



DPA-2025-DECEMBER-2263

Delivery Point Network Study

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By SPP Engineering, Transmission Services

REVISION HISTORY

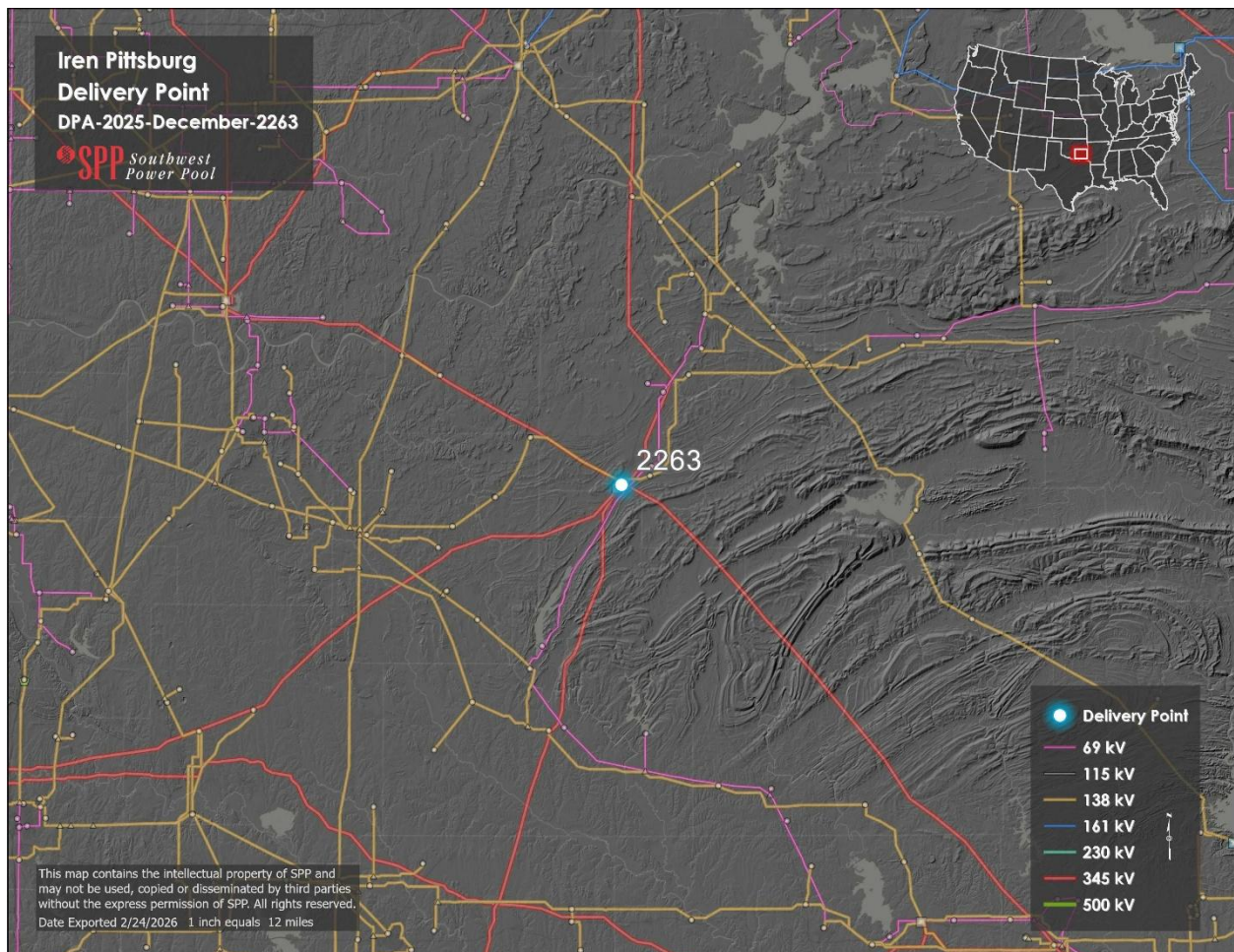
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SECTION 1: INTRODUCTION

This report outlines the results of an evaluation of regional transmission impacts from delivery point request DPA-2025-December-2263. The requesting entity plans to add new load to the existing delivery point called Pittsburg with an in-service date of 9/30/2031. The Pittsburg delivery point is in the American Electric Power (AEP) Transmission System.



The load flow models used for the evaluation were 2025 Integrated Transmission Planning (ITP) base reliability models. Southwest Power Pool (SPP) performed an Alternating Current (AC) contingency analysis on these models using PSS@E.

SECTION 2: STUDY METHODOLOGY

OBJECTIVE

The purpose of this study was to determine the regional Transmission System impacts within the SPP footprint due to the new load served by AEP. SPP performed a Delivery Point Network Study (DPNS) with the configurations shown in Table 2-1 below.

STUDY PROCESS

- Model Assumptions
 - 2025 ITP Base Reliability Model Series
 - Model years 2029 and 2034 (2029 as a sensitivity for 2031)
 - Summer Peak (2029S and 2034S), Winter Peak (2029W and 2034W), and Light Load (2029L and 2034L)
 - 2025 ITP Short Circuit Model Series
 - 2029 Summer Max Fault
 - 2025 Transmission System Planning (TPL) Dynamic Model Series
 - 2034 Summer Peak Base and Change Cases
- Aggregate Kiowa generation dispatch per model
 - 2029L: 0 MW
 - 2029S: 270.8 MW
 - 2029W: 0 MW
 - 2034L: 0 MW
 - 2034S: 1343.6 MW
 - 2034W: 0 MW

Table 2-1: Study Cases

Case Name	Study Year	Season	Scenario	Load (MW/MVAR)
2025ITPFinal-29L.sav	2029	Light Load	Base Reliability	Pittsburg = 600/150.37
2025ITPFinal-29S.sav	2029	Summer Peak	Base Reliability	Pittsburg = 600/150.37
2025ITPFinal-29W.sav	2029	Winter Peak	Base Reliability	Pittsburg = 600/150.37
2025ITPFinal-34L.sav	2034	Light Load	Base Reliability	Pittsburg = 600/150.37
2025ITPFinal-34S.sav	2034	Summer Peak	Base Reliability	Pittsburg = 600/150.37
2025ITPFinal-34W.sav	2034	Winter Peak	Base Reliability	Pittsburg = 600/150.37
2025ITPFinal-29L_2263.sav	2029	Light Load	Base Reliability	Pittsburg = 1600/353.4
2025ITPFinal-29S_2263.sav	2029	Summer Peak	Base Reliability	Pittsburg = 1600/353.4
2025ITPFinal-29W_2263.sav	2029	Winter Peak	Base Reliability	Pittsburg = 1600/353.4
2025ITPFinal-34L_2263.sav	2034	Light Load	Base Reliability	Pittsburg = 1600/353.4
2025ITPFinal-34S_2263.sav	2034	Summer Peak	Base Reliability	Pittsburg = 1600/353.4
2025ITPFinal-34W_2263.sav	2034	Winter Peak	Base Reliability	Pittsburg = 1600/353.4

Steady State Analysis

- Assumptions (consistent with the ITP analysis)
 - AC contingency analysis on all load flow models using PSS@E
 - Monitored Elements
 - SPP facilities 69 kV and above
 - First-tier companies 100 kV and above
 - Contingencies (consistent with the ITP analysis)
 - Provided for the ITP by SPP members and first-tier companies
 - Apply SPP Criteria and National American Electric Reliability Corporation (NERC) reliability standards
- Compare thermal and voltage violations that occur with and without the Pittsburgh delivery point change to determine thermal and voltage violations resulting from the load addition to the Transmission System.
- Dynamics Analysis
 - Assumptions
 - 2025 TPL Dynamics Model Series
 - 2034 Summer Peak Base and Change Cases
 - Analyses
 - Fast Fault Screening using Physical and Operational Margins Studio
- Short Circuit Analysis
 - Assumptions
 - Used 2024 Final ITP Short Circuit models (Max Fault)
 - Placed all available facilities in service
 - Generation
 - Transmission lines
 - Transformers
 - Buses
 - Short Circuit Output
 - Physical
 - Short Circuit Coordinates
 - Polar
 - Short Circuit Parameters
 - 3 Phase
 - FLAT – classical fault analysis conditions
 - Analyses
 - Three-phase fault

SECTION 3: RESULTS OF ANALYSIS

POTENTIAL THERMAL AND VOLTAGE VIOLATIONS

The analysis identified potential thermal and voltage violations resulting from the new load at the Pittsburg delivery point. Table 3-1 details the potential thermal violations and Table 3-2 details the potential voltage violations resulting from the load addition. Contingency name, "267474" and "267471" are the listed names for the contingencies below:

CONTINGENCY '267474' /'P23:345:AEPW:PITTSBURG CB 3441A NBTB:

TRIP BRANCH FROM BUS 510907 TO BUS 515045 CIRCUIT 1

TRIP BRANCH FROM BUS 510907 TO BUS 515422 CIRCUIT 1

CONTINGENCY '267471' /'P23:345:AEPW:PITTSBURG CB 3425A NBTB:

