

Summary of Joint Study Phase I Results

Plans	Plan 1		Cost
	Description		
	Install four 345 kV breakers in the Baldwin Switchyard for interconnection to Prairie State		\$ 6,600,000
	Build 26 miles of 345 kV line from the Baldwin Switchyard to the Rush Island Switchyard (Ameren)		\$ 22,000,000
	Install a new 345 kV breaker and line terminal in the Baldwin Switchyard for the Baldwin-Rush Island 345 kV line		\$ 850,000
	Install a new 345 kV line terminal in the Rush Island Switchyard for the Baldwin-Rush Island 345 kV line		\$ 1,300,000
	Build a four breaker 345 kV Prairie State Switchyard and build 15 miles of double circuit 345 kV line to the Baldwin Switchyard		\$ 21,000,000
Required Reinforcements	Reason	Loading as a % of Emergency Rating	Cost
Replace breakers 4556, 4560 and 4564 and associated equipment with 3000 amp equipment. Replace terminal equipment on Line 4511 with 3000 amp equipment	The Cahokia-Baldwin 345 kV line is overloaded for NERC TPL-002 (1)	110.3	\$ 3,050,000
Replace terminal equipment on Line 4511 with 3000 amp equipment			
Install a new 345/138 kV 560 MVA transformer, 345 kV breaker and 138 kV breaker in the Stallings Substation			
Reconductor 7 miles of the 138 kV Line 1452 from the Stallings Substation to Madison Industrial Substation			
Reconductor 5 miles of the 138 kV Line 1432 between Porter Road Substation and the Highland Tap			
Upgrade a switch and wave trap on the 138 kV Line 1472 terminal at the East Belleville Substation			
Build 24 miles of 345 kV line from the Turkey Hill Substation to the Stallings Substation. Upgrade terminal equipment at the Turkey Hill substation with 3000 amp equipment. Replace terminal equipment and Breaker 4592 in the Baldwin Switchyard on Line 4521 with 3000 amp equipment. Upgrade Baldwin-Stallings 345 kV line terminal equipment and breaker with 3000 amp equipment and install three new 345 kV breakers at the Stallings Substation			
Install a new 345/138 kV 560 MVA transformer and 138 kV breaker in Stallings Substation			
Reconductor 5 miles of 138 kV Line 1452A from the Stallings Substation to 1452A tap			
Increase ground clearances for the Sioux-Huster-1 138 kV line			
Increase ground clearances for the Sioux-Huster-3 138 kV line			
Add a second Dupo 345/138 kV transformer			
Reconductor the Effingham-Newton 138 kV line	(2)		
Replace the Cahokia 345/138 kV Transformer # 8			
Increase clearances on the Cahokia-North Coulterville 230 kV Line			
Total Costs			\$ 54,800,000

