FEASIBILITY STUDY

700MW/1100MW Generation Unit in KCPL Control Area

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Rev. 1

Executive Summary

Customer has requested a Feasibility Study to evaluate a proposal to add 700MW to 1100MW of generation in KCPL Control Area. The power plant is to be constructed adjacent to an existing KCPL substation and interconnected with the 345kV transmission. The new facility is expected to be in operation in summer 2005.

Customer has submitted two requests for generation interconnection studies. A proposal to add a 700MW or 1100MW coal-fired plant is being considered. This study identifies interconnection facility requirements and addresses the transmission impacts of each case with recommended improvements that will alleviate overloading during contingency events.

The 2004 summer peak load flow model was modified to include system improvements and additional generation planned for summer 2005 and used in this analysis to study the base case load flow and contingency events. Single contingency outages were applied to the base case model without the proposed generation facilities to identify any pre-existing constraints. Addition of the Customer facilities provided a study case comparison to determine the impact of the new generation facilities on the transmission system. The analysis indicates that the proposed generation additions in the area increase overloading on the 345kV and 161kV system.

Additional circuit upgrades are required to eliminate overloading on the 345kV and 161kV transmission system. The study indicates that an Iatan-Nashua 345kV circuit, which is necessary for the generation interconnection, transfers the additional power from Iatan to the eastern part of the 345kV transmission system. For the 700MW case a 345/161kV transformer located at the Nashua substation provides a delivery point for power into the 161kV transmission system in the central KCPL territory. This relieves overloading on the 161kV circuits out of Hawthorn to the west. For the 1100MW case the overloading on the Hawthorn circuits can be eliminated with the construction of a new 161kV circuit from Blue Valley to Crosstown substations. Additional upgrades are required on the Iatan-St. Joe 345kV line owned by St. Joe Light & Power to increase the capability of that circuit.

The interconnection facilities required for the Customer project involve expansion of an existing KCPL substation 345kV bus and installation of additional 345kV circuit breakers. The cost for the interconnection facilities is estimated to be $16,405,000 less CIAC adders. Projected in service date for the Customer interconnection is July 1, 2005.

Introduction

1.1 Project Description

This Feasibility Study was conducted at the request of Customer to evaluate the installation of 700MW-1100MW of coal-fired generation in the KCPL control area. The request for the study was made on Feb 22, 2001.

Customer is currently considering a plan to install a 700MW or 1100MW generating unit in the KCPL control area to serve load in the nearby region. This study addresses both proposals and identifies system improvements necessary to relieve any constraints caused by the new generation. The system interconnection is to be made to the 345kV transmission system. The market for the new generation is not directly specified. However, the Entergy control area is identified as the sink for the generation.

1.2 Study Methodology

This feasibility study consists of a system load flow analysis of the 2004 summer peak model, which has been modified for summer 2005 conditions, to examine the power flow resulting from the addition of new generation in the area. Since the planned in-service date for the proposed facility is summer 2005, the study model includes any transmission system upgrades that are planned for summer 2005 and all generation facilities that are proposed for that time. Included in the study are 962MW of IPP generation in the KCPL control area that has been proposed in the years prior to the service date of the Customer facilities. The analysis performed for this request is based on the information supplied by Customer. In the case of incomplete data, reasonable assumptions have been made to complete the analysis. Specific equipment information is required for a more detailed impact study.

The Customer plant is to be located in the Kansas City Power & Light (KCPL) control area and generation re-dispatch is performed on specific units within the KCPL system in the model data. The study case includes the transfer to the Entergy control area, and generation is scaled within that area to accommodate the transfer. Table 1 lists the amount of the transfer between the KCPL and Entergy control areas.

The normal operating conditions for the study are established by performing a load flow analysis with all lines in service. Full AC contingency analysis is used to investigate the limiting constraints of the transmission system during contingency events. Comparisons are made between the cases with and without the CUSTOMER generation in service in order to identify the severity and cause of the overloading conditions. All branches in the KCPL and surrounding control areas above 100kV and all ties with KCPL are monitored for overloads exceeding 100% of normal rating. Buses are monitored for voltage deviations exceeding +/- 5% of nominal.

Table 1 –Share of new generation by control areas for 2005 summer peak study case		
Transfers of Customer generation to area sink		
	Generation Share /Transfer	
	700MW Plant	**1100MW Plant**
Entergy - EES (151)	700	1100
Total	700	1100

1.3 Plant Details and Modeling

The proposed Customer facilities will be connected to the 345kV system. The plant configuration consists of one 700MW or 1100MW coal-fired generating unit and auxiliary load interconnected as shown in Appendix B. For the 700MW option the gross generation output is expected to be 700MW during peak operation. Plant auxiliary requirements are not specified, but are estimated to be 25MW for the purpose of this study. For the 1100MW option the gross generation output is expected to be 1100MW during peak operation with 60MW plant auxiliary load. Prevailing market conditions will determine the actual output of the plant, but the peak output is used in the study to assess the impact of the generation on the transmission system.

Changes to the 2004 summer peak load flow model have been included in this analysis for improvements in progress or planned for service by summer 2005. The projects include circuit reconductoring and equipment upgrades that increase the capability of the transmission system, and a list of these improvements is included below.

- Stilwell-Antioch 161kV line rebuild 2003
- Antioch-Oxford 161kV line rebuild 2003
- Paola-S. Ottawa 161kV line improvements 2004
- Paola-Centennial 161kV switch upgrade 2005

2. Analysis - 700MW

2005 Summer Peak

The sink area for the Customer generation is the Entergy control area, and the load forecast for that market for the 2005 summer peak period is 24,290MW. The base case analysis includes generation and transfers, and it excludes the Customer generation facilities. The study case includes 700MW additional generation from the Customer plant with transfers from the KCPL area to the Entergy control area. Table 2 lists the specific generation dispatch in the KCPL control area and all net transfers to other control areas.

Table 2 – Generation Dispatch and Area Interchange Schedule

Comparison of base case and proposed 700MW Customer plant addition for 2005 summer peak

GENERATION DISPATCH(for KCPL control area)			**INTERCHANGE**		
Plant/Unit	**Base**	**Study**	**Area**	**Base**	**Study**
	w/o CUSTOMER plant	w/ CUSTOMER plant			
Hawthorn 5	560	560	EES	0	700
Hawthorn 6	45	45	AECI	-150	-150
Hawthorn 7	0	35	SWPA	-5	-5
Hawthorn 8	0	0	GRRD	-15	-15
Hawthorn 9	0	0	MIDW	0	0
Montrose #1	170	170	WERE	141	141
Montrose #2	164	164	MIPU	117	117
Montrose #3	163	155	KACY	35	35
LaCygne#1	688	688	EMDE	80	80
LaCygne#2	674	674	INDN	112	112
Iatan#1	670	670	SPRM	51	51
Northeast N.	0	0	STJO	121	121
Northeast S.	0	0			
Grand Ave	0	0			
Gardner	2	2			
Higginsville	34	34			
Paola Proposed #1	410	410			
Proposed #2	552	552			
Customer	0	700			

Load flow analysis with the Customer generation online and all lines in service reveals no base case overload conditions that result from the added generation. The contingency analysis indicates overloading of facilities in the KCPL and surrounding areas during outages of transmission facilities. Several overloads occur in the initial case prior to the addition of new generation, and in some cases overloads are reduced

or eliminated by the generation additions. The most critical 345kV system constraints are summarized in Table 3 with a comparison of conditions before and after the 700MW generation addition at the proposed plant.

Table 3 - 2005 summer peak - Significant 345kV overloaded facilities		
Normal and contingency flows with and without the proposed 700MW CUSTOMER generation		
Monitored line----normal ----------contingency	**Base Case W/o Cust.**	**Analysis Base Case w/ Cust.**
LaCygne-Stilwell(normal) – rating:1099MVA	1073	1018
Lang-Swissvale out	1112	-
Lang-Wichita out	1118	-
Stilwell-Swissvale out	1110	-
Benton-Wolf Creek out	1164	1119
Neosho-LaCygne out	1153	1148
Rosehill-Wolf Creek out	1156	1111
Auburn-Jeffrey EC out	1107	-
Lawrence Hill - Lawr EC out	1124	-
W. Gardner transformer #11 out	1133	-
W. Gardner-Craig out	1440	1337
Prop#2-W. Gardner out	1767	1640
St. Joe-Hawthorn out	1107	-
Craig transformer#11 or #22 out	1119	-
Craig transformer #33 out	1110	-
LaCygne-Prop#2 out	1389	1266
St. Joe Iatan out	1136	1115
Morgan-Neosho out	1145	1104
Jeffrey EC #1, #2, or #3 out	1138	-
Lawr EC #5 out	1124	
Stranger Creek transformer out	1105	-
Hawthorn #5 out	1161	1110
Montrose #1, #2, or #3 out	1112	-
Iatan #1 out	1129	-
Sibley #1 out	1142	-
Pleasant Hill #1, #2, or #3 out	1124	-
W. Gardner-Craig (normal) – rating:1099MVA	771	658
LaCygne-Stilwell out	1298	1154
Stilwell transformer #11 (normal) – rating: 550MVA	366	354
Stilwell transfomer #22 out	559	-
W. Gardner transformer #11 – rating:400MVA	200	210
W. Gardner-Craig out	480	449

Table 3 (cont'd) - 2005 summer peak - Significant 345kV overloaded facilities		
Normal and contingency flows with and without the proposed 700MW CUSTOMER generation		
Monitored line----normal ----------contingency	**Base Case W/o Cust.**	**Analysis Base Case w/ Cust.**
Prop#2-W. Gardner(normal) – rating:1099MVA	965	864
Hoyt-Jeffrey EC out	1105	-
Lacygne-Stilwell out	1629	1490
Craig transformer #33 (normal) - rating: 400	275	296
Craig transformer#11 or #22 out	-	415
Iatan-Stranger Creek(normal) - rating: 1099	236	528
Iatan-St. Joe out	-	1363
Iatan -St. Joe (normal) - rating: 956	544	850
Craig-Stranger Creek out	-	1003
Iatan-Stranger Creek out	-	1318

An outage of the LaCygne-Stilwell 345kV line causes the loading of the Craig-Lenexa 161kV circuit to reach 108% and the Greenwood-Lenexa 161kV line to reach 102% of capability. With the Craig transformer #11 or #22 out of service, the loading of the Craig #33 transformer reaches 104%. Loss of the Craig-Pflumm 161kV circuit results in overloading of the Craig-Lenexa line (111%) and the Greenwood-Lenexa line (106%). With an outage on the Craig-Cedar Creek line, the loading of the Craig-Lenexa line reaches 108% and the Greenwood-Lenexa line reaches 103%. The Craig-Lenexa line becomes loaded to 109% and the Greenwood-Lenexa line becomes loaded to 104% with the Pflumm-Overland Park circuit out of service.

Loss of the Craig-Stranger Creek 345kV circuit causes the loading on the Iatan-St. Joe 345kV line to reach 105%, and an outage of the Iatan-Stranger Creek causes the loading of the Iatan-St. Joe circuit to reach 138% of capability. With the Iatan-St. Joe circuit out of service, the Iatan-Stranger Creek 345kV line reaches 124%, the Craig-Lenexa 161kV line reaches 113%, and the Greenwood-Lenexa 161kV line reaches 107% of capability. With the Southtown-Forest 161kV circuit out of service, the Merriam-Roe Park circuit becomes loaded to 106%, and with the Greenwood-Cedar Creek circuit out of service, the Craig-Lenexa line is loaded to 106% of capability.

In the Missouri Public Service area the loss of the Salisbury-Norton 161kV circuit causes loading of the Windsor-Clinton 161kV circuit to increase to 106%. The Harrisonville 161/69kV transformer loading reaches 107% for an outage of the Archie-

Adrian line and 106% for an outage of the Butler-Adrian or the Montrose-Clinton circuit. Loss of the Longview 161/69kV transformer results in loading of the Martin City 161/69kV transformer to 118% of capability. With the Pleasant Hill 161/69kV transformer out of service, the Harrisonville 161/69kV transformer loading reaches 145% and the Martin City 161/69kV transformer loading reaches 102%.