TRIP BRANCH FROM BUS 510907 TO BUS 510911 CIRCUIT 1

TRIP BRANCH FROM BUS 510907 TO BUS 515422 CIRCUIT 1

Table 3-1: Potential Thermal Violations

Model	Voltage Level (kV)	Facility Name	Contingency Name	Rate A, Rate B (MVA)	Max Flow (MVA)	Change Case Max Loading (%)
29L	345	PITTSB-7-SEMINOL7-1	267471	956/956	1283.908	134.3
29L	345	PITTSB-7-SEMINOL7-1	P23:345:AEPW:PITTSBURG CB 3429A NBTB TRIP BRANCH FROM BUS 510907 TO BUS 510911 CIRCUIT 1 TRIP BRANCH FROM BUS 510907 TO BUS 514809 CIRCUIT 1	956/956	1148.156	120.1
29L	345	PITTSB-7-SEMINOL7-1	P42:345:OKGE:SB_CRER7309:::EHV: OPEN BRANCH FROM BUS 510946 TO BUS 510947 TO BUS 515422 CKT 1 OPEN BRANCH FROM BUS 510907 TO BUS 515422 CKT 1	956/956	1121.388	117.3
29L	345	PITTSB-7-SEMINOL7-1	PITTSB-7 - C-RIVER7 - 1	956/956	1118.52	117
29L	345	PITTSB-7-SEMINOL7-1	C-RIVER7 - PITTSB-7 - 1	956/956	1118.52	117
29L	345	PITTSB-7-SEMINOL7-1	C-RIVER7 - RAVEN 7 - 1	956/956	1066.896	111.6
29L	345	PITTSB-7-SEMINOL7-1	P42:345:AEPW:TERRYRD_CB_3421A_NBTB: OPEN LINE FROM BUS 511568 TO BUS 511571 CKT 1 OPEN LINE FROM BUS 511568 TO BUS 515136 CKT 1	956/956	1052.556	110.1
29L	345	PITTSB-7-SEMINOL7-1	TERRYRD7 - SUNNYS7 - 1	956/956	1052.556	110.1
29L	345	PITTSB-7-SEMINOL7-1	SUNNYS7 - TERRYRD7 - 1	956/956	1052.556	110.1
29S	345	PITTSB-7-SEMINOL7-1	P23:345:AEPW:PITTSBURG CB 3425A NBTB: TRIP BRANCH FROM BUS 510907 TO BUS	956/956	1283.908	134.3

Model	Voltage Level (kV)	Facility Name	Contingency Name	Rate A, Rate B (MVA)	Max Flow (MVA)	Change Case Max Loading (%)
			510911 CIRCUIT 1 TRIP BRANCH FROM BUS 510907 TO BUS 515422 CIRCUIT 1			
29W	345	PITTSB-7-SEMINOL7-1	P23:345:AEPW:PITTSBURG CB 3425A NBTB: TRIP BRANCH FROM BUS 510907 TO BUS 510911 CIRCUIT 1 TRIP BRANCH FROM BUS 510907 TO BUS 515422 CIRCUIT 1	956/956	1426.352	149.2
29W	345	PITTSB-7-SEMINOL7-1	P23:345:AEPW:PITTSBURG CB 3429A NBTB: TRIP BRANCH FROM BUS 510907 TO BUS 510911 CIRCUIT 1 TRIP BRANCH FROM BUS 510907 TO BUS 514809 CIRCUIT 1	956/956	1095.576	114.6
29W	138	PARKLN4-LKKONWA4-1	TRIP BRANCH FROM BUS 510907 TO BUS 515045 CIRCUIT 1 P23:345:AEPW:PITTSBURG CB 3441A NBTB:....' TRIP BRANCH FROM BUS 510907 TO BUS 515045 CIRCUIT 1 TRIP BRANCH FROM BUS 510907 TO BUS 515422 CIRCUIT 1	379/382	420.964	110.2
29W	345	PITTSB-7-SEMINOL7-1	C-RIVER7 - PITTSB-7 - 1	956/956	1039.172	108.7
29W	345	PITTSB-7-SEMINOL7-1	PITTSB-7 - C-RIVER7 - 1	956/956	1039.172	108.7
29W	345	PITTSB-7-SEMINOL7-1	C-RIVER7 - RAVEN 7 - 1	956/956	1018.14	106.5
34L	345	PITTSB-7-SEMINOL7-1	P23:345:AEPW:PITTSBURG CB 3425A NBTB: TRIP BRANCH FROM BUS 510907 TO BUS 510911 CIRCUIT 1 TRIP BRANCH FROM BUS 510907 TO BUS 515422 CIRCUIT 1	956/956	1376.64	144
34L	345	PITTSB-7-SEMINOL7-1	P42:345:AEPW:PITTSBURG CB 3429A NBTB+FAULT: TRIP BRANCH FROM BUS 510907 TO BUS 510911 CIRCUIT 1 TRIP BRANCH FROM BUS 510907 TO BUS 514809 CIRCUIT 1	956/956	1195.956	125.1
34L	345	PITTSB-7-SEMINOL7-1	C-RIVER7 - PITTSB-7 - 1	956/956	1108.004	115.9
34L	345	PITTSB-7-SEMINOL7-1	PITTSB-7 - C-RIVER7 - 1	956/956	1108.004	115.9
34L	345	PITTSB-7-SEMINOL7-1	C-RIVER7 - RAVEN 7 - 1	956/956	1050.644	109.9
34L	345	PITTSB-7-SEMINOL7-1	SUNNYS7 - TERRYRD7 - 1	956/956	1034.392	108.2
34L	345	PITTSB-7-SEMINOL7-1	TERRYRD7 - SUNNYS7 - 1	956/956	1034.392	108.2
34L	345	PITTSB-7-SEMINOL7-1	L.E.S.-7 - TERRYRD7 - 1	956/956	1033.436	108.1
34W	345	PITTSB-7-SEMINOL7-1	P23:345:AEPW:PITTSBURG CB 3425A NBTB: TRIP BRANCH FROM BUS 510907 TO BUS 510911 CIRCUIT 1	956/956	1412.968	147.8

Model	Voltage Level (kV)	Facility Name	Contingency Name	Rate A, Rate B (MVA)	Max Flow (MVA)	Change Case Max Loading (%)
			TRIP BRANCH FROM BUS 510907 TO BUS 515422 CIRCUIT 1			
34W	345	PITTSB-7-SEMINOL7-1	P23:345:AEPW:PITTSBURG CB 3429A NBTB: TRIP BRANCH FROM BUS 510907 TO BUS 510911 CIRCUIT 1 TRIP BRANCH FROM BUS 510907 TO BUS 514809 CIRCUIT 1	956/956	1086.016	113.6
34W	345	PITTSB-7-SEMINOL7-1	PITTSB-7 - C-RIVER7 - 1	956/956	1011.448	105.8
34W	345	PITTSB-7-SEMINOL7-1	C-RIVER7 - PITTSB-7 - 1	956/956	1011.448	105.8
34W	345	PITTSB-7-SEMINOL7-1	C-RIVER7 - RAVEN 7 - 1	956/956	991.372	103.7
34W	138	PARKLN4-LKKONWA4-1	TRIP BRANCH FROM BUS 510907 TO BUS 515045 CIRCUIT 1 P23:345:AEPW:PITTSBURG CB 3441A NBTB::::' TRIP BRANCH FROM BUS 510907 TO BUS 515045 CIRCUIT 1 TRIP BRANCH FROM BUS 510907 TO BUS 515422 CIRCUIT 1	379/382	388.876	101.8

Table 3-2: Potential Voltage Violations

Model	Facility Name	Facility Voltage (kV)	Contingency Name	Voltage Maximum (pu)	Voltage Minimum (pu)	Bus Voltage (pu)
29W	ALLEN 4	138	267474	1.05	0.9	0.86889
29W	TUPELO 4	138	267474	1.05	0.9	0.82197
29W	S BROWN4	138	267474	1.05	0.9	0.62784
29W	DENISON4	138	267474	1.05	0.9	0.62836
29W	BRKN BW4	138	267474	1.05	0.9	0.83811
29W	GERTY 4	138	267474	1.05	0.9	0.86994
29W	BARITE-RD 4	138	267474	1.05	0.9	0.86719
29W	DEQUEEN4	138	267474	1.05	0.9	0.84404
29W	SDIERKS4	138	267474	1.05	0.9	0.86804
29W	MENA 4	138	267474	1.05	0.9	0.81258
29W	POTRTP 4	138	267474	1.05	0.9	0.81317
29W	BARITERDTP 4	138	267474	1.05	0.9	0.86806
29W	V-WEYCO1 4	138	267474	1.05	0.9	0.72839
29W	COALGAT4	138	267474	1.05	0.9	0.81882
29W	ALLENNG4	138	267474	1.05	0.9	0.82056
29W	B.BOW 4	138	267474	1.05	0.9	0.80835
29W	V-WEYCO T4	138	267474	1.05	0.9	0.72864