(1) Ameren and IP single contingency criteria is similar to NERC TPL-002

(2) Costs Added in Phase I

Summary of Joint Study Phase I Results

Plans	Plan 2		
	Description		Cost
	Install four 345 kV breakers in the Baldwin Switchyard for interconnection to Prairie State		\$ 6,600,000
	Build 28 miles of 345 KV line from the Baldwin Switchyard to Dupo Substation (Ameren)		\$ 23,700,000
	Install a new 345 kV breaker and line terminal in the Baldwin Switchyard for the Baldwin-Dupo 345 kV line		\$ 850,000
	Install a new 345 kV line terminal in the Dupo Substation for the Baldwin-Dupo 345 kV line		\$ 1,300,000
	Build a four breaker 345 KV Prairie State Switchyard and build 15 miles of double circuit 345 kV line to the Baldwin Switchyard		\$ 21,000,000
		Loading as a % of Emergency Rating	
Required Reinforcements	Reason		Cost
Replace breakers 4556, 4560 and 4564 and associated equipment with 3000 amp equipment. Replace terminal equipment on Line 4511 with 3000 amp equipment			
Replace terminal equipment on Line 4511 with 3000 amp equipment	The Cahokia-Baldwin 345 kV line is overloaded for NERC TPL-002 (1)	105.3	\$ 350,000
Install a new 345/138 kV 560 MVA transformer, 345 kV breaker and 138 kV breaker in the Stallings Substation			
Reconductor 7 miles of the 138 kV Line 1452 from the Stallings Substation to Madison Industrial Substation			
Reconductor 5 miles of the 138 kV Line 1432 between Porter Road Substation and the Highland Tap			
Upgrade a switch and wave trap on the 138 kV Line 1472 terminal at the East Belleville Substation			
Build 24 miles of 345 kV line from the Turkey Hill Substation to the Stallings Substation. Upgrade terminal equipment at the Turkey Hill substation with 3000 amp equipment. Replace terminal equipment and Breaker 4592 in the Baldwin Switchyard on Line 4521 with 3000 amp equipment. Upgrade Baldwin-Stallings 345 kV line terminal equipment and breaker with 3000 amp equipment and install three new 345 kV breakers at the Stallings Substation			
Install a new 345/138 kV 560 MVA transformer and 138 kV breaker in Stallings Substation			
Reconductor 5 miles of 138 kV Line 1452A from the Stallings Substation to 1452A tap			
Increase ground clearances for the Sioux-Huster-1 138 kV line	Sioux-Huster-1 138 kV line is overloaded for NERC TPL-002 (1)	107.7	\$ 2,600,000
Increase ground clearances for the Sioux-Huster-3 138 kV line	Sioux-Huster-3 138 kV line is overloaded for NERC TPL-002 (1)	104.9	\$ 2,600,000
Add a second Dupo 345/138 kV transformer	Dupo 345/138 kV transformer is overloaded for First Contingency Incremental Transfer Capability of 1800 MW	107.9	\$ 5,680,500
Reconductor the Effingham-Newton 138 kV line			
Replace the Cahokia 345/138 kV Transformer # 8			
Increase clearances on the Cahokia-North Coulterville 230 kV Line			
Total Costs			\$ 64,680,500

(1) Ameren and IP single contingency criteria

(2) Costs Added in Phase I

Summary of Joint Study Phase I Results

Plans	Plan 3		
	Description		Cost
	Install four 345 kV breakers in the Baldwin Switchyard for interconnection to Prairie State		\$ 6,600,000
	Build 47 miles of 345 kV line from the Baldwin Switchyard to the Stallings Substation		\$ 40,000,000
	Install a new 345 kV breaker and line terminal in the Baldwin Switchyard for the Baldwin-Stallings 345 kV line		\$ 850,000
	Upgrade Baldwin-Stallings 345 kV line terminal and breaker to 3000 amp capability and install two new 345 kV breakers at the Stallings Substation		\$ 5,800,000
	Build a four breaker 345 kV Prairie State Switchyard and build 15 miles of double circuit 345 kV line to the Baldwin Switchyard		\$ 21,000,000
		Loading as a % of Emergency Rating	
Required Reinforcements	Reason		Cost
Replace breakers 4556, 4560 and 4564 and associated equipment with 3000 amp equipment. Replace terminal equipment on Line 4511 with 3000 amp equipment	The Cahokia-Baldwin 345 kV line is overloaded for NERC TPL-002 (1)	107.1	\$ 3,050,000
Replace terminal equipment on Line 4511 with 3000 amp equipment			
Install a new 345/138 kV 560 MVA transformer, 345 kV breaker and 138 kV breaker in the Stallings Substation	The Stallings 345/138 kV transformer & Roxford-Stallings 345 kV line are overloaded for NERC TPL-002 (1)	128.4 118.4	\$ 4,000,000
Reconductor 7 miles of the 138 kV Line 1452 from the Stallings Substation to Madison Industrial Substation	The Stallings-1452A Tap 138 kV line is overloaded for NERC TPL-002 (1)	111.4	\$ 2,600,000
Reconductor 5 miles of the 138 kV Line 1432 between Porter Road Substation and the Highland Tap			
Upgrade a switch and wave trap on the 138 kV Line 1472 terminal at the East Belleville Substation			
Build 24 miles of 345 kV line from the Turkey Hill Substation to the Stallings Substation. Upgrade terminal equipment at the Turkey Hill substation with 3000 amp equipment. Replace terminal equipment and Breaker 4592 in the Baldwin Switchyard on Line 4521 with 3000 amp equipment. Upgrade Baldwin-Stallings 345 kV line terminal equipment and breaker with 3000 amp equipment and install three new 345 kV breakers at the Stallings Substation			
Install a new 345/138 kV 560 MVA transformer and 138 kV breaker in Stallings Substation			
Reconductor 5 miles of 138 kV Line 1452A from the Stallings Substation to 1452A tap			
Increase ground clearances for the Sioux-Huster-1 138 kV line	Sioux-Huster-1 138 kV line is overloaded for NERC TPL-002 (1)	107.7	\$ 2,600,000
Increase ground clearances for the Sioux-Huster-3 138 kV line	Sioux-Huster-3 138 kV line is overloaded for NERC TPL-002 (1)	105.6	\$ 2,600,000
Add a second Dupo 345/138 kV transformer			
Reconductor the Effingham-Newton 138 kV line			
Replace the Cahokia 345/138 kV Transformer # 8			
Increase clearances on the Cahokia-North Coulterville 230 kV Line			
Total Costs			\$ 89,100,000

