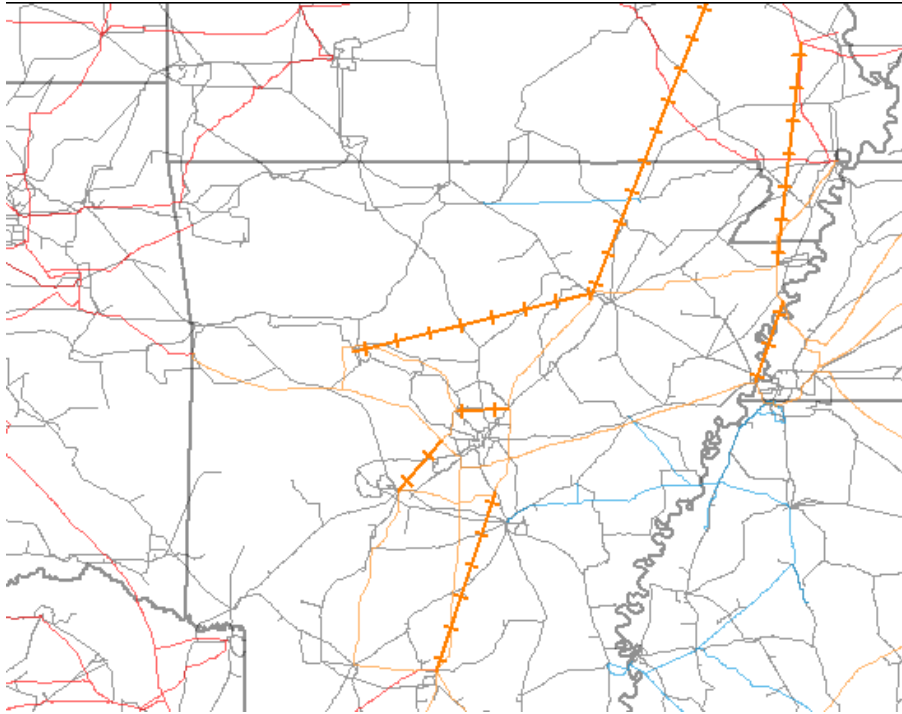
- Remove Lutesville – Dell 500 kV (R3)
- Add 1200 MW HVDC Lutesville – Independence (R37)
- Add 1200 MW HVDC Grimes – Mabelvale (R39)
- Add Independence – Arkansas Nuclear One (ANO) 500 kV (S43)
- Add Mayflower – Holland Bottoms 500 kV (S21)
- Add Wrightsville – White Bluff – Sterlington 500 kV (S74 & S75)

# May 25<sup>th</sup> PR Overlay Updates South Region (2/2)



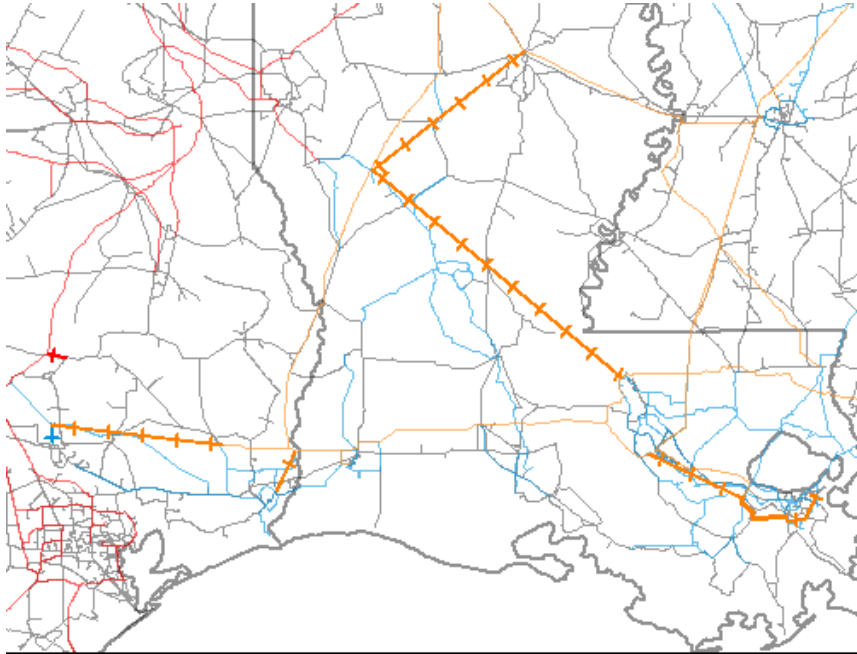
- Replace Sterlington – Richard 500 kV (S8) with Sterlington – Rodemacher – Rhodes 500 kV (S50)
- Add Rodemacher – Big Cajun – Coly – Conway – Waterford 500 kV (S41 & S51 & S81)
- Add Waterford – Churchill – Michoud 500 kV (S79 & S82)
- Remove McKnight/Daniels – Slidel (S10)