Proposed Improvements

The Iatan-St. Joe circuit is rated at 956MVA normal capability and under normal operating conditions carries 64% of the plant capacity. The Iatan-Stranger Creek 345kV line is rated at 1099MVA normal capability and carries the remaining 36% of the plant capacity. During contingency outages of the 345kV circuits that transfer power from the Iatan facilities to the load centers, either circuit becomes overloaded. Contingency overloads on the 345kV system include the Craig #33 345/161kV transformer. Further overloads occur on the 161kV transmission lines that deliver power from the 345/161kV interface on the western side of the KCPL territory. Analysis indicates that a third circuit from Iatan to the Hawthorn-St. Joe 345kV line in conjunction with a 345/161kV transformer at Nashua would provide a new path for power transfer from the Customer plant. The new circuit, which is required for the Customer plant interconnection, would carry 37% of the plant output under normal conditions and would alleviate the overloading of the Iatan-St. Joe line and the Iatan-Stranger Creek line during contingency events. These system upgrades would also eliminate the Craig #33 transformer overloading and improve the delivery of power to the eastern side of the territory, relieving the 161kV contingency constraints. The total cost of improvements in the KCPL area is estimated to be $7,274,000. Table 4 lists the details and estimated costs for the recommended system improvements.

Current planning studies address the pre-existing overloads on the transmission facilities in the KCPL area. New line construction and reconductoring of existing circuits would provide relief for the contingency overloads that occur prior to the addition of new generation at the Customer plant. In the Missouri Public Service territory contingency overloads of facilities require further investigation to determine the best options for removing these constraints. The loading on the Martin City 161/69kV transformer, Harrisonville 161/69kV transformer, and the Windsor-Clinton 161kV circuit exceeds the normal ratings on these facilities during contingency outages. Upgrades to the transmission system may be required in that area to eliminate the overload conditions.

Table 4 – Recommended System Improvements for the Customer generation (700MW)
** Costs do not include any adders for CIAC*

Description	Cost
Nashua 345kV substation construction work & transformer	$7,274,000
Total System Improvements Cost	$7,274,000*

3. Analysis - 1100MW

2005 Summer Peak

The study case for the addition of 1100MW peak generation at the Customer substation includes all additional generation with re-dispatch in the KCPL area and transfers to the adjacent control areas. The sink for the 1100MW additions by Customer is the Entergy control area and the transfer is modeled in the study case. Table 5 lists the generation dispatch for the KCPL area and all net transfers to the other affected control areas.

Table 5 – Generation Dispatch and Area Interchange Schedule

Comparison of base case and proposed CUSTOMER plant addition for 2005 summer peak

GENERATION DISPATCH(for KCPL control area)			**INTERCHANGE**		
Plant/Unit	**Base**	**Study**	**Area**	**Base**	**Study**
	w/o CUSTOMER plant	w/ CUSTOMER plant			
Hawthorn 5	560	560	EES	0	1100
Hawthorn 6	45	45	AECI	-150	-150
Hawthorn 7	0	77	SWPA	-5	-5
Hawthorn 8	0	0	GRRD	-15	-15
Hawthorn 9	0	0	MIDW	0	0
Montrose #1	170	170	WERE	141	141
Montrose #2	164	164	MIPU	117	117
Montrose #3	163	153	KACY	35	35
LaCygne#1	688	688	EMDE	80	80
LaCygne#2	674	674	INDN	112	112
Iatan#1	670	670	SPRM	51	51
Northeast N.	0	0	STJO	121	121
Northeast S.	0	0			
Grand Ave	0	0			
Gardner	2	2			
Higginsville	34	34			
Paola Proposed #1	410	410			
Proposed #2	552	552			
Customer	0	1100			

The contingency analysis indicates overloading conditions for numerous 345kV and 161kV facilities including overloads in the base case on the Iatan-St. Joe 345kV circuit, which reaches 104% of capability during normal conditions. With the generation schedules and transactions specified in the study, the additional generation at Customer's site contributes significantly to the flows on the circuit, and the line capability is severely limited by conductor size. Table 6 details these contingencies as well as other overloaded 345kV transmission lines.

Table 6 - 2005 summer peak - Significant 345kV overloaded facilities		
Normal and contingency flows with and without the proposed 1100MW Customer generation		
Monitored line----normal ----------contingency	**Base Case W/o Cust.**	**Analysis Base Case w/ Cust.**
Iatan-St. Joe (normal) - rating: 956MVA	544	996
Base case OL	-	996
LaCygne-Stilwell(normal) – rating:1099MVA	1073	1018
Lang-Swissvale out	1112	-
Lang-Wichita out	1118	-
Stilwell-Swissvale out	1110	-
Benton-Wolf Creek out	1164	-
Neosho-LaCygne out	1153	1143
Rosehill-Wolf Creek out	1156	-
Auburn-Jeffrey EC out	1107	-
Lawrence Hill - Lawr EC out	1124	-
W. Gardner transformer #11 out	1133	-
W. Gardner-Craig out	1440	1278
Prop#2-W. Gardner out	1767	1568
St. Joe-Hawthorn out	1107	-
Craig transformer#11 or #22 out	1119	-
Craig transformer #33 out	1110	-
LaCygne-Prop#2 out	1389	1197
St. Joe Iatan out	1136	-
Morgan-Neosho out	1145	-
Jeffrey EC #1, #2, or #3 out	1138	-
Lawr EC #5 out	1124	
Stranger Creek transformer out	1105	-
Hawthorn #5 out	1161	-
Montrose #1, #2, or #3 out	1112	-
Iatan #1 out	1129	-
Sibley #1 out	1142	-
Pleasant Hill #1, #2, or #3 out	1124	-
Prop#2-W. Gardner(normal) – rating:1099MVA	965	808
Hoyt-Jeffrey EC out	1105	-
Lacygne-Stilwell out	1629	1411
W. Gardner transformer #11 – rating:400MVA	200	216
W. Gardner-Craig out	480	433
Stilwell transformer #11 (normal) – rating: 550MVA	366	347

Stilwell transformer #22 out	559	-

Table 6 (cont'd) - 2005 summer peak - Significant 345kV overloaded facilities		
Normal and contingency flows with and without the proposed 1100MW Customer generation		
Monitored line----normal ----------contingency	**Base Case W/o Cust.**	**Analysis Base Case w/ Cust.**
W. Gardner-Craig (normal) – rating:1099MVA	771	595
LaCygne-Stilwell out	1298	-
Craig transformer #11 (normal) - rating: 550MVA	365	408
Craig transformer #22 out	-	570
Craig transformer #33 (normal) - rating: 400MVA	275	307
Craig transformer #11 out	-	567
Craig transformer #22 out	-	570
Iatan-Stranger Creek (normal) - rating: 1099MVA	236	718
Iatan-St. Joe out	-	1733

An outage of the LaCygne-Stilwell 345kV line causes the loading of the Craig-Lenexa 161kV circuit to reach 109% and the Greenwood-Lenexa 161kV line to reach 103% of capability. Loss of the Craig transformer #11 or #22 causes the loading of the Craig #33 transformer to reach 107%. With a loss of the Craig-Pflumm 161kV circuit, the loading of the Craig-Lenexa line and the Greenwood-Lenexa line reaches 113% and 108% respectively. With the Craig-Cedar Creek line out of service, the loading of the Craig-Lenexa line reaches 110% and the Greenwood-Lenexa line reaches 105% of capability. An outage of the Pflumm-Overland Park circuit results in overloading of the Craig-Lenexa line (111%) and the Greenwood-Lenexa line (106%).

Loss of the Iatan-St. Joe 345kV circuit causes overloading on the Iatan-Stranger Creek 345kV (158%), the Craig-Lenexa 161kV (120%), the Greenwood-Lenexa N. (114%), and the Merriam-Roe Park (104%) circuits. An outage on the Southtown-Forest 161kV circuit results in overload of the Merriam-Roe Park 161kV line (108%). With the Greenwood-Cedar Creek 161kV circuit out of service, the Craig-Lenexa line becomes loaded to 108% of capability and the Greenwood-Lenexa line becomes loaded to 102% of capability.

In the St. Joe Light and Power territory, the loading on the St. Joe-Midway 161kV circuit reaches 102% of normal capability for an outage of the St. Joe-Fairport 345kV line. In the Missouri Public Service area, the Windsor-Clinton circuit loading reaches 108% of normal rating with the Salisbury-Norton line out of service. The Harrisonville 161/69kV transformer becomes loaded to 107% of capability with the Archie-Adrian 161kV line out of service, 106% with a Butler-Adrian line outage, 106% with a Clinton-

Montrose line outage, and 145% with the Pleasant Hill 161/69kV transformer out of service. The loss of the Archie-Adrian line causes overloads on the Montrose-Clinton 161kV line (101%), and the loss of the Warrensburg-Odessa circuit causes overloads on the Windsor-Clinton circuit (105%). The Martin City 161/69kV transformer loading reaches 120% for an outage on the Longview 161/69kV transformer, and 104% for an outage on the Pleasant Hill 161/69kV transformer. Loss of the Warrensburg-Whiteman AFB circuit results in overloading of the Warrensburg 161/69kV transformer (102%).

Proposed Improvements

The addition of 1100MW at the Customer station causes 345kV circuit at Iatan to exhibit contingency overloads. With the transactions and generation schedules specified in this study, the Iatan-St Joe circuit, which is rated for 956MVA, is overloaded under normal operating conditions. With the proposed 1100MW unit, the normal loading on the Iatan-St. Joe line is 1049MVA MVA which is 60% of the total Iatan generation. Construction of a third circuit from Iatan is necessary for the generation interconnection. A new line from Iatan to the Hawthorn-St. Joe circuit at Nashua alleviates the base case overloading of the Iatan-St. Joe line by redirecting 39% of the generation to the new circuit. Under 345kV contingency outages, this new circuit allows power to flow through an alternate delivery path. A 345kV/161kV transformer at Nashua would provide relief of contingency overloading on 161kV circuits in the Hawthorn area but would cause overloading of the new Iatan-Nashua circuit for an outage of the Iatan-St. Joe line. Instead, new circuit construction in the Hawthorn area is recommended to alleviate the overloads on the 161kV system. Construction of a Blue Valley-Crosstown 161kV circuit establishes a new path for the flow of power from the Hawthorn source but involves the substantial cost of underground cable installation. Because of the limited capability of the Iatan-St. Joe 345kV circuit, upgrade of this line is necessary to prevent overloading during contingency outages. The Iatan-St. Joe 345kV line is owned by St. Joe Light and Power and any improvements for the transmission facilities would be made by the owner. Table 7 summarizes the recommended system improvements and associated costs for the work in the KCPL control area. The total estimated cost of the improvements is $26,274,000. The total does not include costs for upgrades to the Iatan-St. Joe line by St. Joe Light & Power.

Table 7 – Recommended System Improvements for the Customer generation (1100MW)
** Costs do not include any adders for CIAC*
***Total cost does not include Iatan-St. Joe line improvements by St. Joe Light & Power*

Description	Cost
Nashua 345kV substation construction work	$4,774,000
New Blue Valley-Crosstown 161kV circuit (6.5 mi.)	$21,500,000
Upgrade of Iatan-St. Joe Line (by SJLP)	
Total System Improvements Cost**	$26,274,000*

4. Interconnection Facilities

The Customer plant will be interconnected with the 345kV transmission system. At an existing KCPL substation, the existing 345kV ring bus will be expanded to accommodate bus positions for the new Customer unit and stop & standby transformer. The additional generation at the Customer site causes contingency violations at the bus of the interconnection. With the proposed generation in service, the total plant output exceeds the capability of either the Iatan-St. Joe circuit (956MVA) or the Iatan-Stranger Creek circuit (1099MVA). Under a contingency outage of one of these lines, the remaining line would become overloaded. A new circuit is required for the interconnection, and the proposed Iatan-Nashua 345kV line offers another path for power flow, eliminating the contingency violations at interconnection bus. The preliminary cost estimates for the facilities are listed in Table 8 below. The amount does not include any additional charges of approximately 25-30% resulting from contribution in aid to construction (CIAC) fees that are to be paid by the requestor. The construction of the interconnection facilities is expected to last 13 months for the station work once zoning and construction permits have been obtained. The planning and construction of the Iatan-Nashua transmission line is expected to last four years including the route selection and right-of-way acquisition issues. The estimated project schedule is included in Tables 9a and 9b.