(1) Ameren and IP single contingency criteria

(2) Costs Added in Phase I

Summary of Joint Study Phase I Results

Plans	Plan 4		
	Description		Cost
	Install four 345 kV breakers in the Baldwin Switchyard for interconnection to Prairie State		\$ 6,600,000
	Build 21 miles of 345 kV line from Baldwin Switchyard to the Turkey Hill Substation		\$ 18,000,000
	Convert the 138 kV Line 1492 between Turkey Hill and Cahokia to 345 kV		\$ 4,200,000
	Install a new 345 kV breaker and line terminal in the Baldwin Switchyard for the Baldwin-Turkey Hill-Cahokia 345 kV line		\$ 850,000
	Install a new 345 kV line terminal in the Cahokia Substation for the Baldwin-Turkey Hill-Cahokia 345 kV line		\$ 1,300,000
	Build a four breaker 345 kV Prairie State Switchyard and build 15 miles of double circuit 345 kV line to the Baldwin Switchyard		\$ 21,000,000
		Loading as a % of Emergency Rating	
Required Reinforcements	Reason		Cost
Replace breakers 4556, 4560 and 4564 and associated equipment with 3000 amp equipment. Replace terminal equipment on Line 4511 with 3000 amp equipment	The Cahokia-Baldwin 345 kV line is overloaded for NERC TPL-002 (1)	111.1	\$ 3,050,000
Replace terminal equipment on Line 4511 with 3000 amp equipment.			
Install a new 345/138 kV 560 MVA transformer, 345 kV breaker and 138 kV breaker in the Stallings Substation			
Reconductor 7 miles of the 138 kV Line 1452 from the Stallings Substation to Madison Industrial Substation			
Reconductor 5 miles of the 138 kV Line 1432 between Porter Road Substation and the Highland Tap	The Porter Road-Highland Tap 138 kV line is overloaded for NERC TPL-002 (1)	102.2	\$ 1,100,000
Upgrade a switch and wave trap on the 138 kV Line 1472 terminal at the East Belleville Substation	The Turkey Hill-East Belleville 138 kV line is overloaded for NERC TPL-002 (1)	104.5	\$ 60,000
Build 24 miles of 345 kV line from the Turkey Hill Substation to the Stallings Substation. Upgrade terminal equipment at the Turkey Hill substation with 3000 amp equipment. Replace terminal equipment and Breaker 4592 in the Baldwin Switchyard on Line 4521 with 3000 amp equipment. Upgrade Baldwin-Stallings 345 kV line terminal equipment and breaker with 3000 amp equipment and install three new 345 kV breakers at the Stallings Substation			
Install a new 345/138 kV 560 MVA transformer and 138 kV breaker in Stallings Substation			
Reconductor 5 miles of 138 kV Line 1452A from the Stallings Substation to 1452A tap			
Increase ground clearances for the Sioux-Huster-1 138 kV line	Sioux-Huster-1 138 kV line is overloaded for NERC TPL-002 (1)	107.7	\$ 2,600,000
Increase ground clearances for the Sioux-Huster-3 138 kV line	Sioux-Huster-3 138 kV line is overloaded for NERC TPL-002 (1)	105.1	\$ 2,600,000
Add a second Dupo 345/138 kV transformer			
Reconductor the Effingham-Newton 138 kV line	Effingham-Newton 138 kV line is overloaded for NERC TPL-003	101.0	\$ 5,020,000
Replace the Cahokia 345/138 kV Transformer # 8	Cahokia 345/138 kV Transformer #8 is overloaded for First Contingency Incremental Transfer Capability of 1800 MW	102.1	\$ 2,200,000
Increase clearances on the Cahokia-North Couteville 230 kV Line			
Total Costs			\$ 68,580,000