Model	Facility Name	Facility Voltage (kV)	Contingency Name	Voltage Maximum (pu)	Voltage Minimum (pu)	Bus Voltage (pu)
29W	COALGTP4	138	267474	1.05	0.9	0.81886
29W	ALLENGT4	138	267474	1.05	0.9	0.82181
29W	IDABEL-4	138	267474	1.05	0.9	0.77876
29W	ATOKA--4	138	267474	1.05	0.9	0.81612
29W	B.BOWTP4	138	267474	1.05	0.9	0.80871
29W	CRAIGJT4	138	267474	1.05	0.9	0.8264
29W	LEHIGH-4	138	267474	1.05	0.9	0.81769
29W	HUGO---4	138	267474	1.05	0.9	0.74648
29W	ALLEN--4	138	267474	1.05	0.9	0.86889
29W	VALIANT4	138	267474	1.05	0.9	0.73553
29W	BETHEL 4	138	267474	1.05	0.9	0.87021
29W	EXPCOLT4	138	267474	1.05	0.9	0.82102
29W	EXPCOLG4	138	267474	1.05	0.9	0.821
29W	WAPANUCKA 4	138	267474	1.05	0.9	0.8228
29W	V-WEYCO2 4	138	267474	1.05	0.9	0.72802
29W	PERNELL4	138	267474	1.05	0.9	0.74041
29W	JOHNCO 4	138	267474	1.05	0.9	0.60959
29W	PRICESF4	138	267474	1.05	0.9	0.72713
29W	PAOLI- 4	138	267474	1.05	0.9	0.85371
29W	CHIGLEY4	138	267474	1.05	0.9	0.79022
29W	ARBUCKL4	138	267474	1.05	0.9	0.75935
29W	JOLLYVL4	138	267474	1.05	0.9	0.73271
29W	RUSSET-4	138	267474	1.05	0.9	0.61975
29W	MILLCKT4	138	267474	1.05	0.9	0.65292
29W	SXMLCKT4	138	267474	1.05	0.9	0.64891
29W	OAKLAW-4	138	267474	1.05	0.9	0.76381
29W	MAYSVIL4	138	267474	1.05	0.9	0.80458
29W	RATLIFF4	138	267474	1.05	0.9	0.71921
29W	POOLVIL4	138	267474	1.05	0.9	0.70952
29W	FOX 4	138	267474	1.05	0.9	0.70086
29W	DUNDEE 4	138	267474	1.05	0.9	0.68858
29W	BLUERIV4	138	267474	1.05	0.9	0.81059
29W	PRARPNT4	138	267474	1.05	0.9	0.74286
29W	SUNNYSD4	138	267474	1.05	0.9	0.6786
29W	UNIROY 4	138	267474	1.05	0.9	0.67714
29W	CARTER 4	138	267474	1.05	0.9	0.68138
29W	HLTNTAP4	138	267474	1.05	0.9	0.68454
29W	DILLARD4	138	267474	1.05	0.9	0.67935
29W	WOLFCRK4	138	267474	1.05	0.9	0.67846
29W	LONEGRV4	138	267474	1.05	0.9	0.67834
29W	GLASSES4	138	267474	1.05	0.9	0.61274
29W	MADINDT4	138	267474	1.05	0.9	0.61283

Model	Facility Name	Facility Voltage (kV)	Contingency Name	Voltage Maximum (pu)	Voltage Minimum (pu)	Bus Voltage (pu)
29W	CANEYCK4	138	267474	1.05	0.9	0.62179
29W	LTLCTY4	138	267474	1.05	0.9	0.62419
29W	BROWNT4	138	267474	1.05	0.9	0.62674
29W	COLEMNT4	138	267474	1.05	0.9	0.62619
29W	EXPLRPL4	138	267474	1.05	0.9	0.6244
29W	BODLE 4	138	267474	1.05	0.9	0.61245
29W	BROWN 4	138	267474	1.05	0.9	0.62751
29W	MADLIND4	138	267474	1.05	0.9	0.61192
29W	COLBRT4	138	267474	1.05	0.9	0.61375
29W	AIRPARK4	138	267474	1.05	0.9	0.69035
29W	FNDTION4	138	267474	1.05	0.9	0.6713
29W	ROCKYPT4	138	267474	1.05	0.9	0.66898
29W	TOTAL 4	138	267474	1.05	0.9	0.67631
29W	AIRPRKT4	138	267474	1.05	0.9	0.69155
29W	CHIKSAW4	138	267474	1.05	0.9	0.67528
29W	SPRNDAL4	138	267474	1.05	0.9	0.66456
29W	BERWYN 4	138	267474	1.05	0.9	0.69291
29W	VANOSS 4	138	267474	1.05	0.9	0.86507
29W	BUTRFLD4	138	267474	1.05	0.9	0.61119
29W	PARKLN 4	138	267474	1.05	0.9	0.8796
29W	LULA 4	138	267474	1.05	0.9	0.82882
29W	COLBRT-4	138	267474	1.05	0.9	0.61065
29W	MILLCRK4	138	267474	1.05	0.9	0.6525
29W	SOTHADA4	138	267474	1.05	0.9	0.86818
29W	HARDEN 4	138	267474	1.05	0.9	0.84449
29W	BLUEBRD4	138	267474	1.05	0.9	0.64882
29W	ARDWEST4	138	267474	1.05	0.9	0.67754
29W	REBAR 4	138	267474	1.05	0.9	0.61065
29W	CHEEKTP4	138	267474	1.05	0.9	0.67828
29W	VANOSTP4	138	267474	1.05	0.9	0.86484
29W	SULPHR 4	138	267474	1.05	0.9	0.75675
29W	CARTRCO4	138	267474	1.05	0.9	0.71025
29W	ORIGINW4	138	267474	1.05	0.9	0.71918
29W	KEYSTNT4	138	267474	1.05	0.9	0.64897
29W	MAYSVLT4	138	267474	1.05	0.9	0.79278
29W	ARBWIND4	138	267474	1.05	0.9	0.71779
29W	HONEYCK4	138	267474	1.05	0.9	0.71778
29W	EFITSTP4	138	267474	1.05	0.9	0.83925
29W	EFITTS 4	138	267474	1.05	0.9	0.83924
29W	DRSPRG4	138	267474	1.05	0.9	0.65983
29W	STIRLNG4	138	267474	1.05	0.9	0.65258
29W	SALTCRK4	138	267474	1.05	0.9	0.85281
29W	STRRDTP4	138	267474	1.05	0.9	0.62735

Model	Facility Name	Facility Voltage (kV)	Contingency Name	Voltage Maximum (pu)	Voltage Minimum (pu)	Bus Voltage (pu)
29W	MAGNOLI4	138	267474	1.05	0.9	0.61068
29W	12MILE 4	138	267474	1.05	0.9	0.64013
29W	LOVECO 4	138	267474	1.05	0.9	0.66666
29W	GLSSAND4	138	267474	1.05	0.9	0.75972
29W	ROCKHVN4	138	267474	1.05	0.9	0.72424
29W	TUPELO 4	138	267474	1.05	0.9	0.82395
29W	SAWYER4	138	267474	1.05	0.9	0.73297
29W	GARVIN4	138	267474	1.05	0.9	0.77794
29W	SEAWAY4	138	267474	1.05	0.9	0.6094
29W	TXI4	138	267474	1.05	0.9	0.60905
29W	YUBA4	138	267474	1.05	0.9	0.60872
29W	MAYSVLL4	138	267474	1.05	0.9	0.79276
29W	KRSEY1_4	138	267474	1.05	0.9	0.61552
29W	BOGYDPT4	138	267474	1.05	0.9	0.81867
29W	MRIETA 4	138	267474	1.05	0.9	0.65961
29W	SCOLEMN4	138	267474	1.05	0.9	0.62894
29W	REAGAN 4	138	267474	1.05	0.9	0.61669
29W	HAWORTH4	138	267474	1.05	0.9	0.79477
29W	ENOSJCT4	138	267474	1.05	0.9	0.62011
29W	OWENSPR4	138	267474	1.05	0.9	0.84561
29W	SPECTRM4	138	267474	1.05	0.9	0.83681
29W	DURANT 4	138	267474	1.05	0.9	0.63744
29W	HEALDTN4	138	267474	1.05	0.9	0.76445
29W	LEBANON4	138	267474	1.05	0.9	0.63412
29W	OILCNTR4	138	267474	1.05	0.9	0.84188
29W	WSTBANK4	138	267474	1.05	0.9	0.691
29W	ENVILLE4	138	267474	1.05	0.9	0.64537
29W	BOGGYDP4	138	267474	1.05	0.9	0.81779
29W	TC_PEC 4	138	267474	1.05	0.9	0.83249
29W	TCPECTP4	138	267474	1.05	0.9	0.83252
29W	SALTTP 4	138	267474	1.05	0.9	0.85282
29W	HUGOITC4	138	267474	1.05	0.9	0.72163
29W	MAYVL2 4	138	267474	1.05	0.9	0.79274
29W	ARCO 4	138	267474	1.05	0.9	0.83847
29W	ASHLAND4	138	267474	1.05	0.9	0.86786
29W	BASELIN4	138	267474	1.05	0.9	0.84646
29W	HOCHJCT4	138	267474	1.05	0.9	0.82016
29W	BENNGTN4	138	267474	1.05	0.9	0.65254
29W	BROKNBW4	138	267474	1.05	0.9	0.81231
29W	CIVIT 4	138	267474	1.05	0.9	0.87948
29W	COLBERT4	138	267474	1.05	0.9	0.61064
29W	COLGATE4	138	267474	1.05	0.9	0.84187
29W	COMANCH4	138	267474	1.05	0.9	0.86575