Table 8 – Summary of Estimated Project Component Costs for Interconnection
** Costs do not include any adders for CIAC*

Item	Description	Cost
1	Substation facilities and equipment	$4,405,000
2	New Iatan-Nashua line (25.0 mi.)	$12,000,000
	Total Project Cost	$16,405,000*

Table 9a – Project Schedule for Interconnection Station Work
Project timeline does not include zoning and construction permits

Task	Description of Work	Start	End
1	Evaluation and budgetary approvals	5/3/04	5/21/04
2	Initial engineering	5/24/04	7/2/04
3	Materials ordering & procurement	7/5/04	2/4/05
4	Final engineering & design	8/30/04	10/22/04
5	Foundation, structural work	11/1/04	1/14/05
6	Transmission line & terminal work	1/17/05	3/4/05
7	Equipment, relay, metering installation	2/21/05	5/13/05
8	Testing and inspection	5/16/05	6/30/05
	Total Project Completion	5/3/04	7/1/05

Table 9b – Project Schedule for Interconnection Transmission Work			
Task	Description of Work	Start	End
1	Route Selection, Right-of-way Acquisition	7/1/01	6/30/03
2	Engineering & Design	4/1/03	7/31/03
3	Material Procurement, Construction	8/1/03	7/4/05
	Total Project Completion	7/1/01	7/1/05

5. Summary

This feasibility study was requested by Customer to assess transmission capacity with the addition of 700MW or 1100MW of new generation in KCPL control area. The analysis evaluates the impact of introducing the new generation on the power system during normal operation and contingency conditions.

The addition of 700MW generating capacity at the proposed site results in the overloading of facilities during outages on the 345kV and 161kV system. A new Iatan-Nashua line required for the plant interconnection allows the transfer of power from the site. Installation of a 345kV/161kV transformer at Nashua provides a new 345/161kV interface on the eastern side of the system and relieves the increased overloading in the Hawthorn area due to contingency events. The estimated cost for the system improvements is $7,274,000.

The addition of 1100MW of generation at the Customer site results in overload conditions in the base case as well as for contingency events. In the base case the Iatan-St. Joe 345kV circuit is loaded beyond capability. With the large amount of generation, extensive upgrades are required to eliminate the transmission facility overloads. Upgrade of the Iatan-St. Joe 345kV line and construction of a new Blue Valley-Crosstown 161kV line in the Hawthorn area in conjunction with the Iatan-Nashua 345kV circuit are necessary to alleviate the system overloads. The estimated cost for the system improvements is $26,274,000.

The proposal to add generation at Customer's site requires facility upgrades at an existing KCPL substation. Bus expansion and additional breaker installations the 345kV ring bus are necessary to accommodate the Customer plant. The cost for the interconnection facilities is estimated to be $16,405,000 less CIAC adders. The project timeline is approximately 13 months for the station construction provided any zoning issues are resolved. The Iatan-Nashua transmission line project timeline is approximately four years including route selection, right-of-way acquisition, engineering and construction. Planning and construction of the interconnection facilities would begin on July 1, 2001 with an anticipated service date of June 1, 2005.

Branch Violations

Table C-1 Base case vs Customer 700MW w/o system improvements

*** MUST 4.00 *** FRI, APR 06 2001 12:31 ***
1-2001 SOUTHWEST POWER POOL POWER FLOW MODEL
2004 SUMMER PEAK (04SP) BASE CASE;WITH MODS (SEE LONG TITLE)

start: 2:29:25 PM
end: 2:47:08 PM
elapsed: 0:17:43

Notes:
Base case vs Customer study with 700MW generation

*****Comparison of Base case flows to Contingency flows*****

Contingency	Monitored Element	Rating	Base Case Normal	Base Case Contingency Flow	Base Case Contingency % of Rating	Study Case Normal	Study Case Contingency Flow	Study Case Contingency % of Rating
56765 HOYT 7 345 56766 JEC N 7 345 1	57965 W.GRDNR7 345 58105 PROP#2 345 1 LN	1099.0	965.0	1104.5	100.5	864.0		
56769 LANG 7 345 56774 SWISVAL7 345 1	57968 STILWEL7 345 57981 LACYGNE7 345 1 LN	1099.0	1073.0	1111.6	101.1	1027.0		
56769 LANG 7 345 56796 WICHITA7 345 1	57968 STILWEL7 345 57981 LACYGNE7 345 1 LN	1099.0	1073.0	1118.1	101.7	1027.0		
56774 SWISVAL7 345 57968 STILWEL7 345 1	57968 STILWEL7 345 57981 LACYGNE7 345 1 LN	1099.0	1073.0	1110.0	101.0	1027.0		
56791 BENTON 7 345 56797 WOLFCRK7 345 1	57968 STILWEL7 345 57981 LACYGNE7 345 1 LN	1099.0	1073.0	1164.0	105.9	1027.0	1119.1	101.8
56793 NEOSHO 7 345 57981 LACYGNE7 345 1	57968 STILWEL7 345 57981 LACYGNE7 345 1 LN	1099.0	1073.0	1153.3	104.9	1027.0	1147.7	104.4
56794 ROSEHIL7 345 56797 WOLFCRK7 345 1	57968 STILWEL7 345 57981 LACYGNE7 345 1 LN	1099.0	1073.0	1156.0	105.2	1027.0	1111.1	101.1
56851 AUBURN 6 230 56852 JEC 6 230 1	57968 STILWEL7 345 57981 LACYGNE7 345 1 LN	1099.0	1073.0	1106.9	100.7	1027.0		
56853 LAWHILL6 230 56854 LEC U5 6 230 1	57968 STILWEL7 345 57981 LACYGNE7 345 1 LN	1099.0	1073.0	1124.4	102.3	1027.0		
56853 LAWHILL6 230 56855 MIDLAND6 230 1	56853 LAWHILL6 230 57250 LWRNCHL3 115 1 TR	280.0	237.0	356.5	127.3	231.0	346.4	123.7
57965 W.GRDNR7 345 57966 WGARDNR5 161 11	57968 STILWEL7 345 57981 LACYGNE7 345 1 LN	1099.0	1073.0	1133.1	103.1	1027.0		
57965 W.GRDNR7 345 57977 CRAIG 7 345 1	58042 SPRGHL 5 161 57267 SPRINGH3 115 1 TR	100.0	87.0	100.6	100.6	81.0		
	57965 W.GRDNR7 345 57966 WGARDNR5 161 11 TR	400.0	200.0	479.9	120.0	210.0	449.6	112.4
	57966 WGARDNR5 161 58044 MOONLT 5 161 1 LN	293.0	220.0	435.4	148.6	218.0	399.9	136.5
	57968 STILWEL7 345 57981 LACYGNE7 345 1 LN	1099.0	1073.0	1440.3	131.1	1027.0	1336.8	121.6
	57969 STILWEL5 161 58053 REDEL 5 161 1 LN	293.0	270.0	312.2	106.5	263.0	297.7	101.6
	57969 STILWEL5 161 58057 BUCYRUS5 161 1 LN	224.0	178.0	226.5	101.1	167.0		
	58037 OLATHEW5 161 58043 MURLEN 5 161 1 LN	293.0	122.0	339.2	115.8	119.0	303.8	103.7
	58043 MURLEN 5 161 58044 MOONLT 5 161 1 LN	293.0	179.0	397.1	135.5	177.0	361.5	123.4
57965 W.GRDNR7 345 58105 PROP#2 345 1	58042 SPRGHL 5 161 57267 SPRINGH3 115 1 TR	100.0	87.0	101.1	101.1	81.0		
	57995 MONTROS5 161 57954 MONTG3 118.0 1 TR	175.0	168.0	177.0	101.2	161.0		
	57968 STILWEL7 345 57981 LACYGNE7 345 1 LN	1099.0	1073.0	1767.0	160.8	1027.0	1639.8	149.2

	57969 STILWEL5 161 58053 REDEL 5 161 1	LN	293.0	270.0	314.2	107.2	263.0	301.2	102.8
	57993 STHTOWN5 161 59210 MARTCTY5 161 1	LN	224.0	163.0	245.3	109.5	142.0		
	58036 OLATHEE5 161 58046 OXFORD 5 161 1	LN	293.0	156.0	354.4	121.0	124.0	299.4	102.2
57966 WGARDNR5 161 58044 MOONLT 5 161 1	57968 STILWEL7 345 57981 LACYGNE7 345 1	LN	1099.0	1073.0	1129.7	102.8	1027.0		
57968 STILWEL7 345 57969 STILWEL5 161 22	57968 STILWEL7 345 57969 STILWEL5 161 11	TR	550.0	366.0	559.4	101.7	354.0		
57968 STILWEL7 345 57981 LACYGNE7 345 1	57995 MONTROS5 161 57954 MONTG3 118.0 1	TR	175.0	168.0	176.1	100.6	161.0		
	57965 W.GRDNR7 345 57977 CRAIG 7 345 1	LN	1099.0	771.0	1297.8	118.1	658.0	1154.0	105.0
	57965 W.GRDNR7 345 58105 PROP#2 345 1	LN	1099.0	965.0	1628.7	148.2	864.0	1489.6	135.5
	57966 WGARDNR5 161 58044 MOONLT 5 161 1	LN	293.0	220.0	304.7	104.0	218.0	297.8	101.6
	57969 STILWEL5 161 58057 BUCYRUS5 161 1	LN	224.0	178.0	260.5	116.3	167.0	245.0	109.4
	57978 CRAIG 5 161 58039 LENEXAN5 161 1	LN	293.0	241.0	308.9	105.4	252.0	315.8	107.8
	58067 CENTENL5 161 58068 WAGSTAF5 161 1	LN	293.0	210.0	296.1	101.1	199.0		
	58031 GRNWOOD5 161 58039 LENEXAN5 161 1	LN	293.0	223.0			234.0	299.2	102.1
57968 STILWEL7 345 59200 PHILL 7 345 1	57969 STILWEL5 161 58053 REDEL 5 161 1	LN	293.0	270.0	350.1	119.5	263.0	342.3	116.8
	58002 MARTCIT5 161 58053 REDEL 5 161 1	LN	293.0	232.0	315.8	107.8	225.0	308.0	105.1
	59239 HSNVL 5 161 59295 HSNVL 269.0 1	TR	50.0	50.0	51.3	102.7	49.0	51.0	102.0
57969 STILWEL5 161 57994 HICKMAN5 161 1	57969 STILWEL5 161 58053 REDEL 5 161 1	LN	293.0	270.0	328.2	112.0	263.0	317.2	108.3
	57993 STHTOWN5 161 59210 MARTCTY5 161 1	LN	224.0	163.0	234.8	104.8	142.0		
	59239 HSNVL 5 161 59295 HSNVL 269.0 1	TR	50.0	50.0	50.6	101.1	49.0		
57969 STILWEL5 161 58050 ANTIOCH5 161 1	57969 STILWEL5 161 58053 REDEL 5 161 1	LN	293.0	270.0	314.9	107.5	263.0	301.5	102.9
	59239 HSNVL 5 161 59295 HSNVL 269.0 1	TR	50.0	50.0	50.6	101.2	49.0		
57969 STILWEL5 161 58053 REDEL 5 161 1	59239 HSNVL 5 161 59295 HSNVL 269.0 1	TR	50.0	50.0	52.5	105.1	49.0	52.1	104.3
57969 STILWEL5 161 58057 BUCYRUS5 161 1	57968 STILWEL7 345 57981 LACYGNE7 345 1	LN	1099.0	1073.0	1139.1	103.7	1027.0		
69702 ST JOE 3 345 57972 HAWTH 7 345 1	57968 STILWEL7 345 57981 LACYGNE7 345 1	LN	1099.0	1073.0	1106.9	100.7	1027.0		
57973 HAWTHRN5 161 57976 LEVEE 5 161 1	57973 HAWTHRN5 161 58011 CHOUTEU5 161 1	LN	293.0	209.0	312.3	106.6	202.0		
	57973 HAWTHRN5 161 58027 RANDLPH5 161 1	LN	293.0	244.0	300.1	102.4	236.0		
57973 HAWTHRN5 161 58011 CHOUTEU5 161 1	57973 HAWTHRN5 161 57976 LEVEE 5 161 1	LN	293.0	217.0	319.4	109.0	172.0		
	57973 HAWTHRN5 161 58027 RANDLPH5 161 1	LN	293.0	244.0	296.1	101.1	236.0		
	57976 LEVEE 5 161 57985 NEAST 5 161 1	LN	293.0	217.0	319.6	109.1	209.0	307.4	104.9
57973 HAWTHRN5 161 58027 RANDLPH5 161 1	57973 HAWTHRN5 161 57976 LEVEE 5 161 1	LN	293.0	217.0	305.3	104.2	172.0		
	57976 LEVEE 5 161 57985 NEAST 5 161 1	LN	293.0	217.0	305.5	104.3	209.0		
57976 LEVEE 5 161 57985 NEAST 5 161 1	57973 HAWTHRN5 161 58011 CHOUTEU5 161 1	LN	293.0	209.0	312.4	106.6	202.0	300.3	102.5
	57973 HAWTHRN5 161 58027 RANDLPH5 161 1	LN	293.0	244.0	300.1	102.4	236.0		
57977 CRAIG 7 345 57978 CRAIG 5 161 11	57968 STILWEL7 345 57981 LACYGNE7 345 1	LN	1099.0	1073.0	1118.5	101.8	1027.0		
	57977 CRAIG 7 345 57978 CRAIG 5 161 33	TR	400.0	275.0			296.0	415.4	103.9
57977 CRAIG 7 345 57978 CRAIG 5 161 22	57968 STILWEL7 345 57981 LACYGNE7 345 1	LN	1099.0	1073.0	1118.1	101.7	1027.0		