(1) Ameren and IP single contingency criteri

(2) Costs Added in Phase I

Summary of Joint Study Phase I Results

Plans	Plan 5		Cost
	Description		
	Install four 345 kV breakers in the Baldwin Switchyard for interconnection to Prairie State		\$ 6,600,000
	Build 50 miles of 345 kV line from the Baldwin Switchyard to the W. Mt. Vernon Substation		\$ 43,000,000
	Install a new 345 kV breaker and line terminal in the W. Mt. Vernon Substation for the Baldwin-W. Mt. Vernon 345 kV line		\$ 850,000
	Install a new 345 kV breaker and line terminal in the Baldwin Switchyard for the Baldwin-W. Mt. Vernon 345 kV line		\$ 850,000
	Build a four breaker 345 kV Prairie State Switchyard and build 15 miles of double circuit 345 kV line to the Baldwin Switchyard		\$ 21,000,000
Required Reinforcements	Reason	Loading as a % of Emergency Rating	Cost
Replace breakers 4556, 4560 and 4564 and associated equipment with 3000 amp equipment. Replace terminal equipment on Line 4511 with 3000 amp equipment	The Cahokia-Baldwin 345 kV line is overloaded for NERC TPL-002 (1)	143.3	\$ 3,050,000
Replace terminal equipment on Line 4511 with 3000 amp equipment.			
Install a new 345/138 kV 560 MVA transformer, 345 kV breaker and 138 kV breaker in the Stallings Substation			
Reconductor 7 miles of the 138 kV Line 1452 from the Stallings Substation to Madison Industrial Substation			
Reconductor 5 miles of the 138 kV Line 1432 between Porter Road Substation and the Highland Tap			
Upgrade a switch and wave trap on the 138 kV Line 1472 terminal at the East Belleville Substation			
Build 24 miles of 345 kV line from the Turkey Hill Substation to the Stallings Substation. Upgrade terminal equipment at the Turkey Hill substation with 3000 amp equipment. Replace terminal equipment and Breaker 4592 in the Baldwin Switchyard on Line 4521 with 3000 amp equipment. Upgrade Baldwin-Stallings 345 kV line terminal equipment and breaker with 3000 amp equipment and install three new 345 kV breakers at the Stallings Substation	The Baldwin-Cahokia 345 kV line, Baldwin-Stallings 345 kV line, Turkey Hill-East Belleville 138 kV line, Porter Road-High Tap 138 kV line & Turkey Hill 345/138 kV transformer are overloaded for NERC TPL-002 (1)	143.3 123.4 120.8 112.3 102.5	\$ 28,450,000
Install a new 345/138 kV 560 MVA transformer and 138 kV breaker in Stallings Substation	The Stallings 345/138 kV transformer is overloaded for NERC TPL-002 (1)	107.0	\$ 3,400,000
Reconductor 5 miles of 138 kV Line 1452A from the Stallings Substation to 1452A tap	The Stallings-1452A Tap 138 kV line is overloaded for NERC TPL-002 (1)	103.9	\$ 1,400,000
Increase ground clearances for the Sioux-Huster-1 138 kV line	Sioux-Huster-1 138 kV line is overloaded for NERC TPL-002 (1)	107.2	\$ 2,600,000
Increase ground clearances for the Sioux-Huster-3 138 kV line	Sioux-Huster-3 138 kV line is overloaded for NERC TPL-002 (1)	105.2	\$ 2,600,000
Add a second Dupo 345/138 kV transformer			
Reconductor the Effingham-Newton 138 kV line			
Replace the Cahokia 345/138 kV Transformer # 8			
Increase clearances on the Cahokia-North Coulterville 230 kV Line			
Total Costs			\$ 113,800,000