# May 25<sup>th</sup> EF Overlay Updates South Region (1/3)



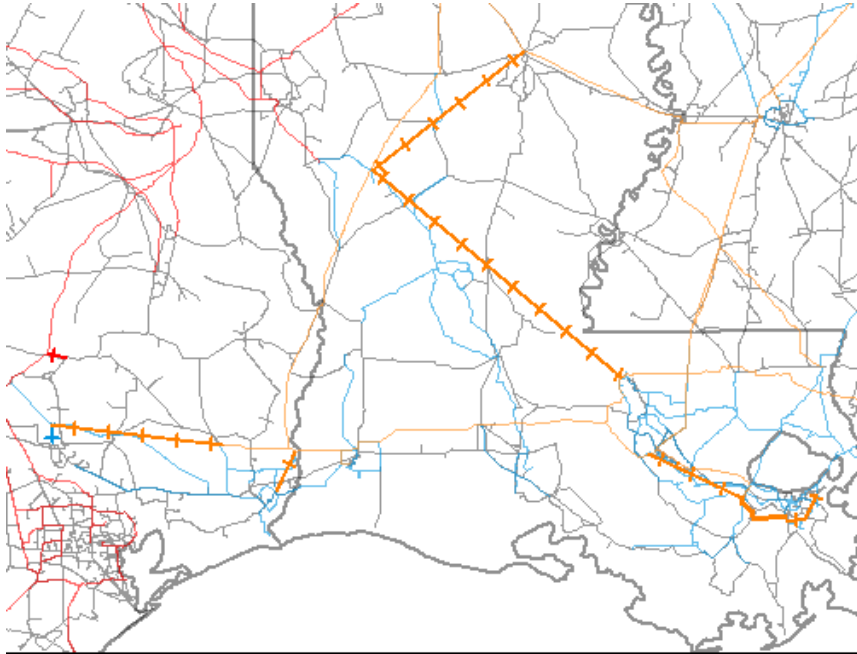
- Add Independence – Rush Island 500 kV (R34)
- Add Independence – Arkansas Nuclear One (ANO) 500 kV (S43)
- Replace Keo – El Dorado (S5\_b) with White Bluff – El Dorado (S75)

# May 25<sup>th</sup> EF Overlay Updates South Region (2/3)



- Add Hartburg – Sabine 500 kV (S37)
- Remove 230 kV Rivtrin – Hartburg/Layfield 500 kV tap (S34)
- Remove Layfield – Longwood/Sarepta 345 kV tap (S13)

# May 25<sup>th</sup> EF Overlay Updates South Region (3/3)



- Add Bayou Labutte – Waterford & Tap Conway 500 kV (S78 & S80)
- Add Waterford – Churchill – Michoud 500 kV (S79)
  - Note the Waterford – Churchill section will use one of the existing 230 kV circuits but it will be operated at 500 kV
- Remove Bogalusa tap on McKnight – Daniels & Michoud – Waterford (S11)