	57977 CRAIG 7 345	57978 CRAIG 5 161	33	TR	400.0	275.0			296.0	413.9	103.5
57977 CRAIG 7 345 57978 CRAIG 5 161	33	57968 STILWEL7 345	57981 LACYGNE7 345	1	LN	1099.0	1073.0	1109.8	101.0	1027.0		
57978 CRAIG 5 161 57979 PFLUMM 5 161	1	57968 STILWEL7 345	57981 LACYGNE7 345	1	LN	1099.0	1073.0	1106.9	100.7	1027.0		
		57978 CRAIG 5 161	58039 LENEXAN5 161	1	LN	293.0	241.0	311.9	106.5	252.0	326.2	111.3
		58031 GRNWOOD5 161	58039 LENEXAN5 161	1	LN	293.0	223.0	295.2	100.7	234.0	309.4	105.6
57978 CRAIG 5 161 58049 CEDRCRK5 161	1	57978 CRAIG 5 161	58039 LENEXAN5 161	1	LN	293.0	241.0	305.1	104.1	252.0	317.6	108.4
		58031 GRNWOOD5 161	58039 LENEXAN5 161	1	LN	293.0	223.0			234.0	301.0	102.7
57979 PFLUMM 5 161 58047 OVERLPK5 161	1	57968 STILWEL7 345	57981 LACYGNE7 345	1	LN	1099.0	1073.0	1105.5	100.6	1027.0		
		57978 CRAIG 5 161	58039 LENEXAN5 161	1	LN	293.0	241.0	306.0	104.4	252.0	320.3	109.3
		58031 GRNWOOD5 161	58039 LENEXAN5 161	1	LN	293.0	223.0			234.0	303.6	103.6
57981 LACYGNE7 345 58105 PROP#2 345	1	57968 STILWEL7 345	57981 LACYGNE7 345	1	LN	1099.0	1073.0	1388.7	126.4	1027.0	1266.5	115.2
69702 ST JOE 3 345 57982 IATAN 7 345	1	57968 STILWEL7 345	57981 LACYGNE7 345	1	LN	1099.0	1073.0	1135.7	103.3	1027.0	1114.7	101.4
		56772 STRANGR7 345	57982 IATAN 7 345	1	LN	1099.0	236.0			528.0	1363.4	123.8
		57978 CRAIG 5 161	58039 LENEXAN5 161	1	LN	293.0	241.0			252.0	330.3	112.7
		58031 GRNWOOD5 161	58039 LENEXAN5 161	1	LN	293.0	223.0			234.0	313.7	107.1
57985 NEAST 5 161 58011 CHOUTEU5 161	1	57973 HAWTHRN5 161	57976 LEVEE 5 161	1	LN	293.0	217.0	308.5	105.3	172.0		
		57976 LEVEE 5 161	57985 NEAST 5 161	1	LN	293.0	217.0	308.7	105.4	209.0	296.5	101.2
57993 STHTOWN5 161 57994 HICKMAN5 161	1	57969 STILWEL5 161	58053 REDEL 5 161	1	LN	293.0	270.0	311.2	106.2	263.0	300.3	102.5
		59239 HSNVL 5 161	59295 HSNVL 269.0	1	TR	50.0	50.0	50.4	100.8	49.0		
57993 STHTOWN5 161 58001 FOREST 5 161	1	58032 MERRIAM5 161	58040 ROEPARK5 161	1	LN	187.0	79.0	190.5	101.9	97.0	198.4	106.1
57995 MONTROS5 161 58013 HARSNVL5 161	1	59239 HSNVL 5 161	59295 HSNVL 269.0	1	TR	50.0	50.0	50.3	100.6	49.0		
57995 MONTROS5 161 58013 HARSNVL5 161	2	59239 HSNVL 5 161	59295 HSNVL 269.0	1	TR	50.0	50.0	50.3	100.6	49.0		
57998 LVISTAE5 161 58013 HARSNVL5 161	1	59239 HSNVL 5 161	59295 HSNVL 269.0	1	TR	50.0	50.0	50.3	100.6	49.0		
57999 LVISTAW5 161 58008 BUNKRDG5 161	1	59239 HSNVL 5 161	59295 HSNVL 269.0	1	TR	50.0	50.0	50.2	100.5	49.0		
57999 LVISTAW5 161 58013 HARSNVL5 161	1	59239 HSNVL 5 161	59295 HSNVL 269.0	1	TR	50.0	50.0	50.3	100.6	49.0		
58002 MARTCIT5 161 58053 REDEL 5 161	1	59239 HSNVL 5 161	59295 HSNVL 269.0	1	TR	50.0	50.0	52.2	104.3	49.0	51.8	103.5
58002 MARTCIT5 161 59210 MARTCTY5 161	1	59239 HSNVL 5 161	59295 HSNVL 269.0	1	TR	50.0	50.0	51.7	103.5	49.0	51.3	102.7
58015 AVONDAL5 161 58027 RANDLPH5 161	1	57973 HAWTHRN5 161	57976 LEVEE 5 161	1	LN	293.0	217.0	297.4	101.5	172.0		
		57976 LEVEE 5 161	57985 NEAST 5 161	1	LN	293.0	217.0	297.5	101.5	209.0		
58031 GRNWOOD5 161 58049 CEDRCRK5 161	1	57978 CRAIG 5 161	58039 LENEXAN5 161	1	LN	293.0	241.0	297.9	101.7	252.0	310.4	105.9
58036 OLATHEE5 161 58046 OXFORD 5 161	1	57969 STILWEL5 161	58053 REDEL 5 161	1	LN	293.0	270.0	295.8	101.0	263.0		
		59239 HSNVL 5 161	59295 HSNVL 269.0	1	TR	50.0	50.0	50.4	100.7	49.0		

58037 OLATHEW5 161	58043 MURLEN 5 161	1	57968 STILWEL7 345	57981 LACYGNE7 345	1	LN	1099.0	1073.0	1112.3	101.2	1027.0		
58043 MURLEN 5 161	58044 MOONLT 5 161	1	57968 STILWEL7 345	57981 LACYGNE7 345	1	LN	1099.0	1073.0	1122.8	102.2	1027.0		
58046 OXFORD 5 161	58050 ANTIOCH5 161	1	57969 STILWEL5 161	58053 REDEL 5 161	1	LN	293.0	270.0	309.0	105.4	263.0	295.6	100.9
			59239 HSNVL 5 161	59295 HSNVL 269.0	1	TR	50.0	50.0	50.5	101.1	49.0		
58057 BUCYRUS5 161	58068 WAGSTAF5 161	1	57968 STILWEL7 345	57981 LACYGNE7 345	1	LN	1099.0	1073.0	1148.5	104.5	1027.0		
			58066 S.OTTWA5 161	58077 SRICHLN5 161	1	LN	174.0	65.0	189.9	109.1	53.0		
58062 SALSBRY5 161	58064 NORTON-5 161	1	59217 WINDSR 5 161	96071 5CLINTN 161	1	LN	123.0	95.0	126.2	102.6	101.0	130.5	106.1
			59239 HSNVL 5 161	59295 HSNVL 269.0	1	TR	50.0	50.0	50.4	100.8	49.0		
58066 S.OTTWA5 161	58069 PAOLA 5 161	1	57969 STILWEL5 161	58057 BUCYRUS5 161	1	LN	224.0	178.0	258.8	115.5	167.0	237.4	106.0
58067 CENTENL5 161	58068 WAGSTAF5 161	1	57968 STILWEL7 345	57981 LACYGNE7 345	1	LN	1099.0	1073.0	1150.5	104.7	1027.0		
			58066 S.OTTWA5 161	58077 SRICHLN5 161	1	LN	174.0	65.0	193.9	111.4	53.0		
58067 CENTENL5 161	58069 PAOLA 5 161	1	57968 STILWEL7 345	57981 LACYGNE7 345	1	LN	1099.0	1073.0	1159.4	105.5	1027.0	1107.0	100.7
			58066 S.OTTWA5 161	58077 SRICHLN5 161	1	LN	174.0	65.0	211.4	121.5	53.0	191.2	109.9
59200 PHILL 7 345	59225 PHILL 5 161	1	59239 HSNVL 5 161	59295 HSNVL 269.0	1	TR	50.0	50.0	50.6	101.1	49.0	50.3	100.5
59202 SIBLEY 5 161	59235 DUNCAN 5 161	1	59239 HSNVL 5 161	59295 HSNVL 269.0	1	TR	50.0	50.0	50.3	100.6	49.0		
59202 SIBLEY 5 161	59244 ORRICK 5 161	1	59239 HSNVL 5 161	59295 HSNVL 269.0	1	TR	50.0	50.0	50.4	100.8	49.0		
59205 BLSPE 5 161	59227 OAKGRV 5 161	1	59239 HSNVL 5 161	59295 HSNVL 269.0	1	TR	50.0	50.0	50.4	100.7	49.0		
59206 PRALEE 5 161	59233 LEESUM 5 161	1	59239 HSNVL 5 161	59295 HSNVL 269.0	1	TR	50.0	50.0	50.4	100.8	49.0		
59207 ARCHIE 5 161	59240 ADRIAN 5 161	1	59239 HSNVL 5 161	59295 HSNVL 269.0	1	TR	50.0	50.0	53.4	106.8	49.0	53.5	107.1
59208 NEVADA 5 161	59216 BUTLER_5 161	1	59239 HSNVL 5 161	59295 HSNVL 269.0	1	TR	50.0	50.0	51.3	102.6	49.0	51.3	102.6
59209 SEDALIA5 161	59217 WINDSR 5 161	1	59239 HSNVL 5 161	59295 HSNVL 269.0	1	TR	50.0	50.0	50.9	101.9	49.0	50.7	101.4
59216 BUTLER_5 161	59240 ADRIAN 5 161	1	59239 HSNVL 5 161	59295 HSNVL 269.0	1	TR	50.0	50.0	52.8	105.5	49.0	52.9	105.8
59218 GRNWD 5 161	59233 LEESUM 5 161	1	59239 HSNVL 5 161	59295 HSNVL 269.0	1	TR	50.0	50.0	50.6	101.1	49.0	50.2	100.5
59224 LNGVW 5 161	59249 HOOKRD 5 161	1	57969 STILWEL5 161	58053 REDEL 5 161	1	LN	293.0	270.0	321.2	109.6	263.0	312.3	106.6
			59239 HSNVL 5 161	59295 HSNVL 269.0	1	TR	50.0	50.0	51.9	103.9	49.0	51.5	103.1
59225 PHILL 5 161	59243 LKWINGB5 161	1	57969 STILWEL5 161	58053 REDEL 5 161	1	LN	293.0	270.0	328.3	112.0	263.0	319.4	109.0
			59239 HSNVL 5 161	59295 HSNVL 269.0	1	TR	50.0	50.0	52.3	104.5	49.0	51.8	103.7
59227 OAKGRV 5 161	59229 ODESSA 5 161	1	59239 HSNVL 5 161	59295 HSNVL 269.0	1	TR	50.0	50.0	50.2	100.5	49.0		
59228 WBURGE 5 161	59229 ODESSA 5 161	1	59239 HSNVL 5 161	59295 HSNVL 269.0	1	TR	50.0	50.0	50.4	100.9	49.0	50.2	100.5