(1) Ameren and IP single contingency criteria

(2) Costs Added in Phase I

Summary of Joint Study Phase I Results

Plans	Plan 6M		Cost
	Description		
	Build a nine breaker 345 kV Prairie State Switchyard in a breaker and a half arrangement		\$ 12,500,000
	Build 7.4 miles of double circuit 345 kV line from the Line 4531 tap to the Prairie State Switchyard		\$ 13,200,000
	Build 1.3 miles of double circuit 345 kV line from Line 4541 tap to the Prairie State Switchyard		\$ 2,200,000
	Build 26 miles of 345 kV line from the Baldwin Switchyard to the Rush Island Switchyard (Ameren)		\$ 22,000,000
	Install two new 345 kV breakers and line terminal at the Baldwin Switchyard for the Baldwin-Rush Island 345 kV line		\$ 3,300,000
	Install a new 345 kV line terminal in the Rush Island Switchyard for the Baldwin-Rush Island 345 kV line		\$ 1,300,000
Required Reinforcements	Reason	Loading as a % of Emergency Rating	Cost
Replace breakers 4556, 4560 and 4564 and associated equipment with 3000 amp equipment. Replace terminal equipment on Line 4511 with 3000 amp equipment	The Cahokia-Baldwin 345 kV line is overloaded for NERC TPL-002 (1)	108.0	\$ 3,050,000
Replace terminal equipment on Line 4511 with 3000 amp equipment			
Install a new 345/138 kV 560 MVA transformer, 345 kV breaker and 138 kV breaker in the Stallings Substation			
Reconductor 7 miles of the 138 kV Line 1452 from the Stallings Substation to Madison Industrial Substation			
Reconductor 5 miles of the 138 kV Line 1432 between Porter Road Substation and the Highland Tap			
Upgrade a switch and wave trap on the 138 kV Line 1472 terminal at the East Belleville Substation			
Build 24 miles of 345 kV line from the Turkey Hill Substation to the Stallings Substation. Upgrade terminal equipment at the Turkey Hill substation with 3000 amp equipment. Replace terminal equipment and Breaker 4592 in the Baldwin Switchyard on Line 4521 with 3000 amp equipment. Upgrade Baldwin-Stallings 345 kV line terminal equipment and breaker with 3000 amp equipment and install three new 345 kV breakers at the Stallings Substation			
Install a new 345/138 kV 560 MVA transformer and 138 kV breaker in Stallings Substation			
Reconductor 5 miles of 138 kV Line 1452A from the Stallings Substation to 1452A tap			
Increase ground clearances for the Sioux-Huster-1 138 kV line			
Increase ground clearances for the Sioux-Huster-3 138 kV line			
Add a second Dupo 345/138 kV transformer			
Reconductor the Effingham-Newton 138 kV line	(2)		
Replace the Cahokia 345/138 kV Transformer # 8	(2)		
Increase clearances on the Cahokia-North Coulterville 230 kV Line	(2)		
Total Costs			\$ 57,550,000

(1) Ameren and IP single contingency criteria

(2) Costs Added in Phase I