Model	Facility Name	Facility Voltage (kV)	Contingency Name	Voltage Maximum (pu)	Voltage Minimum (pu)	Bus Voltage (pu)
29W	DARWIN 4	138	267474	1.05	0.9	0.77151
29W	DOMINAN4	138	267474	1.05	0.9	0.81692
29W	DURANTP4	138	267474	1.05	0.9	0.63819
29W	ENOS 4	138	267474	1.05	0.9	0.61684
29W	FROGVIL4	138	267474	1.05	0.9	0.70964
29W	CHAHTA 4	138	267474	1.05	0.9	0.8371
29W	HLDTNTP4	138	267474	1.05	0.9	0.76515
29W	HOCHTWN4	138	267474	1.05	0.9	0.83148
29W	HOLYCRK4	138	267474	1.05	0.9	0.80341
29W	HUGO PP4	138	267474	1.05	0.9	0.72296
29W	IDABEL 4	138	267474	1.05	0.9	0.7959
29W	KRSEY2_4	138	267474	1.05	0.9	0.61552
29W	LANE 4	138	267474	1.05	0.9	0.80292
29W	LASALLE4	138	267474	1.05	0.9	0.83086
29W	LATTA 4	138	267474	1.05	0.9	0.83621
29W	LATTAJT4	138	267474	1.05	0.9	0.83803
29W	LEBANTP4	138	267474	1.05	0.9	0.63464
29W	LOCO 4	138	267474	1.05	0.9	0.82533
29W	MARIETA4	138	267474	1.05	0.9	0.66622
29W	MTRIVER4	138	267474	1.05	0.9	0.82561
29W	OILCRTP4	138	267474	1.05	0.9	0.84454
29W	OAKLAWN4	138	267474	1.05	0.9	0.76381
29W	PINTO 4	138	267474	1.05	0.9	0.83684
29W	RATTAN 4	138	267474	1.05	0.9	0.7451
29W	RINGLNG4	138	267474	1.05	0.9	0.75103
29W	RUSSETT4	138	267474	1.05	0.9	0.61974
29W	SCLMNJC4	138	267474	1.05	0.9	0.63049
29W	SOLOCUP4	138	267474	1.05	0.9	0.83534
29W	STRATFD4	138	267474	1.05	0.9	0.85632
29W	SWILSON4	138	267474	1.05	0.9	0.7091
29W	TEXOMA 4	138	267474	1.05	0.9	0.61812
29W	TEXOMAJ4	138	267474	1.05	0.9	0.62197
29W	STNWLSW4	138	267474	1.05	0.9	0.82432
29W	BOGGY4	138	267474	1.05	0.9	0.82205
29W	STNWLTP4	138	267474	1.05	0.9	0.82527
29W	UNGER 4	138	267474	1.05	0.9	0.67086
29W	VALLANT4	138	267474	1.05	0.9	0.74349
29W	WSBNKTP4	138	267474	1.05	0.9	0.69195
29W	BENNSUB4	138	267474	1.05	0.9	0.65159
29W	HOWE 4	138	267474	1.05	0.9	0.6489
29W	GOLDENSW4	138	267474	1.05	0.9	0.81563
29W	DOMINJCT4	138	267474	1.05	0.9	0.81717

Model	Facility Name	Facility Voltage (kV)	Contingency Name	Voltage Maximum (pu)	Voltage Minimum (pu)	Bus Voltage (pu)
29W	GEN-2017-023	138	267474	1.05	0.9	0.72296
34L	JOHNCO 4	138	267471	1.05	0.9	0.86804
34L	SXMLCKT4	138	267471	1.05	0.9	0.87895
34L	HOWE 4	138	267471	1.05	0.9	0.87895
34S	BLUEBRD4	138	BASE CASE	1.05	0.95	0.94311
34S	KEYSTNT4	138	BASE CASE	1.05	0.95	0.94323
34S	BENNGTN4	138	BASE CASE	1.05	0.95	0.94651
34S	UNGER 4	138	BASE CASE	1.05	0.95	0.94563
34S	BENNSUB4	138	BASE CASE	1.05	0.95	0.94562
34W	BARITE-RD 4	138	267474	1.05	0.9	0.86418
34W	DEQUEEN4	138	267474	1.05	0.9	0.84622
34W	SDIERKS4	138	267474	1.05	0.9	0.86507
34W	MENA 4	138	267474	1.05	0.9	0.81334
34W	POTRTP 4	138	267474	1.05	0.9	0.81407
34W	BARITERDTP 4	138	267474	1.05	0.9	0.8651
34W	V-WEYCO1 4	138	267474	1.05	0.9	0.72442
34W	COALGAT4	138	267474	1.05	0.9	0.81207
34W	ALLENNG4	138	267474	1.05	0.9	0.8135
34W	B.BOW 4	138	267474	1.05	0.9	0.81057
34W	V-WEYCO T4	138	267474	1.05	0.9	0.72468
34W	COALGTP4	138	267474	1.05	0.9	0.8121
34W	ALLENGT4	138	267474	1.05	0.9	0.81477
34W	IDABEL-4	138	267474	1.05	0.9	0.77864
34W	ATOKA--4	138	267474	1.05	0.9	0.80968
34W	B.BOWTP4	138	267474	1.05	0.9	0.81093
34W	CRAIGJT4	138	267474	1.05	0.9	0.82997
34W	LEHIGH-4	138	267474	1.05	0.9	0.81105
34W	HUGO---4	138	267474	1.05	0.9	0.74222
34W	ALLEN--4	138	267474	1.05	0.9	0.8629
34W	VALIANT4	138	267474	1.05	0.9	0.73162
34W	BETHEL 4	138	267474	1.05	0.9	0.87628
34W	EXPCOLT4	138	267474	1.05	0.9	0.81397
34W	EXPCOLG4	138	267474	1.05	0.9	0.81394
34W	WAPANUCKA 4	138	267474	1.05	0.9	0.81574
34W	V-WEYCO2 4	138	267474	1.05	0.9	0.72405
34W	PERNELL4	138	267474	1.05	0.9	0.73768
34W	JOHNCO 4	138	267474	1.05	0.9	0.6017
34W	PRICESF4	138	267474	1.05	0.9	0.72062
34W	PAOLI- 4	138	267474	1.05	0.9	0.84998
34W	CHIGLEY4	138	267474	1.05	0.9	0.78766

Model	Facility Name	Facility Voltage (kV)	Contingency Name	Voltage Maximum (pu)	Voltage Minimum (pu)	Bus Voltage (pu)
34W	ARBUCKL4	138	267474	1.05	0.9	0.75393
34W	JOLLYVL4	138	267474	1.05	0.9	0.72643
34W	RUSSET-4	138	267474	1.05	0.9	0.60991
34W	MILLCKT4	138	267474	1.05	0.9	0.64645
34W	SXMLCKT4	138	267474	1.05	0.9	0.64235
34W	OAKLAW-4	138	267474	1.05	0.9	0.75882
34W	MAYSVIL4	138	267474	1.05	0.9	0.80134
34W	RATLIFF4	138	267474	1.05	0.9	0.71681
34W	POOLVIL4	138	267474	1.05	0.9	0.70531
34W	FOX 4	138	267474	1.05	0.9	0.69642
34W	DUNDEE 4	138	267474	1.05	0.9	0.68374
34W	BLUERIV4	138	267474	1.05	0.9	0.80426
34W	PRARPNT4	138	267474	1.05	0.9	0.74013
34W	SUNNYSD4	138	267474	1.05	0.9	0.66993
34W	UNIROY 4	138	267474	1.05	0.9	0.66837
34W	CARTER 4	138	267474	1.05	0.9	0.67267
34W	HLTNTAP4	138	267474	1.05	0.9	0.67956
34W	DILLARD4	138	267474	1.05	0.9	0.6729
34W	WOLFCRK4	138	267474	1.05	0.9	0.67099
34W	LONEGRV4	138	267474	1.05	0.9	0.6701
34W	GLASSES4	138	267474	1.05	0.9	0.60292
34W	MADINDT4	138	267474	1.05	0.9	0.60303
34W	CANEYCK4	138	267474	1.05	0.9	0.61123
34W	LTLCITY4	138	267474	1.05	0.9	0.61268
34W	BROWNT4	138	267474	1.05	0.9	0.61489
34W	COLEMNT4	138	267474	1.05	0.9	0.61432
34W	EXPLRPL4	138	267474	1.05	0.9	0.61251
34W	BODLE 4	138	267474	1.05	0.9	0.59989
34W	BROWN 4	138	267474	1.05	0.9	0.61567
34W	MADLIND4	138	267474	1.05	0.9	0.60231
34W	COLBRTP4	138	267474	1.05	0.9	0.60119
34W	AIRPARK4	138	267474	1.05	0.9	0.68226
34W	FNDTION4	138	267474	1.05	0.9	0.66214
34W	ROCKYPT4	138	267474	1.05	0.9	0.6592
34W	TOTAL 4	138	267474	1.05	0.9	0.66748
34W	AIRPRKT4	138	267474	1.05	0.9	0.68356
34W	CHIKSAW4	138	267474	1.05	0.9	0.66627
34W	SPRNDAL4	138	267474	1.05	0.9	0.65524
34W	BERWYN 4	138	267474	1.05	0.9	0.68499
34W	VANOSS 4	138	267474	1.05	0.9	0.85705
34W	BUTRFLD4	138	267474	1.05	0.9	0.59845
34W	PARKLN 4	138	267474	1.05	0.9	0.87142
34W	LULA 4	138	267474	1.05	0.9	0.82197