59236 RICHMND5 161	59244 ORRICK 5 161	1	59239 HSNVL 5 161	59295 HSNVL 269.0	1	TR	50.0	50.0	50.3	100.7	49.0		
59243 LKWINGB5 161	59249 HOOKRD 5 161	1	57969 STILWEL5 161	58053 REDEL 5 161	1	LN	293.0	270.0	323.9	110.6	263.0	315.0	107.5
			59239 HSNVL 5 161	59295 HSNVL 269.0	1	TR	50.0	50.0	52.1	104.1	49.0	51.7	103.3
96045 7MORGAN 345	56793 NEOSHO 7 345	1	57968 STILWEL7 345	57981 LACYGNE7 345	1	LN	1099.0	1073.0	1144.9	104.2	1027.0	1104.5	100.5
96071 5CLINTN 161	57995 MONTROS5 161	1	59239 HSNVL 5 161	59295 HSNVL 269.0	1	TR	50.0	50.0	53.0	105.9	49.0	53.0	106.0
96071 5CLINTN 161	59217 WINDSR 5 161	1	59239 HSNVL 5 161	59295 HSNVL 269.0	1	TR	50.0	50.0	51.0	102.1	49.0	50.8	101.5
96071 5CLINTN 161	59242 CLINTON5 161	1	59228 WBURGE 5 161	59269 WBURGE 269.0	1	TR	50.0	44.0	69.6	139.2	44.0	69.3	138.5
			59239 HSNVL 5 161	59295 HSNVL 269.0	1	TR	50.0	50.0	51.8	103.6	49.0	51.5	102.9
96689 2BUTLER 69.0	59216 BUTLER_5 161	1	59239 HSNVL 5 161	59295 HSNVL 269.0	1	TR	50.0	50.0	50.6	101.2	49.0	50.3	100.6
56651 JEC U1 26.0	56852 JEC 6 230	1	57968 STILWEL7 345	57981 LACYGNE7 345	1	LN	1099.0	1073.0	1138.1	103.6	1027.0		
56652 JEC U2 26.0	56766 JEC N 7 345	1	57968 STILWEL7 345	57981 LACYGNE7 345	1	LN	1099.0	1073.0	1134.4	103.2	1027.0		
56653 JEC U3 26.0	56766 JEC N 7 345	1	57968 STILWEL7 345	57981 LACYGNE7 345	1	LN	1099.0	1073.0	1134.4	103.2	1027.0		
56663 LEC U5 24.0	56854 LEC U5 6 230	1	57968 STILWEL7 345	57981 LACYGNE7 345	1	LN	1099.0	1073.0	1124.4	102.3	1027.0		
56772 STRANGR7 345	56811 STRANG7X1.00	1	58042 SPRGHL 5 161	57267 SPRINGH3 115	1	TR	100.0	87.0	100.9	100.9	81.0		
			57968 STILWEL7 345	57981 LACYGNE7 345	1	LN	1099.0	1073.0	1105.3	100.6	1027.0		
56853 LAWHILL6 230	57250 LWRNCHL3 115	1	56855 MIDLAND6 230	57252 MIDLAND3 115	1	TR	280.0	172.0	319.2	114.0	168.0	310.1	110.7
56855 MIDLAND6 230	57252 MIDLAND3 115	1	56853 LAWHILL6 230	57250 LWRNCHL3 115	1	TR	280.0	237.0	356.5	127.3	231.0	346.5	123.7
57951 HAW G5 122.0	57973 HAWTHRN5 161	1	57995 MONTROS5 161	57954 MONTG3 118.0	1	TR	175.0	168.0	176.2	100.7	161.0		
			57968 STILWEL7 345	57981 LACYGNE7 345	1	LN	1099.0	1073.0	1160.7	105.6	1027.0	1110.5	101.0
57952 MONTG1 122.0	57995 MONTROS5 161	1	57995 MONTROS5 161	57954 MONTG3 118.0	1	TR	175.0	168.0	179.0	102.3	161.0		
			57968 STILWEL7 345	57981 LACYGNE7 345	1	LN	1099.0	1073.0	1112.5	101.2	1027.0		
57953 MONTG2 122.0	57995 MONTROS5 161	1	57995 MONTROS5 161	57954 MONTG3 118.0	1	TR	175.0	168.0	178.9	102.3	161.0		
			57968 STILWEL7 345	57981 LACYGNE7 345	1	LN	1099.0	1073.0	1111.8	101.2	1027.0		
57954 MONTG3 118.0	57995 MONTROS5 161	1	57968 STILWEL7 345	57981 LACYGNE7 345	1	LN	1099.0	1073.0	1111.6	101.1	1027.0		
57957 IAT G1 124.0	57982 IATAN 7 345	1	57968 STILWEL7 345	57981 LACYGNE7 345	1	LN	1099.0	1073.0	1128.7	102.7	1027.0		
59151 SIBLEY#322.0	59202 SIBLEY 5 161	1	57968 STILWEL7 345	57981 LACYGNE7 345	1	LN	1099.0	1073.0	1141.5	103.9	1027.0		
			59239 HSNVL 5 161	59295 HSNVL 269.0	1	TR	50.0	50.0	50.4	100.9	49.0		
59162 ARIESSTG18.0	59225 PHILL 5 161	1	57968 STILWEL7 345	57981 LACYGNE7 345	1	LN	1099.0	1073.0	1124.3	102.3	1027.0		
59163 ARIESCT118.0	59225 PHILL 5 161	1	57968 STILWEL7 345	57981 LACYGNE7 345	1	LN	1099.0	1073.0	1115.8	101.5	1027.0		

59164	ARIESCT2	18.0	59225	PHILL	5 161	1	57968	STILWEL7	345	57981	LACYGNE7	345	1	LN	1099.0	1073.0	1115.8	101.5	1027.0		
59208	NEVADA	5 161	59308	NEVADA	269.0	1	59208	NEVADA	5 161	59308	NEVADA	269.0	2	TR	50.0	26.0	50.4	100.9	26.0		
59208	NEVADA	5 161	59308	NEVADA	269.0	2	59208	NEVADA	5 161	59308	NEVADA	269.0	1	TR	50.0	30.0	51.8	103.6	30.0	51.2	102.3
59209	SEDALIA5	161	59271	SEDN	269.0	1	59209	SEDALIA5	161	59272	SEDS	269.0	1	TR	50.0	29.0	51.9	103.8	28.0	50.8	101.7
							59228	WBURGE	5 161	59269	WBURGE	269.0	1	TR	50.0	44.0	52.4	104.8	44.0	52.0	104.1
							59239	HSNVL	5 161	59295	HSNVL	269.0	1	TR	50.0	50.0	50.3	100.5	49.0		
59209	SEDALIA5	161	59272	SEDS	269.0	1	59209	SEDALIA5	161	59271	SEDN	269.0	1	TR	50.0	35.0	55.6	111.2	35.0	54.6	109.2
							59228	WBURGE	5 161	59269	WBURGE	269.0	1	TR	50.0	44.0	50.9	101.8	44.0	50.5	101.1
59210	MARTCTY5	161	59287	MARTCTY	269.0	1	59239	HSNVL	5 161	59295	HSNVL	269.0	1	TR	50.0	50.0	55.4	110.8	49.0	55.2	110.4
59224	LNGVW	5 161	59282	LNGVW	269.0	1	59210	MARTCTY5	161	59287	MARTCTY	269.0	1	TR	50.0	38.0	57.8	115.6	39.0	59.1	118.1
							59239	HSNVL	5 161	59295	HSNVL	269.0	1	TR	50.0	50.0	56.1	112.2	49.0	55.8	111.6
59225	PHILL	5 161	59280	PHILL	269.0	1	59228	WBURGE	5 161	59269	WBURGE	269.0	1	TR	50.0	44.0	52.8	105.5	44.0	52.7	105.4
							59239	HSNVL	5 161	59295	HSNVL	269.0	1	TR	50.0	50.0	72.4	144.8	49.0	72.5	144.9
							59210	MARTCTY5	161	59287	MARTCTY	269.0	1	TR	50.0	38.0			39.0	51.1	102.3
59228	WBURGE	5 161	59269	WBURGE	269.0	1	59239	HSNVL	5 161	59295	HSNVL	269.0	1	TR	50.0	50.0	51.5	103.1	49.0	51.2	102.4
59232	LEX161	5 161	59264	LEX69	269.0	1	59239	HSNVL	5 161	59295	HSNVL	269.0	1	TR	50.0	50.0	50.3	100.6	49.0		
59242	CLINTON5	161	59303	CLINTON	269.0	1	59239	HSNVL	5 161	59295	HSNVL	269.0	1	TR	50.0	50.0	50.3	100.7	49.0		
							59242	CLINTON5	161	59303	CLINTON	269.0	2	TR	50.0	36.0	56.2	112.4	36.0	55.8	111.5
59242	CLINTON5	161	59303	CLINTON	269.0	2	59239	HSNVL	5 161	59295	HSNVL	269.0	1	TR	50.0	50.0	50.3	100.6	49.0		
							59242	CLINTON5	161	59303	CLINTON	269.0	1	TR	50.0	35.0	56.5	113.0	35.0	56.1	112.2
56772	STRANGR7	345	57977	CRAIG	7 345	1	57982	IATAN	7 345	69702	ST JOE 3	345	1	LN	956.0	544.0			850.0	1003.3	105.0
56772	STRANGR7	345	57982	IATAN	7 345	1	57982	IATAN	7 345	69702	ST JOE 3	345	1	LN	956.0	544.0			850.0	1318.4	137.9

Branch Violations

Table C-2 Base case vs Customer 700MW w/ Iatan-Nashua line and Nashua Transformer

*** MUST 4.00 *** FRI, APR 06 2001 12:31 ***
1-2001 SOUTHWEST POWER POOL POWER FLOW MODEL
2004 SUMMER PEAK (04SP) BASE CASE;WITH MODS (SEE LONG TITLE)

start: 2:29:21 PM
end: 2:59:47 PM
elapsed: 0:30:26

Notes:

Base case vs Customer study with 700MW generation including Iatan-Nashua line and Nashua transformer