# Appendix

# South Region Overlay Design Analysis

	Scenario			Purpose
	Solution 1	Solution 2	Solution 3	
Base				For Comparison
Original Overlay				For Comparison
w/o R11 R13 (765 kV Connections)				Identify if helps ANO - Ft. Smith Constraints
w/o R13 (Lutesville - Mayflower)		+ Add S42 (Lutesville - ISES)		Sensitivity to R13
w/o R13 (Lutesville - Mayflower)		+ Add S42 (Lutesville - ISES)	+ Add S43 (ISES - ANO)	Sensitivity to R13
w/o R13 (Lutesville - Mayflower)		+ Add S42 (Lutesville - ISES)	+ Add S44 (ISES - Pleasant Hill)	Sensitivity to R13
w/o R13 (Lutesville - Mayflower)		+ Add S42 (Lutesville - ISES)	+ Add S45 (ISES - Mayflower)	Sensitivity to R13
w/o R13 (Lutesville - Mayflower) & S21 (Mayflower - Holland Bottoms)		+ Add S42 (Lutesville - ISES)	+ Add S43 (ISES - ANO)	Sensitivity to R13
w/o R13 (Lutesville - Mayflower) S2 (ANO - Hot Springs)		+ Add S42 & S43	+ Add S40 (Happy Valley)	Alternative
w/o S6 S7 S31 (Additional AR - LA 500 kV Lines)				Identify if helps ANO - Ft. Smith Constraints
w/o S2 (ANO - Hot Springs)				For Comparison
w/o S2 (ANO - Hot Springs)		+ Add S40 (Happy Valley)		Sensitivity to S2
w/o S9 (Lewis Creek - Cypress)				Sensitivity to S9
w/o S9 (Lewis Creek - Cypress)		+ Add S37 (Hartburg - Sabine)		Sensitivity to S9
w/o S31 (Lewis Creek - Layfield)				Sensitivity to S31
w/o S31 (Lewis Creek - Layfield)		+ Add S37 (Hartburg - Sabine)		Sensitivity to S31
w/o S31 (Lewis Creek - Layfield)		+ Add S37 (Hartburg - Sabine)	+ S77 (Lewis Creek - Sabine)	Sensitivity to S31
w/o S9 S31 (Lewis Creek 500 kV)				For Comparison
w/o S9 S31 (Lewis Creek 500 kV)		+ Add S38 & S39 (138 kV Upgrade)		Sensitivity to S9 S31
w/o S9 S31 (Lewis Creek 500 kV)		+ Add S37 (Hartburg - Sabine)		Sensitivity to S9 S31
w/o S9 S31 (Lewis Creek 500 kV)			+ Add S38 & S39 (138 kV Upgrade)	Sensitivity to S9 S31
w/o S11 (Slidell - Michoud - Waterford)		+ Add S37 (Hartburg - Sabine)	+ Upgrade)	For Comparison
w/o S11 (Slidell - Michoud - Waterford)		+ Add S41 (Big Cajun - Coly)		Sensitivity to S11
w/o S6 (Mt. Olive - Richard)				For Comparison
w/o S6 (Mt. Olive - Richard)		+ S46 (Mt. Olive - Rhodes)		Sensitivity to S6
w/o S6 (Mt. Olive - Richard)		+ S49 (Mt. Olive - Rodemacher - Rhodes)		Sensitivity to S6
w/o S6 (Mt. Olive - Richard)		+ S49 (Mt. Olive - Rodemacher - Rhodes)	+ S51 (Rodemacher - Big Cajun)	Sensitivity to S6
w/o S6 (Mt. Olive - Richard)		+ S47 (Sterlington - Rhodes)		Sensitivity to S6
w/o S6 (Mt. Olive - Richard)		+ S50 (Sterlington - Rodemacher - Rhodes)		Sensitivity to S6
w/o S6 (Mt. Olive - Richard)		+ S50 (Sterlington - Rodemacher - Rhodes)	+ S51 (Rodemacher - Big Cajun)	Sensitivity to S6
w/o S6 (Mt. Olive - Richard)		+ S48 (Mt. Olive - Cypress)		Sensitivity to S6
w/o S6 (Mt. Olive - Richard)		+ S52 (Mt. Olive - Dolay - Cypress)		Sensitivity to S6
w/o S11 S6 (Mt. Olive - Richard & Slidell - Michoud - Waterford)				For Comparison
w/o S11 S6 (Mt. Olive - Richard & Slidell - Michoud - Waterford)		+ S49 (Mt. Olive - Rodemacher - Rhodes)		Alternative
w/o S11 S6 (Mt. Olive - Richard & Slidell - Michoud - Waterford)		+ S49 (Mt. Olive - Rodemacher - Rhodes)	+ S51 (Rodemacher - Big Cajun)	Alternative
w/o S11 S6 (Mt. Olive - Richard & Slidell - Michoud - Waterford)			+ S51 S41 (Rodemacher - Big Cajun - Coly)	Alternative
w/o S11 S6 (Mt. Olive - Richard & Slidell - Michoud - Waterford)		+ S49 (Mt. Olive - Rodemacher - Rhodes)		For Comparison
w/o S9 S31 s6 s11 (Western, WOTAB & DSG 500 kV additions)				Alternative
w/o S9 S31 s6 s11 (Western, WOTAB & DSG 500 kV additions)		+ Add S37 S38 S39 (Hartburg - Sabine)	+ S49 S51 S41	Alternative
w/o S9 S31 s6 s11 (Western, WOTAB & DSG 500 kV additions)		+ Add S37 S38 S39 (Hartburg - Sabine)	+ S50 S51 S41	Alternative
w/o S4 S5a (Keo - Altheimer - El Dorado)				For Comparison
w/o S4 S5a (Keo - Altheimer - El Dorado)		+ S74 (White Bluff - Wrightsville)		Sensitivity to S4 S5a
w/o S4 S5a (Keo - Altheimer - El Dorado)		+ S75 (White Bluff - El Dorado)		Sensitivity to S4 S5a
w/o S4 S5a (Keo - Altheimer - El Dorado)		+ S76 (White Bluff - Sterlington)		Sensitivity to S4 S5a
w/o S4 S5a (Keo - Altheimer - El Dorado)		+ S74 (White Bluff - Wrightsville)	+ S75 (White Bluff - El Dorado)	Sensitivity to S4 S5a
w/o S4 S5a (Keo - Altheimer - El Dorado)		+ S74 (White Bluff - Wrightsville)	+ S76 (White Bluff - Sterlington)	Sensitivity to S4 S5a

- Since the last stakeholder meeting numerous sensitivities for each overlay were tested to evaluate their performance and improve the design
- For example in the AAT future over 40 different sensitivities were evaluated to guide the design of the AAT Overlay
- This iterative process focused primarily on reliability analysis as it can be completed faster and for the South there are more reliability issues than economic issues