Model	Facility Name	Facility Voltage (kV)	Contingency Name	Voltage Maximum (pu)	Voltage Minimum (pu)	Bus Voltage (pu)
34W	COLBRT-4	138	267474	1.05	0.9	0.59783
34W	MILLCRK4	138	267474	1.05	0.9	0.64601
34W	SOTHADA4	138	267474	1.05	0.9	0.86041
34W	HARDEN 4	138	267474	1.05	0.9	0.83752
34W	BLUEBRD4	138	267474	1.05	0.9	0.63743
34W	ARDWEST4	138	267474	1.05	0.9	0.66877
34W	REBAR 4	138	267474	1.05	0.9	0.59795
34W	CHEEKTP4	138	267474	1.05	0.9	0.67022
34W	VANOSTP4	138	267474	1.05	0.9	0.85681
34W	SULPHR 4	138	267474	1.05	0.9	0.75125
34W	CARTRCO4	138	267474	1.05	0.9	0.70606
34W	ORIGINW4	138	267474	1.05	0.9	0.715
34W	KEYSTNT4	138	267474	1.05	0.9	0.63759
34W	MAYSVLT4	138	267474	1.05	0.9	0.78967
34W	ARBWIND4	138	267474	1.05	0.9	0.71086
34W	HONEYCK4	138	267474	1.05	0.9	0.71085
34W	EFITSTP4	138	267474	1.05	0.9	0.8324
34W	EFITTS 4	138	267474	1.05	0.9	0.83239
34W	DRSPRG4	138	267474	1.05	0.9	0.65038
34W	STIRLNG4	138	267474	1.05	0.9	0.64305
34W	SALTCRK4	138	267474	1.05	0.9	0.84675
34W	STRDTP4	138	267474	1.05	0.9	0.6155
34W	MAGNOLI4	138	267474	1.05	0.9	0.59795
34W	12MILE 4	138	267474	1.05	0.9	0.62805
34W	LOVECO 4	138	267474	1.05	0.9	0.65523
34W	GLSSAND4	138	267474	1.05	0.9	0.7543
34W	ROCKHVN4	138	267474	1.05	0.9	0.71997
34W	TUPELO 4	138	267474	1.05	0.9	0.81696
34W	SAWYER4	138	267474	1.05	0.9	0.72757
34W	GARVIN4	138	267474	1.05	0.9	0.77833
34W	SEAWAY4	138	267474	1.05	0.9	0.59657
34W	TXI4	138	267474	1.05	0.9	0.59621
34W	YUBA4	138	267474	1.05	0.9	0.59587
34W	MAYSVLL4	138	267474	1.05	0.9	0.78966
34W	KRSEY1_4	138	267474	1.05	0.9	0.60308
34W	BOGYDPT4	138	267474	1.05	0.9	0.812
34W	MRIETA 4	138	267474	1.05	0.9	0.64784
34W	SCOLEMN4	138	267474	1.05	0.9	0.61704
34W	REAGAN 4	138	267474	1.05	0.9	0.60682
34W	HAWORTH4	138	267474	1.05	0.9	0.79684
34W	ENOSJCT4	138	267474	1.05	0.9	0.60937
34W	OWENSPR4	138	267474	1.05	0.9	0.84365
34W	SPECTRM4	138	267474	1.05	0.9	0.83378

Model	Facility Name	Facility Voltage (kV)	Contingency Name	Voltage Maximum (pu)	Voltage Minimum (pu)	Bus Voltage (pu)
34W	DURANT 4	138	267474	1.05	0.9	0.62561
34W	HEALDTN4	138	267474	1.05	0.9	0.75517
34W	LEBANON4	138	267474	1.05	0.9	0.6229
34W	OILCNTR4	138	267474	1.05	0.9	0.83502
34W	WSTBANK4	138	267474	1.05	0.9	0.6828
34W	ENVILLE4	138	267474	1.05	0.9	0.63387
34W	BOGGYDP4	138	267474	1.05	0.9	0.8111
34W	TC_PEC 4	138	267474	1.05	0.9	0.82577
34W	TCPECTP4	138	267474	1.05	0.9	0.8258
34W	SALTTP 4	138	267474	1.05	0.9	0.84675
34W	HUGOITC4	138	267474	1.05	0.9	0.71649
34W	MAYVL2 4	138	267474	1.05	0.9	0.78964
34W	ARCO 4	138	267474	1.05	0.9	0.83548
34W	ASHLAND4	138	267474	1.05	0.9	0.86228
34W	BASELIN4	138	267474	1.05	0.9	0.84456
34W	HOCHJCT4	138	267474	1.05	0.9	0.82458
34W	BENNGTN4	138	267474	1.05	0.9	0.64123
34W	BROKNBW4	138	267474	1.05	0.9	0.816
34W	CIVIT 4	138	267474	1.05	0.9	0.87403
34W	COLBERT4	138	267474	1.05	0.9	0.59784
34W	COLGATE4	138	267474	1.05	0.9	0.83546
34W	COMANCH4	138	267474	1.05	0.9	0.86186
34W	DARWIN 4	138	267474	1.05	0.9	0.76544
34W	DOMINAN4	138	267474	1.05	0.9	0.82107
34W	DURANTP4	138	267474	1.05	0.9	0.62638
34W	ENOS 4	138	267474	1.05	0.9	0.60582
34W	FROGVIL4	138	267474	1.05	0.9	0.70317
34W	CHAHTA 4	138	267474	1.05	0.9	0.84495
34W	HLDTNTP4	138	267474	1.05	0.9	0.75594
34W	HOCHTWN4	138	267474	1.05	0.9	0.83822
34W	HOLYCRK4	138	267474	1.05	0.9	0.80624
34W	HUGO PP4	138	267474	1.05	0.9	0.71781
34W	IDABEL 4	138	267474	1.05	0.9	0.79801
34W	KRSEY2_4	138	267474	1.05	0.9	0.60308
34W	LANE 4	138	267474	1.05	0.9	0.79656
34W	LASALLE4	138	267474	1.05	0.9	0.82379
34W	LATTA 4	138	267474	1.05	0.9	0.82923
34W	LATTAJT4	138	267474	1.05	0.9	0.83106
34W	LEBANTP4	138	267474	1.05	0.9	0.62347
34W	LOCO 4	138	267474	1.05	0.9	0.82008
34W	MARIETA4	138	267474	1.05	0.9	0.65442
34W	MTRIVER4	138	267474	1.05	0.9	0.82928
34W	OILCRTP4	138	267474	1.05	0.9	0.83771

Model	Facility Name	Facility Voltage (kV)	Contingency Name	Voltage Maximum (pu)	Voltage Minimum (pu)	Bus Voltage (pu)
34W	OAKLAWN4	138	267474	1.05	0.9	0.75882
34W	PINTO 4	138	267474	1.05	0.9	0.83361
34W	RATTAN 4	138	267474	1.05	0.9	0.73943
34W	RINGLNG4	138	267474	1.05	0.9	0.74113
34W	RUSSETT4	138	267474	1.05	0.9	0.6099
34W	SCLMNJC4	138	267474	1.05	0.9	0.61863
34W	SOLOCUP4	138	267474	1.05	0.9	0.82834
34W	STRATFD4	138	267474	1.05	0.9	0.84984
34W	SWILSON4	138	267474	1.05	0.9	0.6977
34W	TEXOMA 4	138	267474	1.05	0.9	0.60721
34W	TEXOMAJ4	138	267474	1.05	0.9	0.61138
34W	STNWLSW4	138	267474	1.05	0.9	0.81724
34W	BOGGY4	138	267474	1.05	0.9	0.81503
34W	STNWLTP4	138	267474	1.05	0.9	0.81819
34W	UNGER 4	138	267474	1.05	0.9	0.66085
34W	VALLANT4	138	267474	1.05	0.9	0.74049
34W	WSBNKTP4	138	267474	1.05	0.9	0.68379
34W	BENNSUB4	138	267474	1.05	0.9	0.64026
34W	HOWE 4	138	267474	1.05	0.9	0.64234
34W	GOLDENSW4	138	267474	1.05	0.9	0.81963
34W	DOMINJCT4	138	267474	1.05	0.9	0.82133
34W	GEN-2017-023	138	267474	1.05	0.9	0.71781
34W	ALLEN 4	138	267474	1.05	0.9	0.86291
34W	TUPELO 4	138	267474	1.05	0.9	0.81492
34W	S BROWN4	138	267474	1.05	0.9	0.616
34W	DENISON4	138	267474	1.05	0.9	0.61651
34W	BRKN BW4	138	267474	1.05	0.9	0.84616
34W	GERTY 4	138	267474	1.05	0.9	0.86396

SHORT CIRCUIT

SPP performed short circuit analysis for the 2029 Summer Peak with the new load addition. The analysis identified the currents as listed in Table 3-3.