*****Comparison of Base case flows to Contingency flows*****

Contingency	Monitored Element	Rating	Base Case			Study Case		
			Normal	Contingency Flow	Contingency % of Rating	Normal	Contingency Flow	Contingency % of Rating
56765 HOYT 7 345 56766 JEC N 7 345 1	57965 W.GRDNR7 345 58105 PROP#2 345 1 LN	1099.0	965.0	1104.5	100.5	891.0		
56769 LANG 7 345 56774 SWISVAL7 345 1	57968 STILWEL7 345 57981 LACYGNE7 345 1 LN	1099.0	1073.0	1111.6	101.1	998.0		
56769 LANG 7 345 56796 WICHITA7 345 1	57968 STILWEL7 345 57981 LACYGNE7 345 1 LN	1099.0	1073.0	1118.1	101.7	998.0		
56774 SWISVAL7 345 57968 STILWEL7 345 1	57968 STILWEL7 345 57981 LACYGNE7 345 1 LN	1099.0	1073.0	1110.0	101.0	998.0		
56791 BENTON 7 345 56797 WOLFCRK7 345 1	57968 STILWEL7 345 57981 LACYGNE7 345 1 LN	1099.0	1073.0	1164.0	105.9	998.0		
56793 NEOSHO 7 345 57981 LACYGNE7 345 1	57968 STILWEL7 345 57981 LACYGNE7 345 1 LN	1099.0	1073.0	1153.3	104.9	998.0	1114.2	101.4
56794 ROSEHIL7 345 56797 WOLFCRK7 345 1	57968 STILWEL7 345 57981 LACYGNE7 345 1 LN	1099.0	1073.0	1156.0	105.2	998.0		
56851 AUBURN 6 230 56852 JEC 6 230 1	57968 STILWEL7 345 57981 LACYGNE7 345 1 LN	1099.0	1073.0	1106.9	100.7	998.0		
56853 LAWHILL6 230 56854 LEC U5 6 230 1	57968 STILWEL7 345 57981 LACYGNE7 345 1 LN	1099.0	1073.0	1124.4	102.3	998.0		
56853 LAWHILL6 230 56855 MIDLAND6 230 1	56853 LAWHILL6 230 57250 LWRNCHL3 115 1 TR	280.0	237.0	356.5	127.3	230.0	344.6	123.1
57965 W.GRDNR7 345 57966 WGARDNR5 161 11	57968 STILWEL7 345 57981 LACYGNE7 345 1 LN	1099.0	1073.0	1133.1	103.1	998.0		
57965 W.GRDNR7 345 57977 CRAIG 7 345 1	58042 SPRGHL 5 161 57267 SPRINGH3 115 1 TR	100.0	87.0	100.6	100.6	83.0		
	57965 W.GRDNR7 345 57966 WGARDNR5 161 11 TR	400.0	200.0	479.9	120.0	199.0	450.7	112.7
	57966 WGARDNR5 161 58044 MOONLT 5 161 1 LN	293.0	220.0	435.4	148.6	210.0	402.1	137.2
	57968 STILWEL7 345 57981 LACYGNE7 345 1 LN	1099.0	1073.0	1440.3	131.1	998.0	1324.4	120.5
	57969 STILWEL5 161 58053 REDEL 5 161 1 LN	293.0	270.0	312.2	106.5	250.0		
	57969 STILWEL5 161 58057 BUCYRUS5 161 1 LN	224.0	178.0	226.5	101.1	164.0		
	58037 OLATHEW5 161 58043 MURLEN 5 161 1 LN	293.0	122.0	339.2	115.8	112.0	306.5	104.6
	58043 MURLEN 5 161 58044 MOONLT 5 161 1 LN	293.0	179.0	397.1	135.5	170.0	363.8	124.2
57965 W.GRDNR7 345 58105 PROP#2 345 1	58042 SPRGHL 5 161 57267 SPRINGH3 115 1 TR	100.0	87.0	101.1	101.1	83.0		
	57995 MONTROS5 161 57954 MONTG3 118.0 1 TR	175.0	168.0	177.0	101.2	153.0		
	57968 STILWEL7 345 57981 LACYGNE7 345 1 LN	1099.0	1073.0	1767.0	160.8	998.0	1628.3	148.2

			57969 STILWEL5 161	58053 REDEL 5 161	1	LN	293.0	270.0	314.2	107.2	250.0		
			57993 STHTOWN5 161	59210 MARTCTY5 161	1	LN	224.0	163.0	245.3	109.5	138.0		
			58036 OLATHEE5 161	58046 OXFORD 5 161	1	LN	293.0	156.0	354.4	121.0	136.0	313.6	107.0
57966 WGARDNR5 161	58044 MOONLT 5 161	1	57968 STILWEL7 345	57981 LACYGNE7 345	1	LN	1099.0	1073.0	1129.7	102.8	998.0		
57968 STILWEL7 345	57969 STILWEL5 161	22	57968 STILWEL7 345	57969 STILWEL5 161	11	TR	550.0	366.0	559.4	101.7	349.0		
57968 STILWEL7 345	57981 LACYGNE7 345	1	57995 MONTROS5 161	57954 MONTG3 118.0	1	TR	175.0	168.0	176.1	100.6	153.0		
			57965 W.GRDNR7 345	57977 CRAIG 7 345	1	LN	1099.0	771.0	1297.8	118.1	697.0	1182.7	107.6
			57965 W.GRDNR7 345	58105 PROP#2 345	1	LN	1099.0	965.0	1628.7	148.2	891.0	1498.5	136.3
			57966 WGARDNR5 161	58044 MOONLT 5 161	1	LN	293.0	220.0	304.7	104.0	210.0		
			57969 STILWEL5 161	58057 BUCYRUS5 161	1	LN	224.0	178.0	260.5	116.3	164.0	237.0	105.8
			57978 CRAIG 5 161	58039 LENEXAN5 161	1	LN	293.0	241.0	308.9	105.4	214.0		
			58067 CENTENL5 161	58068 WAGSTAF5 161	1	LN	293.0	210.0	296.1	101.1	195.0		
57968 STILWEL7 345	59200 PHILL 7 345	1	57969 STILWEL5 161	58053 REDEL 5 161	1	LN	293.0	270.0	350.1	119.5	250.0	315.3	107.6
			58002 MARTCIT5 161	58053 REDEL 5 161	1	LN	293.0	232.0	315.8	107.8	212.0		
			59239 HSNVL 5 161	59295 HSNVL 269.0	1	TR	50.0	50.0	51.3	102.7	49.0	50.6	101.3
57969 STILWEL5 161	57994 HICKMAN5 161	1	57969 STILWEL5 161	58053 REDEL 5 161	1	LN	293.0	270.0	328.2	112.0	250.0	300.6	102.6
			57993 STHTOWN5 161	59210 MARTCTY5 161	1	LN	224.0	163.0	234.8	104.8	138.0		
			59239 HSNVL 5 161	59295 HSNVL 269.0	1	TR	50.0	50.0	50.6	101.1	49.0		
57969 STILWEL5 161	58050 ANTIOCH5 161	1	57969 STILWEL5 161	58053 REDEL 5 161	1	LN	293.0	270.0	314.9	107.5	250.0		
			59239 HSNVL 5 161	59295 HSNVL 269.0	1	TR	50.0	50.0	50.6	101.2	49.0		
57969 STILWEL5 161	58053 REDEL 5 161	1	59239 HSNVL 5 161	59295 HSNVL 269.0	1	TR	50.0	50.0	52.5	105.1	49.0	51.9	103.7
57969 STILWEL5 161	58057 BUCYRUS5 161	1	57968 STILWEL7 345	57981 LACYGNE7 345	1	LN	1099.0	1073.0	1139.1	103.7	998.0		
69702 ST JOE 3 345	57972 HAWTH 7 345	1	57968 STILWEL7 345	57981 LACYGNE7 345	1	LN	1099.0	1073.0	1106.9	100.7	998.0		
57973 HAWTHRN5 161	57976 LEVEE 5 161	1	57973 HAWTHRN5 161	58011 CHOUTEU5 161	1	LN	293.0	209.0	312.3	106.6	195.0		
			57973 HAWTHRN5 161	58027 RANDLPH5 161	1	LN	293.0	244.0	300.1	102.4	201.0		
57973 HAWTHRN5 161	58011 CHOUTEU5 161	1	57973 HAWTHRN5 161	57976 LEVEE 5 161	1	LN	293.0	217.0	319.4	109.0	166.0		
			57973 HAWTHRN5 161	58027 RANDLPH5 161	1	LN	293.0	244.0	296.1	101.1	201.0		
			57976 LEVEE 5 161	57985 NEAST 5 161	1	LN	293.0	217.0	319.6	109.1	202.0		
57973 HAWTHRN5 161	58027 RANDLPH5 161	1	57973 HAWTHRN5 161	57976 LEVEE 5 161	1	LN	293.0	217.0	305.3	104.2	166.0		
			57976 LEVEE 5 161	57985 NEAST 5 161	1	LN	293.0	217.0	305.5	104.3	202.0		
57976 LEVEE 5 161	57985 NEAST 5 161	1	57973 HAWTHRN5 161	58011 CHOUTEU5 161	1	LN	293.0	209.0	312.4	106.6	195.0		
			57973 HAWTHRN5 161	58027 RANDLPH5 161	1	LN	293.0	244.0	300.1	102.4	201.0		
57977 CRAIG 7 345	57978 CRAIG 5 161	11	57968 STILWEL7 345	57981 LACYGNE7 345	1	LN	1099.0	1073.0	1118.5	101.8	998.0		
57977 CRAIG 7 345	57978 CRAIG 5 161	22	57968 STILWEL7 345	57981 LACYGNE7 345	1	LN	1099.0	1073.0	1118.1	101.7	998.0		
57977 CRAIG 7 345	57978 CRAIG 5 161	33	57968 STILWEL7 345	57981 LACYGNE7 345	1	LN	1099.0	1073.0	1109.8	101.0	998.0		

57978 CRAIG 5 161	57979 PFLUMM 5 161	1	57968 STILWEL7 345	57981 LACYGNE7 345	1	LN	1099.0	1073.0	1106.9	100.7	998.0		
			57978 CRAIG 5 161	58039 LENEXAN5 161	1	LN	293.0	241.0	311.9	106.5	214.0		
			58031 GRNWOOD5 161	58039 LENEXAN5 161	1	LN	293.0	223.0	295.2	100.7	196.0		
57978 CRAIG 5 161	58049 CEDRCRK5 161	1	57978 CRAIG 5 161	58039 LENEXAN5 161	1	LN	293.0	241.0	305.1	104.1	214.0		
57979 PFLUMM 5 161	58047 OVERLPK5 161	1	57968 STILWEL7 345	57981 LACYGNE7 345	1	LN	1099.0	1073.0	1105.5	100.6	998.0		
			57978 CRAIG 5 161	58039 LENEXAN5 161	1	LN	293.0	241.0	306.0	104.4	214.0		
57981 LACYGNE7 345	58105 PROP#2 345	1	57968 STILWEL7 345	57981 LACYGNE7 345	1	LN	1099.0	1073.0	1388.7	126.4	998.0	1254.7	114.2
69702 ST JOE 3 345	57982 IATAN 7 345	1	57968 STILWEL7 345	57981 LACYGNE7 345	1	LN	1099.0	1073.0	1135.7	103.3	998.0		
57985 NEAST 5 161	58011 CHOUTEU5 161	1	57973 HAWTHRN5 161	57976 LEVEE 5 161	1	LN	293.0	217.0	308.5	105.3	166.0		
			57976 LEVEE 5 161	57985 NEAST 5 161	1	LN	293.0	217.0	308.7	105.4	202.0		
57993 STHTOWN5 161	57994 HICKMAN5 161	1	57969 STILWEL5 161	58053 REDEL 5 161	1	LN	293.0	270.0	311.2	106.2	250.0		
			59239 HSNVL 5 161	59295 HSNVL 269.0	1	TR	50.0	50.0	50.4	100.8	49.0		
57993 STHTOWN5 161	58001 FOREST 5 161	1	58032 MERRIAM5 161	58040 ROEPARK5 161	1	LN	187.0	79.0	190.5	101.9	74.0		
57995 MONTROS5 161	58013 HARSNVL5 161	1	59239 HSNVL 5 161	59295 HSNVL 269.0	1	TR	50.0	50.0	50.3	100.6	49.0		
57995 MONTROS5 161	58013 HARSNVL5 161	2	59239 HSNVL 5 161	59295 HSNVL 269.0	1	TR	50.0	50.0	50.3	100.6	49.0		
57998 LVISTAE5 161	58013 HARSNVL5 161	1	59239 HSNVL 5 161	59295 HSNVL 269.0	1	TR	50.0	50.0	50.3	100.6	49.0		
57999 LVISTAW5 161	58008 BUNKRDG5 161	1	59239 HSNVL 5 161	59295 HSNVL 269.0	1	TR	50.0	50.0	50.2	100.5	49.0		
57999 LVISTAW5 161	58013 HARSNVL5 161	1	59239 HSNVL 5 161	59295 HSNVL 269.0	1	TR	50.0	50.0	50.3	100.6	49.0		
58002 MARTCIT5 161	58053 REDEL 5 161	1	59239 HSNVL 5 161	59295 HSNVL 269.0	1	TR	50.0	50.0	52.2	104.3	49.0	51.5	103.0
58002 MARTCIT5 161	59210 MARTCTY5 161	1	59239 HSNVL 5 161	59295 HSNVL 269.0	1	TR	50.0	50.0	51.7	103.5	49.0	51.1	102.1
58015 AVONDAL5 161	58027 RANDLPH5 161	1	57973 HAWTHRN5 161	57976 LEVEE 5 161	1	LN	293.0	217.0	297.4	101.5	166.0		
			57976 LEVEE 5 161	57985 NEAST 5 161	1	LN	293.0	217.0	297.5	101.5	202.0		
58031 GRNWOOD5 161	58049 CEDRCRK5 161	1	57978 CRAIG 5 161	58039 LENEXAN5 161	1	LN	293.0	241.0	297.9	101.7	214.0		
58036 OLATHEE5 161	58046 OXFORD 5 161	1	57969 STILWEL5 161	58053 REDEL 5 161	1	LN	293.0	270.0	295.8	101.0	250.0		
			59239 HSNVL 5 161	59295 HSNVL 269.0	1	TR	50.0	50.0	50.4	100.7	49.0		
58037 OLATHEW5 161	58043 MURLEN 5 161	1	57968 STILWEL7 345	57981 LACYGNE7 345	1	LN	1099.0	1073.0	1112.3	101.2	998.0		
58043 MURLEN 5 161	58044 MOONLT 5 161	1	57968 STILWEL7 345	57981 LACYGNE7 345	1	LN	1099.0	1073.0	1122.8	102.2	998.0		
58046 OXFORD 5 161	58050 ANTIOCH5 161	1	57969 STILWEL5 161	58053 REDEL 5 161	1	LN	293.0	270.0	309.0	105.4	250.0		
			59239 HSNVL 5 161	59295 HSNVL 269.0	1	TR	50.0	50.0	50.5	101.1	49.0		