Table 3-3: Short Circuit Results

Season	Model	Fault	Bus	Current (Amps)
29S	Max Fault	Three Phase	4MEMORALT 138.00	793
29S	Max Fault	Three Phase	LOCKSBRG 4 138.00	793
29S	Max Fault	Three Phase	ASHDWN_W 4 138.00	793
29S	Max Fault	Three Phase	S BROWN4 138.00	793
29S	Max Fault	Three Phase	CHAMSPR7 345.00	317
29S	Max Fault	Three Phase	ASHDWN4 138.00	793

Season	Model	Fault	Bus	Current (Amps)
29S	Max Fault	Three Phase	OKAY 4 138.00	793
29S	Max Fault	Three Phase	PATTERS2 69.000	1,586
29S	Max Fault	Three Phase	SOFRMAN 4 138.00	793
29S	Max Fault	Three Phase	PATTERS4 138.00	793
29S	Max Fault	Three Phase	SNASHVL4 138.00	793
29S	Max Fault	Three Phase	PATTN1-1 13.200	8,290
29S	Max Fault	Three Phase	PATTN2-1 12.470	8,775
29S	Max Fault	Three Phase	TURK 4 138.00	793
29S	Max Fault	Three Phase	TURK 7 345.00	317
29S	Max Fault	Three Phase	TURK 3 115.00	952
29S	Max Fault	Three Phase	TURK 1 13.800	7,929
29S	Max Fault	Three Phase	TURK1 1 13.200	8,290
29S	Max Fault	Three Phase	SW SHV 7 345.00	317
29S	Max Fault	Three Phase	NASH 4 138.00	793
29S	Max Fault	Three Phase	BANN 2 69.000	1,586
29S	Max Fault	Three Phase	BANN 4 138.00	793
29S	Max Fault	Three Phase	NNBOSTN2 69.000	1,586
29S	Max Fault	Three Phase	NNBOSTN4 138.00	793
29S	Max Fault	Three Phase	NWTXARK4 138.00	793
29S	Max Fault	Three Phase	NWTXARK7 345.00	317
29S	Max Fault	Three Phase	REDSRG4 138.00	793
29S	Max Fault	Three Phase	SETEXAR4 138.00	793
29S	Max Fault	Three Phase	SUGARHL2 69.000	1,586
29S	Max Fault	Three Phase	SUGARHL4 138.00	793
29S	Max Fault	Three Phase	ALUMAX 4 138.00	793
29S	Max Fault	Three Phase	BANN2-1 14.500	7,546
29S	Max Fault	Three Phase	BANN1-1 13.800	7,929
29S	Max Fault	Three Phase	NNBT2-1 13.200	8,290
29S	Max Fault	Three Phase	NWTEX1-1 13.800	7,929
29S	Max Fault	Three Phase	NWTEX2-1 13.800	7,929
29S	Max Fault	Three Phase	SHILL1-1 12.470	8,775
29S	Max Fault	Three Phase	RIFFIN REC4 138.00	793
29S	Max Fault	Three Phase	MANDEVILTP4 138.00	793
29S	Max Fault	Three Phase	LYDIA 7 345.00	317
29S	Max Fault	Three Phase	WELSH 7 345.00	317
29S	Max Fault	Three Phase	PIRKEY 7 345.00	317
29S	Max Fault	Three Phase	LONGWD 7 345.00	317
29S	Max Fault	Three Phase	WILKES-1 13.200	8,290
29S	Max Fault	Three Phase	DIANA 4 138.00	793
29S	Max Fault	Three Phase	DIANA 7 345.00	317
29S	Max Fault	Three Phase	WILKES 4 138.00	793
29S	Max Fault	Three Phase	WILKES 7 345.00	317
29S	Max Fault	Three Phase	DIANA-M1 13.800	7,929
29S	Max Fault	Three Phase	DIANA-S1 13.800	7,929
29S	Max Fault	Three Phase	DIANA-N1 13.800	7,929
29S	Max Fault	Three Phase	WELSHDC1 345.00	317
29S	Max Fault	Three Phase	SPPMAINBUS 345.00	317

Season	Model	Fault	Bus	Current (Amps)
29S	Max Fault	Three Phase	SPP-CAP1 345.00	317
29S	Max Fault	Three Phase	SPP-CAP2 345.00	317
29S	Max Fault	Three Phase	SPP-CAP3 345.00	317
29S	Max Fault	Three Phase	WELSH1-1 18.000	6,079
29S	Max Fault	Three Phase	WELSH3-1 18.000	6,079
29S	Max Fault	Three Phase	WILKE3-1 22.000	4,974
29S	Max Fault	Three Phase	TURKCOAL 24.000	4,559
29S	Max Fault	Three Phase	CLARKSV7 345.00	317
29S	Max Fault	Three Phase	RSS T1 4 138.00	793
29S	Max Fault	Three Phase	R.S.S.-7 345.00	317
29S	Max Fault	Three Phase	ONETA--7 345.00	317
29S	Max Fault	Three Phase	COGENT 7 345.00	317
29S	Max Fault	Three Phase	SAPLPRD7 345.00	317
29S	Max Fault	Three Phase	RSS T2 4 138.00	793
29S	Max Fault	Three Phase	RSST2 T1 13.800	7,929
29S	Max Fault	Three Phase	RSST1 T1 13.800	7,929
29S	Max Fault	Three Phase	VALYTMTP2 69.000	1,586
29S	Max Fault	Three Phase	MCALT4-1 13.800	7,929
29S	Max Fault	Three Phase	HUGO4-1 13.800	7,929
29S	Max Fault	Three Phase	V-WEYCO1 4 138.00	793
29S	Max Fault	Three Phase	B.BOW 4 138.00	793
29S	Max Fault	Three Phase	V-WEYCO T4 138.00	793
29S	Max Fault	Three Phase	GA PAC 2 69.000	1,586
29S	Max Fault	Three Phase	W CITY 2 69.000	1,586
29S	Max Fault	Three Phase	WCITYTP2 69.000	1,586
29S	Max Fault	Three Phase	KI PMPN2 69.000	1,586
29S	Max Fault	Three Phase	KIPUMPT2 69.000	1,586
29S	Max Fault	Three Phase	FIXCT4 138.00	793
29S	Max Fault	Three Phase	IDABEL-4 138.00	793
29S	Max Fault	Three Phase	B.BOWTP4 138.00	793
29S	Max Fault	Three Phase	CRAIGJT4 138.00	793
29S	Max Fault	Three Phase	HUGO---2 69.000	1,586
29S	Max Fault	Three Phase	LONEOAK4 138.00	793
29S	Max Fault	Three Phase	MCALEST2 69.000	1,586
29S	Max Fault	Three Phase	HUGO---4 138.00	793
29S	Max Fault	Three Phase	SMCALTP4 138.00	793
29S	Max Fault	Three Phase	PITTSB-7 345.00	317
29S	Max Fault	Three Phase	MCALEST4 138.00	793
29S	Max Fault	Three Phase	MCALESTIND 4138.00	793
29S	Max Fault	Three Phase	VALIANT2 69.000	1,586
29S	Max Fault	Three Phase	VALIANT7 345.00	317
29S	Max Fault	Three Phase	FTOWSON2 69.000	1,586
29S	Max Fault	Three Phase	VALIANT4 138.00	793
29S	Max Fault	Three Phase	SAWYER 2 69.000	1,586
29S	Max Fault	Three Phase	DUSTIN-4 138.00	793
29S	Max Fault	Three Phase	KIOWA 7 345.00	317
29S	Max Fault	Three Phase	VALN1-1 13.800	7,929

Season	Model	Fault	Bus	Current (Amps)
29S	Max Fault	Three Phase	VALN2-1 13.800	7,929
29S	Max Fault	Three Phase	VALN3-1 13.800	7,929
29S	Max Fault	Three Phase	C-RIVER4 138.00	793
29S	Max Fault	Three Phase	C-RIVER1 13.800	7,929
29S	Max Fault	Three Phase	EARLSBORO 4138.00	793
29S	Max Fault	Three Phase	TALAWANDA 4138.00	793
29S	Max Fault	Three Phase	V-WEYCO2 4 138.00	793
29S	Max Fault	Three Phase	TREASILD7 345.00	317
29S	Max Fault	Three Phase	LES#5-1 13.800	7,929
29S	Max Fault	Three Phase	LES#4-1 13.800	7,929
29S	Max Fault	Three Phase	CORNVIL4 138.00	793
29S	Max Fault	Three Phase	L.E.S.-4 138.00	793
29S	Max Fault	Three Phase	L.E.S.-7 345.00	317
29S	Max Fault	Three Phase	BLANCHD4 138.00	793
29S	Max Fault	Three Phase	TERRYRD7 345.00	317
29S	Max Fault	Three Phase	RUSHSPR7 345.00	317
29S	Max Fault	Three Phase	RUSHSPR1-1 13.800	7,929
29S	Max Fault	Three Phase	RSHSPR1_TER113.800	7,929
29S	Max Fault	Three Phase	O.K.U.3-7 345.00	317
29S	Max Fault	Three Phase	KIOWA G1 18.000	6,079
29S	Max Fault	Three Phase	KIOWA G2 18.000	6,079
29S	Max Fault	Three Phase	KIOWA S1 18.000	6,079
29S	Max Fault	Three Phase	KIOWA S2 18.000	6,079
29S	Max Fault	Three Phase	KIOWA G3 18.000	6,079
29S	Max Fault	Three Phase	KIOWA G4 18.000	6,079
29S	Max Fault	Three Phase	RUSHSPRW1-1 34.500	3,172
29S	Max Fault	Three Phase	RSHSPR1_COL134.500	3,172
29S	Max Fault	Three Phase	RSHSPR1_MPT1345.00	317
29S	Max Fault	Three Phase	BURGETT4 138.00	793
29S	Max Fault	Three Phase	MARSHL 4 138.00	793
29S	Max Fault	Three Phase	MINCO 7 345.00	317
29S	Max Fault	Three Phase	JOHNCO 4 138.00	793
29S	Max Fault	Three Phase	JOHNCO 7 345.00	317
29S	Max Fault	Three Phase	JOHNCO11 13.800	7,929
29S	Max Fault	Three Phase	CTNWOOD4 138.00	793
29S	Max Fault	Three Phase	KETCHTP4 138.00	793
29S	Max Fault	Three Phase	PINE ST4 138.00	793
29S	Max Fault	Three Phase	CHTWOOD4 138.00	793
29S	Max Fault	Three Phase	BRADEN 4 138.00	793
29S	Max Fault	Three Phase	PIEDMNT4 138.00	793
29S	Max Fault	Three Phase	LNEOAK 4 138.00	793
29S	Max Fault	Three Phase	NORTWST4 138.00	793
29S	Max Fault	Three Phase	NORTWST7 345.00	317
29S	Max Fault	Three Phase	SPRNGCK7 345.00	317
29S	Max Fault	Three Phase	SPGCK1&2 13.800	7,929
29S	Max Fault	Three Phase	SPGCK3&4 13.800	7,929
29S	Max Fault	Three Phase	NORTWS41 13.800	7,929

Season	Model	Fault	Bus	Current (Amps)
29S	Max Fault	Three Phase	CIMARON4 138.00	793
29S	Max Fault	Three Phase	REDBUD1S 18.000	6,079
29S	Max Fault	Three Phase	REDBUD2S 18.000	6,079
29S	Max Fault	Three Phase	CIMARON7 345.00	317
29S	Max Fault	Three Phase	MCCLAIN4 138.00	793
29S	Max Fault	Three Phase	REDBUD3S 18.000	6,079
29S	Max Fault	Three Phase	JNSKAMO4 138.00	793
29S	Max Fault	Three Phase	ARCADIA4 138.00	793
29S	Max Fault	Three Phase	ARCADIA7 345.00	317
29S	Max Fault	Three Phase	REDBUD 7 345.00	317
29S	Max Fault	Three Phase	REDBUD1G 18.000	6,079
29S	Max Fault	Three Phase	REDBUD2G 18.000	6,079
29S	Max Fault	Three Phase	REDBUD3G 18.000	6,079
29S	Max Fault	Three Phase	PLVALLY4 138.00	793
29S	Max Fault	Three Phase	OAKTRET4 138.00	793
29S	Max Fault	Three Phase	DRAPER 4 138.00	793
29S	Max Fault	Three Phase	DRAPER 7 345.00	317
29S	Max Fault	Three Phase	REDBUD4S 18.000	6,079
29S	Max Fault	Three Phase	HSL 4 138.00	793
29S	Max Fault	Three Phase	REDBUD4G 18.000	6,079
29S	Max Fault	Three Phase	MIDWEST4 138.00	793
29S	Max Fault	Three Phase	CEDARLN4 138.00	793
29S	Max Fault	Three Phase	SOONRTP4 138.00	793
29S	Max Fault	Three Phase	HOLLYWD4 138.00	793
29S	Max Fault	Three Phase	CHERYCK4 138.00	793
29S	Max Fault	Three Phase	GM 4 138.00	793
29S	Max Fault	Three Phase	TURNER 4 138.00	793
29S	Max Fault	Three Phase	SE15TH 4 138.00	793
29S	Max Fault	Three Phase	TINKER54 138.00	793
29S	Max Fault	Three Phase	BARNES 4 138.00	793
29S	Max Fault	Three Phase	ROSEDAL2 69.000	1,586
29S	Max Fault	Three Phase	SEMINL1G 20.900	5,236
29S	Max Fault	Three Phase	SEMINL2G 17.100	6,399
29S	Max Fault	Three Phase	SEMINL3G 20.900	5,236
29S	Max Fault	Three Phase	SEMINOL4 138.00	793
29S	Max Fault	Three Phase	SEMINOL7 345.00	317
29S	Max Fault	Three Phase	PEARSNT2 69.000	1,586
29S	Max Fault	Three Phase	MAUD 2 69.000	1,586
29S	Max Fault	Three Phase	MAUD 4 138.00	793
29S	Max Fault	Three Phase	ERLSBOR2 69.000	1,586
29S	Max Fault	Three Phase	FRSTHIL2 69.000	1,586
29S	Max Fault	Three Phase	FRSTHIL4 138.00	793
29S	Max Fault	Three Phase	WLNUTCK4 138.00	793
29S	Max Fault	Three Phase	PALIOGE2 69.000	1,586
29S	Max Fault	Three Phase	PAOLI- 4 138.00	793
29S	Max Fault	Three Phase	PAULSVL2 69.000	1,586
29S	Max Fault	Three Phase	CHIGLEY2 69.000	1,586

Season	Model	Fault	Bus	Current (Amps)
29S	Max Fault	Three Phase	CHIGLEY4 138.00	793
29S	Max Fault	Three Phase	ARBUCKL2 69.000	1,586
29S	Max Fault	Three Phase	ARBUCKL4 138.00	793
29S	Max Fault	Three Phase	RUSSET-4 138.00	793
29S	Max Fault	Three Phase	MILLCKT4 138.00	793
29S	Max Fault	Three Phase	SXMLCKT4 138.00	793
29S	Max Fault	Three Phase	OAKLAW-4 138.00	793
29S	Max Fault	Three Phase	MAYSVIL4 138.00	793
29S	Max Fault	Three Phase	RATLIFF4 138.00	793
29S	Max Fault	Three Phase	POOLVIL4 138.00	793
29S	Max Fault	Three Phase	BLUERIV4 138.00	793
29S	Max Fault	Three Phase	SUNNYS4 138.00	793
29S	Max Fault	Three Phase	SUNNYS7 345.00	317
29S	Max Fault	Three Phase	UNIROY 4 138.00	793
29S	Max Fault	Three Phase	LONEGRV4 138.00	793
29S	Max Fault	Three Phase	GLASSES4 138.00	793
29S	Max Fault	Three Phase	MADINDT4 138.00	793
29S	Max Fault	Three Phase	CANEYCK4 138.00	793
29S	Max Fault	Three Phase	LTLCTY4 138.00	793
29S	Max Fault	Three Phase	BROWNT4 138.00	793
29S	Max Fault	Three Phase	MADLIND4 138.00	793
29S	Max Fault	Three Phase	ROCKYPT2 69.000	1,586
29S	Max Fault	Three Phase	ROCKYPT4 138.00	793
29S	Max Fault	Three Phase	SPRNDAL4 138.00	793
29S	Max Fault	Three Phase	BERWYN 4 138.00	793
29S	Max Fault	Three Phase	VANOSS 4 138.00	793
29S	Max Fault	Three Phase	PARKLN 2 69.000	1,586
29S	Max Fault	Three Phase	PARKLN 4 138.00	793
29S	Max Fault	Three Phase	MILLCRK4 138.00	793
29S	Max Fault	Three Phase	MUSKOG4G 18.000	6,079
29S	Max Fault	Three Phase	MUSKOG7 345.00	317
29S	Max Fault	Three Phase	MUSKOG5G 18.000	6,079
29S	Max Fault	Three Phase	MUSKOG6G 24.000	4,559
29S	Max Fault	Three Phase	PECANCK4 138.00	793
29S	Max Fault	Three Phase	PECANCK5 161.00	680
29S	Max Fault	Three Phase	PECANCK7 345.00	317
29S	Max Fault	Three Phase	STRLGTP4 138.00	793
29S	Max Fault	Three Phase	FTSMTHW5 161.00	680
29S	Max Fault	Three Phase	FTSMITH7 345.00	317
29S	Max Fault	Three Phase	FTSMITH8 500.00	219
29S	Max Fault	Three Phase	SOTHADA4 138.00	793
29S	Max Fault	Three Phase	ARDWEST4 138.00	793
29S	Max Fault	Three Phase	LBRTYLK4 138.00	793
29S	Max Fault	Three Phase	CRESENT4 138.00	793
29S	Max Fault	Three Phase	SUNYSD 1 13.800	7,929
29S	Max Fault	Three Phase	TATONGA7 345.00	317
29S	Max Fault	Three Phase	CHEEKTP4 138.00	793