58057	BUCYRUS5	161	58068	WAGSTAF5	161	1	57968	STILWEL7	345	57981	LACYGNE7	345	1	LN	1099.0	1073.0	1148.5	104.5	998.0		
							58066	S.OTTWA5	161	58077	SRICHLN5	161	1	LN	174.0	65.0	189.9	109.1	57.0		
58062	SALSBRY5	161	58064	NORTON-5	161	1	59217	WINDSR	5 161	96071	5CLINTN	161	1	LN	123.0	95.0	126.2	102.6	100.0	129.1	104.9
							59239	HSNVL	5 161	59295	HSNVL	269.0	1	TR	50.0	50.0	50.4	100.8	49.0		
58066	S.OTTWA5	161	58069	PAOLA	5 161	1	57969	STILWEL5	161	58057	BUCYRUS5	161	1	LN	224.0	178.0	258.8	115.5	164.0	236.4	105.5
58067	CENTENL5	161	58068	WAGSTAF5	161	1	57968	STILWEL7	345	57981	LACYGNE7	345	1	LN	1099.0	1073.0	1150.5	104.7	998.0		
							58066	S.OTTWA5	161	58077	SRICHLN5	161	1	LN	174.0	65.0	193.9	111.4	57.0	174.9	100.5
58067	CENTENL5	161	58069	PAOLA	5 161	1	57968	STILWEL7	345	57981	LACYGNE7	345	1	LN	1099.0	1073.0	1159.4	105.5	998.0		
							58066	S.OTTWA5	161	58077	SRICHLN5	161	1	LN	174.0	65.0	211.4	121.5	57.0	192.2	110.5
59200	PHILL	7 345	59225	PHILL	5 161	1	59239	HSNVL	5 161	59295	HSNVL	269.0	1	TR	50.0	50.0	50.6	101.1	49.0		
59202	SIBLEY	5 161	59235	DUNCAN	5 161	1	59239	HSNVL	5 161	59295	HSNVL	269.0	1	TR	50.0	50.0	50.3	100.6	49.0		
59202	SIBLEY	5 161	59244	ORRICK	5 161	1	59239	HSNVL	5 161	59295	HSNVL	269.0	1	TR	50.0	50.0	50.4	100.8	49.0		
59205	BLSPE	5 161	59227	OAKGRV	5 161	1	59239	HSNVL	5 161	59295	HSNVL	269.0	1	TR	50.0	50.0	50.4	100.7	49.0		
59206	PRALEE	5 161	59233	LEESUM	5 161	1	59239	HSNVL	5 161	59295	HSNVL	269.0	1	TR	50.0	50.0	50.4	100.8	49.0		
59207	ARCHIE	5 161	59240	ADRIAN	5 161	1	59239	HSNVL	5 161	59295	HSNVL	269.0	1	TR	50.0	50.0	53.4	106.8	49.0	53.4	106.8
59208	NEVADA	5 161	59216	BUTLER_5	161	1	59239	HSNVL	5 161	59295	HSNVL	269.0	1	TR	50.0	50.0	51.3	102.6	49.0	51.1	102.3
59209	SEDALIA5	161	59217	WINDSR	5 161	1	59239	HSNVL	5 161	59295	HSNVL	269.0	1	TR	50.0	50.0	50.9	101.9	49.0	50.5	101.0
59216	BUTLER_5	161	59240	ADRIAN	5 161	1	59239	HSNVL	5 161	59295	HSNVL	269.0	1	TR	50.0	50.0	52.8	105.5	49.0	52.8	105.5
59218	GRNWD	5 161	59233	LEESUM	5 161	1	59239	HSNVL	5 161	59295	HSNVL	269.0	1	TR	50.0	50.0	50.6	101.1	49.0		
59224	LNGVW	5 161	59249	HOOKRD	5 161	1	57969	STILWEL5	161	58053	REDEL	5 161	1	LN	293.0	270.0	321.2	109.6	250.0	298.0	101.7
							59239	HSNVL	5 161	59295	HSNVL	269.0	1	TR	50.0	50.0	51.9	103.9	49.0	51.3	102.6
59225	PHILL	5 161	59243	LKWINGB5	161	1	57969	STILWEL5	161	58053	REDEL	5 161	1	LN	293.0	270.0	328.3	112.0	250.0	305.1	104.1
							59239	HSNVL	5 161	59295	HSNVL	269.0	1	TR	50.0	50.0	52.3	104.5	49.0	51.6	103.2
59227	OAKGRV	5 161	59229	ODESSA	5 161	1	59239	HSNVL	5 161	59295	HSNVL	269.0	1	TR	50.0	50.0	50.2	100.5	49.0		
59228	WBURGE	5 161	59229	ODESSA	5 161	1	59239	HSNVL	5 161	59295	HSNVL	269.0	1	TR	50.0	50.0	50.4	100.9	49.0		
59236	RICHMND5	161	59244	ORRICK	5 161	1	59239	HSNVL	5 161	59295	HSNVL	269.0	1	TR	50.0	50.0	50.3	100.7	49.0		
59243	LKWINGB5	161	59249	HOOKRD	5 161	1	57969	STILWEL5	161	58053	REDEL	5 161	1	LN	293.0	270.0	323.9	110.6	250.0	300.7	102.6
							59239	HSNVL	5 161	59295	HSNVL	269.0	1	TR	50.0	50.0	52.1	104.1	49.0	51.4	102.9
96045	7MORGAN	345	56793	NEOSHO	7 345	1	57968	STILWEL7	345	57981	LACYGNE7	345	1	LN	1099.0	1073.0	1144.9	104.2	998.0		

96071	5CLINTN	161	57995	MONTROS5	161	1	59239	HSNVL	5 161	59295	HSNVL	269.0 1	TR	50.0	50.0	53.0	105.9	49.0	52.8	105.7
96071	5CLINTN	161	59217	WINDSR 5	161	1	59239	HSNVL	5 161	59295	HSNVL	269.0 1	TR	50.0	50.0	51.0	102.1	49.0	50.6	101.2
96071	5CLINTN	161	59242	CLINTON5	161	1	59228	WBURGE	5 161	59269	WBURGE	269.0 1	TR	50.0	44.0	69.6	139.2	44.0	69.6	139.2
							59239	HSNVL	5 161	59295	HSNVL	269.0 1	TR	50.0	50.0	51.8	103.6	49.0	51.3	102.6
96689	2BUTLER	69.0	59216	BUTLER_5	161	1	59239	HSNVL	5 161	59295	HSNVL	269.0 1	TR	50.0	50.0	50.6	101.2	49.0		
56651	JEC U1	26.0	56852	JEC	6	230 1	57968	STILWEL7	345	57981	LACYGNE7	345 1	LN	1099.0	1073.0	1138.1	103.6	998.0		
56652	JEC U2	26.0	56766	JEC N	7	345 1	57968	STILWEL7	345	57981	LACYGNE7	345 1	LN	1099.0	1073.0	1134.4	103.2	998.0		
56653	JEC U3	26.0	56766	JEC N	7	345 1	57968	STILWEL7	345	57981	LACYGNE7	345 1	LN	1099.0	1073.0	1134.4	103.2	998.0		
56663	LEC U5	24.0	56854	LEC U5	6	230 1	57968	STILWEL7	345	57981	LACYGNE7	345 1	LN	1099.0	1073.0	1124.4	102.3	998.0		
56772	STRANGR7	345	56811	STRANG7X	1.00	1	58042	SPRGHL	5 161	57267	SPRINGH3	115 1	TR	100.0	87.0	100.9	100.9	83.0		
							57968	STILWEL7	345	57981	LACYGNE7	345 1	LN	1099.0	1073.0	1105.3	100.6	998.0		
56853	LAWHILL6	230	57250	LWRNCHL3	115	1	56855	MIDLAND6	230	57252	MIDLAND3	115 1	TR	280.0	172.0	319.2	114.0	166.0	308.2	110.1
56855	MIDLAND6	230	57252	MIDLAND3	115	1	56853	LAWHILL6	230	57250	LWRNCHL3	115 1	TR	280.0	237.0	356.5	127.3	230.0	344.7	123.1
57951	HAW G5	122.0	57973	HAWTHRN5	161	1	57995	MONTROS5	161	57954	MONTG3	118.0 1	TR	175.0	168.0	176.2	100.7	153.0		
							57968	STILWEL7	345	57981	LACYGNE7	345 1	LN	1099.0	1073.0	1160.7	105.6	998.0		
57952	MONTG1	122.0	57995	MONTROS5	161	1	57995	MONTROS5	161	57954	MONTG3	118.0 1	TR	175.0	168.0	179.0	102.3	153.0		
							57968	STILWEL7	345	57981	LACYGNE7	345 1	LN	1099.0	1073.0	1112.5	101.2	998.0		
57953	MONTG2	122.0	57995	MONTROS5	161	1	57995	MONTROS5	161	57954	MONTG3	118.0 1	TR	175.0	168.0	178.9	102.3	153.0		
							57968	STILWEL7	345	57981	LACYGNE7	345 1	LN	1099.0	1073.0	1111.8	101.2	998.0		
57954	MONTG3	118.0	57995	MONTROS5	161	1	57968	STILWEL7	345	57981	LACYGNE7	345 1	LN	1099.0	1073.0	1111.6	101.1	998.0		
57957	IAT G1	124.0	57982	IATAN	7	345 1	57968	STILWEL7	345	57981	LACYGNE7	345 1	LN	1099.0	1073.0	1128.7	102.7	998.0		
59151	SIBLEY#	322.0	59202	SIBLEY	5	161 1	57968	STILWEL7	345	57981	LACYGNE7	345 1	LN	1099.0	1073.0	1141.5	103.9	998.0		
							59239	HSNVL	5 161	59295	HSNVL	269.0 1	TR	50.0	50.0	50.4	100.9	49.0		
59162	ARIESSTG	18.0	59225	PHILL	5	161 1	57968	STILWEL7	345	57981	LACYGNE7	345 1	LN	1099.0	1073.0	1124.3	102.3	998.0		
59163	ARIESCT1	18.0	59225	PHILL	5	161 1	57968	STILWEL7	345	57981	LACYGNE7	345 1	LN	1099.0	1073.0	1115.8	101.5	998.0		
59164	ARIESCT2	18.0	59225	PHILL	5	161 1	57968	STILWEL7	345	57981	LACYGNE7	345 1	LN	1099.0	1073.0	1115.8	101.5	998.0		
59208	NEVADA 5	161	59308	NEVADA	269.0	1	59208	NEVADA 5	161	59308	NEVADA	269.0 2	TR	50.0	26.0	50.4	100.9	26.0		
59208	NEVADA 5	161	59308	NEVADA	269.0	2	59208	NEVADA 5	161	59308	NEVADA	269.0 1	TR	50.0	30.0	51.8	103.6	30.0	51.0	101.9
59209	SEDALIA5	161	59271	SEDN	269.0	1	59209	SEDALIA5	161	59272	SEDS	269.0 1	TR	50.0	29.0	51.9	103.8	28.0	50.6	101.3