Season	Model	Fault	Bus	Current (Amps)
29S	Max Fault	Three Phase	C-RIVER7 345.00	317
29S	Max Fault	Three Phase	MCNOWND7 345.00	317
29S	Max Fault	Three Phase	AIRDEPT4 138.00	793
29S	Max Fault	Three Phase	RNDBARN4 138.00	793
29S	Max Fault	Three Phase	LGARBER4 138.00	793
29S	Max Fault	Three Phase	PURCELL4 138.00	793
29S	Max Fault	Three Phase	KNAWATP2 69.000	1,586
29S	Max Fault	Three Phase	MATHWSN7 345.00	317
29S	Max Fault	Three Phase	LTRIVRT2 69.000	1,586
29S	Max Fault	Three Phase	VANOSTP4 138.00	793
29S	Max Fault	Three Phase	MNCWND37 345.00	317
29S	Max Fault	Three Phase	SULPHR 4 138.00	793
29S	Max Fault	Three Phase	CARTRCO4 138.00	793
29S	Max Fault	Three Phase	ORIGINW4 138.00	793
29S	Max Fault	Three Phase	MAYSVLT4 138.00	793
29S	Max Fault	Three Phase	FSHRTAP7 345.00	317
29S	Max Fault	Three Phase	ARCADI41 13.800	7,929
29S	Max Fault	Three Phase	ARBUCKL1 13.200	8,290
29S	Max Fault	Three Phase	ARCADI21 13.800	7,929
29S	Max Fault	Three Phase	ARCADI31 13.800	7,929
29S	Max Fault	Three Phase	CHIGLEY1 13.200	8,290
29S	Max Fault	Three Phase	CIMARO11 13.800	7,929
29S	Max Fault	Three Phase	CIMARO21 13.800	7,929
29S	Max Fault	Three Phase	DRAPER31 13.800	7,929
29S	Max Fault	Three Phase	DRAPER41 13.800	7,929
29S	Max Fault	Three Phase	FRSTHIL1 13.800	7,929
29S	Max Fault	Three Phase	FTSMTH11 13.800	7,929
29S	Max Fault	Three Phase	FTSMTH51 13.800	7,929
29S	Max Fault	Three Phase	MAUD 1 13.200	8,290
29S	Max Fault	Three Phase	NORTWS21 13.800	7,929
29S	Max Fault	Three Phase	NORTWS31 13.800	7,929
29S	Max Fault	Three Phase	PAOLI 1 13.200	8,290
29S	Max Fault	Three Phase	PARKLN11 13.200	8,290
29S	Max Fault	Three Phase	PARKLN21 13.200	8,290
29S	Max Fault	Three Phase	PECANC11 13.800	7,929
29S	Max Fault	Three Phase	PECANC31 13.800	7,929
29S	Max Fault	Three Phase	ROCKYPT1 13.200	8,290
29S	Max Fault	Three Phase	SEMINO11 14.400	7,599
29S	Max Fault	Three Phase	SEMINO21 14.400	7,599
29S	Max Fault	Three Phase	PECANC21 13.800	7,929
29S	Max Fault	Three Phase	SUNNYS1 13.800	7,929
29S	Max Fault	Three Phase	GRIFFIN7 345.00	317
29S	Max Fault	Three Phase	DRAPER21 13.800	7,929
29S	Max Fault	Three Phase	GRACMNT7 345.00	317
29S	Max Fault	Three Phase	DRPSPRG4 138.00	793
29S	Max Fault	Three Phase	REDNGTN7 345.00	317
29S	Max Fault	Three Phase	STIRLNG4 138.00	793

Season	Model	Fault	Bus	Current (Amps)
29S	Max Fault	Three Phase	LKKONWA4 138.00	793
29S	Max Fault	Three Phase	DMNDSC11 34.500	3,172
29S	Max Fault	Three Phase	DMNDSC21 34.500	3,172
29S	Max Fault	Three Phase	DMNDSL11 34.500	3,172
29S	Max Fault	Three Phase	DMNDSL21 34.500	3,172
29S	Max Fault	Three Phase	DMNDSPG7 345.00	317
29S	Max Fault	Three Phase	DMNDST21 13.800	7,929
29S	Max Fault	Three Phase	DMNDST11 13.800	7,929
29S	Max Fault	Three Phase	TRAV3WD7 345.00	317
29S	Max Fault	Three Phase	LOVECO 4 138.00	793
29S	Max Fault	Three Phase	OKTAHA 7 345.00	317
29S	Max Fault	Three Phase	OKTAHA 5 161.00	680
29S	Max Fault	Three Phase	OKTAHA 2 69.000	1,586
29S	Max Fault	Three Phase	OKTAHA61 13.800	7,929
29S	Max Fault	Three Phase	OKTAHA71 13.200	8,290
29S	Max Fault	Three Phase	NORMHLL7 345.00	317
29S	Max Fault	Three Phase	NORMHLL4 138.00	793
29S	Max Fault	Three Phase	NORMHL11 13.800	7,929
29S	Max Fault	Three Phase	NORMHL21 13.800	7,929
29S	Max Fault	Three Phase	GLSSAND4 138.00	793
29S	Max Fault	Three Phase	ROCKHVN4 138.00	793
29S	Max Fault	Three Phase	GADWALL7 345.00	317
29S	Max Fault	Three Phase	RAVEN 7 345.00	317
29S	Max Fault	Three Phase	SEMINO31 14.400	7,599
29S	Max Fault	Three Phase	FTSMITH71 13.800	7,929
29S	Max Fault	Three Phase	SAWYER4 138.00	793
29S	Max Fault	Three Phase	GARVIN4 138.00	793
29S	Max Fault	Three Phase	REAGAN 4 138.00	793
29S	Max Fault	Three Phase	ENOSJCT4 138.00	793
29S	Max Fault	Three Phase	HUGOITC4 138.00	793
29S	Max Fault	Three Phase	FRNKLNS4 138.00	793
29S	Max Fault	Three Phase	FROGVIL4 138.00	793
29S	Max Fault	Three Phase	HUGO1 23.400	4,676
29S	Max Fault	Three Phase	HUGO PP4 138.00	793
29S	Max Fault	Three Phase	LEBANTP4 138.00	793
29S	Max Fault	Three Phase	RATTAN 4 138.00	793
29S	Max Fault	Three Phase	RUSSETT4 138.00	793
29S	Max Fault	Three Phase	TEXOMAJ4 138.00	793
29S	Max Fault	Three Phase	VALLANT4 138.00	793
29S	Max Fault	Three Phase	WSBNKTP4 138.00	793
29S	Max Fault	Three Phase	HOWE 4 138.00	793
29S	Max Fault	Three Phase	HUGO 7 345.00	317
29S	Max Fault	Three Phase	HUGO TERTA 13.800	7,929

STABILITY

SPP performed a Fast Fault Screening (FFS) using the 2034 Summer Peak for the base case and change case models. The change case models include the Pittsburg delivery point changes. SPP determined no significant differences in the critical clearing times between the base and change cases. Therefore, a transient stability analysis is not required.

TRANSMISSION SOLUTIONS

The addition of the load at the existing Pittsburg delivery point caused potential thermal overloads of the Pittsburg to Seminole 345 kV line and low voltages on the 138 kV systems around Pittsburg. SPP's solutions consisted of addressing the overload and addressing the Pittsburg Substation configuration. The solutions are listed below.

Solution #1: Pittsburg to Seminole Rebuild (Total cost \$115M)

- Pittsburg to Seminole 345 kV Rebuild
- Pittsburg 345 kV substation work; 3 circuit breakers

Solution #2 Pittsburg to Seminole Double Circuit (Total cost \$213.6M)

- Pittsburg to Seminole 345 kV double circuit
- Pittsburg 345 kV substation work; 3 circuit breakers

Solution #3: Pittsburg to Seminole Rebuild (Total cost \$142.8M)

- Pittsburg to Seminole 345 kV Rebuild
- 100 MVAR Pittsburg 345 kV capacitor bank

SPP chose to move forward with Solution #1. This solution solves all issues identified in Table 3-1 and Table 3-2 in the most cost-effective manner.

Table 3-4: Recommended Upgrade Solution 1

New Upgrade Description*	Mileage	MVA (Rate B)	Date Needed**	Host Transmission Owner	Estimated Cost***
Pittsburg to Seminole 345 kV Rebuild	51.27	1792	9/30/2031	OGE/AEP	\$112,794,000
Pittsburg 345 kV substation work; 3 circuit breakers	-	-	9/30/2031	AEP	\$2,175,000
TOTAL NEW UPGRADE COST					\$114,969,000

*All requests with a Network Upgrade(s) identified in the DPNS will be subject to further evaluation in the soonest available Integrated Transmission Planning Assessment that is able to include the load changes, if it is determined that the Network Upgrade(s) will be able to meet the study timeframe requirements pursuant to the standardized project timelines in SPP Business Practices, based on the SPP determined Network Upgrade(s) need date. If it is determined that a Network Upgrade(s) identified from a DPNS is unable to be further evaluated pursuant to the Integrated Transmission Planning Assessment, the DPNS report will be posted on the SPP website once SPP is notified by the Transmission Customer to update the applicable Network Integration Transmission Service Agreement to reflect the changes in delivery points and the Network Upgrade(s).

Pursuant to Attachment AQ of the Tariff, the Transmission provider is responsible for assessing the impacts on the Transmission System caused by modifying an existing delivery point or establishing the new delivery point through the Delivery Point Network Study ("DPNS"). The DPNS may determine the need for a Network Upgrade(s) necessary for the modification of an existing delivery point or the establishment of a new delivery point. A Network Upgrade(s) that the Transmission Customer or Host Transmission Owner desires that exceeds the needed Network Upgrade(s) identified in the DPNS will need to be studied through the Transmission Provider's Sponsored Upgrade study process to evaluate the impacts of the desired changes on the Transmission System.

**If the project need date specified in this study cannot be met, the Transmission Owner will be required to submit mitigations pursuant to the SPP Project Tracking process. All upgrades or mitigations must be in place prior to the dates shown in Table 3-4.

***Note that the estimated new upgrade cost provided in this report is an SPP Conceptual Cost Estimate only; this is preliminary, and a more refined Study Cost Estimate will be developed after issuance of this report through a Standardized Cost Estimate Reporting Template (SCERT).

SECTION 4: CONCLUSION

The AC analysis revealed potential thermal and voltage violations associated with the Pittsburg load addition. The study shows that the following upgrades are required to reliably serve the load addition:

- Pittsburg to Seminole 345 kV Rebuild
- Pittsburg 345 kV substation work; 3 circuit breakers

The transmission upgrades in Table 3-4 are recommended to mitigate the potential voltage and thermal violations.