	59228 WBURGE 5 161	59269 WBURGE 269.0	1	TR	50.0	44.0	52.4	104.8	44.0	52.5	105.0
	59239 HSNVL 5 161	59295 HSNVL 269.0	1	TR	50.0	50.0	50.3	100.5	49.0		
59209 SEDALIA5 161	59272 SEDS 269.0	1	59209 SEDALIA5 161	59271 SEDN 269.0	1	TR	50.0	35.0	55.6	111.2	35.0	54.4	108.8
			59228 WBURGE 5 161	59269 WBURGE 269.0	1	TR	50.0	44.0	50.9	101.8	44.0	51.0	102.0
59210 MARTCTY5 161	59287 MARTCTY269.0	1	59239 HSNVL 5 161	59295 HSNVL 269.0	1	TR	50.0	50.0	55.4	110.8	49.0	55.0	110.1
59224 LNGVW 5 161	59282 LNGVW 269.0	1	59210 MARTCTY5 161	59287 MARTCTY269.0	1	TR	50.0	38.0	57.8	115.6	39.0	59.2	118.4
			59239 HSNVL 5 161	59295 HSNVL 269.0	1	TR	50.0	50.0	56.1	112.2	49.0	55.7	111.3
59225 PHILL 5 161	59280 PHILL 269.0	1	59228 WBURGE 5 161	59269 WBURGE 269.0	1	TR	50.0	44.0	52.8	105.5	44.0	53.2	106.3
			59239 HSNVL 5 161	59295 HSNVL 269.0	1	TR	50.0	50.0	72.4	144.8	49.0	72.1	144.3
			59210 MARTCTY5 161	59287 MARTCTY269.0	1	TR	50.0	38.0			39.0	51.0	102.0
59228 WBURGE 5 161	59269 WBURGE 269.0	1	59239 HSNVL 5 161	59295 HSNVL 269.0	1	TR	50.0	50.0	51.5	103.1	49.0	51.0	102.1
59232 LEX161 5 161	59264 LEX69 269.0	1	59239 HSNVL 5 161	59295 HSNVL 269.0	1	TR	50.0	50.0	50.3	100.6	49.0		
			59228 WBURGE 5 161	59269 WBURGE 269.0	1	TR	50.0	44.0			44.0	50.5	101.0
59242 CLINTON5 161	59303 CLINTON269.0	1	59239 HSNVL 5 161	59295 HSNVL 269.0	1	TR	50.0	50.0	50.3	100.7	49.0		
			59242 CLINTON5 161	59303 CLINTON269.0	2	TR	50.0	36.0	56.2	112.4	35.0	55.5	111.0
59242 CLINTON5 161	59303 CLINTON269.0	2	59239 HSNVL 5 161	59295 HSNVL 269.0	1	TR	50.0	50.0	50.3	100.6	49.0		
			59242 CLINTON5 161	59303 CLINTON269.0	1	TR	50.0	35.0	56.5	113.0	35.0	55.8	111.6

Branch Violations

Table C-3 Base case vs Customer 1100MW w/o system improvements

*** MUST 4.00 *** FRI, APR 06 2001 12:33 ***
1-2001 SOUTHWEST POWER POOL POWER FLOW MODEL
2004 SUMMER PEAK (04SP) BASE CASE;WITH MODS (SEE LONG TITLE)

start: 3:06:09 PM
end: 3:38:00 PM
elapsed: 0:31:51

Notes:
Base case vs Customer study with 1100MW generation

*****Comparison of Base case flows to Contingency flows*****

Contingency	Monitored Element		Rating	Base Case			Study Case		
				Normal	Contingency Flow	Contingency % of Rating	Normal	Contingency Flow	Contingency % of Rating
56765 HOYT 7 345 56766 JEC N 7 345 1	57965 W.GRDNR7 345 58105 PROP#2 345 1	LN	1099.0	965.0	1104.5	100.5	808.0		
56769 LANG 7 345 56774 SWISVAL7 345 1	57968 STILWEL7 345 57981 LACYGNE7 345 1	LN	1099.0	1073.0	1111.6	101.1	998.0		
56769 LANG 7 345 56796 WICHITA7 345 1	57968 STILWEL7 345 57981 LACYGNE7 345 1	LN	1099.0	1073.0	1118.1	101.7	998.0		
56774 SWISVAL7 345 57968 STILWEL7 345 1	57968 STILWEL7 345 57981 LACYGNE7 345 1	LN	1099.0	1073.0	1110.0	101.0	998.0		
56791 BENTON 7 345 56797 WOLFCRK7 345 1	57968 STILWEL7 345 57981 LACYGNE7 345 1	LN	1099.0	1073.0	1164.0	105.9	998.0		
56793 NEOSHO 7 345 57981 LACYGNE7 345 1	57968 STILWEL7 345 57981 LACYGNE7 345 1	LN	1099.0	1073.0	1153.3	104.9	998.0	1143.1	104.0
56794 ROSEHIL7 345 56797 WOLFCRK7 345 1	57968 STILWEL7 345 57981 LACYGNE7 345 1	LN	1099.0	1073.0	1156.0	105.2	998.0		
56851 AUBURN 6 230 56852 JEC 6 230 1	57968 STILWEL7 345 57981 LACYGNE7 345 1	LN	1099.0	1073.0	1106.9	100.7	998.0		
56853 LAWHILL6 230 56854 LEC U5 6 230 1	57968 STILWEL7 345 57981 LACYGNE7 345 1	LN	1099.0	1073.0	1124.4	102.3	998.0		
56853 LAWHILL6 230 56855 MIDLAND6 230 1	56853 LAWHILL6 230 57250 LWRNCHL3 115 1	TR	280.0	237.0	356.5	127.3	227.0	341.3	121.9
57965 W.GRDNR7 345 57966 WGARDNR5 161 11	57968 STILWEL7 345 57981 LACYGNE7 345 1	LN	1099.0	1073.0	1133.1	103.1	998.0		
57965 W.GRDNR7 345 57977 CRAIG 7 345 1	58042 SPRGHL 5 161 57267 SPRINGH3 115 1	TR	100.0	87.0	100.6	100.6	77.0		
	57965 W.GRDNR7 345 57966 WGARDNR5 161 11	TR	400.0	200.0	479.9	120.0	216.0	432.5	108.1
	57966 WGARDNR5 161 58044 MOONLT 5 161 1	LN	293.0	220.0	435.4	148.6	216.0	380.0	129.7
	57968 STILWEL7 345 57981 LACYGNE7 345 1	LN	1099.0	1073.0	1440.3	131.1	998.0	1277.6	116.3
	57969 STILWEL5 161 58053 REDEL 5 161 1	LN	293.0	270.0	312.2	106.5	258.0		
	57969 STILWEL5 161 58057 BUCYRUS5 161 1	LN	224.0	178.0	226.5	101.1	161.0		
	58037 OLATHEW5 161 58043 MURLEN 5 161 1	LN	293.0	122.0	339.2	115.8	118.0		
	58043 MURLEN 5 161 58044 MOONLT 5 161 1	LN	293.0	179.0	397.1	135.5	175.0	341.5	116.6
57965 W.GRDNR7 345 58105 PROP#2 345 1	58042 SPRGHL 5 161 57267 SPRINGH3 115 1	TR	100.0	87.0	101.1	101.1	77.0		
	57995 MONTROS5 161 57954 MONTG3 118.0 1	TR	175.0	168.0	177.0	101.2	158.0		
	57968 STILWEL7 345 57981 LACYGNE7 345 1	LN	1099.0	1073.0	1767.0	160.8	998.0	1567.5	142.6

	57969 STILWEL5 161 58053 REDEL 5 161 1	LN	293.0	270.0	314.2	107.2	258.0		
	57993 STHTOWN5 161 59210 MARTCTY5 161 1	LN	224.0	163.0	245.3	109.5	130.0		
	58036 OLATHEE5 161 58046 OXFORD 5 161 1	LN	293.0	156.0	354.4	121.0	107.0		
57966 WGARDNR5 161 58044 MOONLT 5 161 1	57968 STILWEL7 345 57981 LACYGNE7 345 1	LN	1099.0	1073.0	1129.7	102.8	998.0		
57968 STILWEL7 345 57969 STILWEL5 161 22	57968 STILWEL7 345 57969 STILWEL5 161 11	TR	550.0	366.0	559.4	101.7	347.0		
57968 STILWEL7 345 57981 LACYGNE7 345 1	57995 MONTROS5 161 57954 MONTG3 118.0 1	TR	175.0	168.0	176.1	100.6	158.0		
	57965 W.GRDNR7 345 57977 CRAIG 7 345 1	LN	1099.0	771.0	1297.8	118.1	595.0		
	57965 W.GRDNR7 345 58105 PROP#2 345 1	LN	1099.0	965.0	1628.7	148.2	808.0	1411.2	128.4
	57966 WGARDNR5 161 58044 MOONLT 5 161 1	LN	293.0	220.0	304.7	104.0	216.0		
	57969 STILWEL5 161 58057 BUCYRUS5 161 1	LN	224.0	178.0	260.5	116.3	161.0	235.6	105.2
	57978 CRAIG 5 161 58039 LENEXAN5 161 1	LN	293.0	241.0	308.9	105.4	256.0	317.9	108.5
	58067 CENTENL5 161 58068 WAGSTAF5 161 1	LN	293.0	210.0	296.1	101.1	192.0		
	58031 GRNWOOD5 161 58039 LENEXAN5 161 1	LN	293.0	223.0			238.0	301.4	102.9
57968 STILWEL7 345 59200 PHILL 7 345 1	57969 STILWEL5 161 58053 REDEL 5 161 1	LN	293.0	270.0	350.1	119.5	258.0	336.8	115.0
	58002 MARTCIT5 161 58053 REDEL 5 161 1	LN	293.0	232.0	315.8	107.8	220.0	302.5	103.2
	59239 HSNVL 5 161 59295 HSNVL 269.0 1	TR	50.0	50.0	51.3	102.7	49.0	50.8	101.6
57969 STILWEL5 161 57994 HICKMAN5 161 1	57969 STILWEL5 161 58053 REDEL 5 161 1	LN	293.0	270.0	328.2	112.0	258.0	310.2	105.9
	57993 STHTOWN5 161 59210 MARTCTY5 161 1	LN	224.0	163.0	234.8	104.8	130.0		
	59239 HSNVL 5 161 59295 HSNVL 269.0 1	TR	50.0	50.0	50.6	101.1	49.0		
57969 STILWEL5 161 58050 ANTIOCH5 161 1	57969 STILWEL5 161 58053 REDEL 5 161 1	LN	293.0	270.0	314.9	107.5	258.0		
	59239 HSNVL 5 161 59295 HSNVL 269.0 1	TR	50.0	50.0	50.6	101.2	49.0		
57969 STILWEL5 161 58053 REDEL 5 161 1	59239 HSNVL 5 161 59295 HSNVL 269.0 1	TR	50.0	50.0	52.5	105.1	49.0	51.9	103.8
57969 STILWEL5 161 58057 BUCYRUS5 161 1	57968 STILWEL7 345 57981 LACYGNE7 345 1	LN	1099.0	1073.0	1139.1	103.7	998.0		
69702 ST JOE 3 345 57972 HAWTH 7 345 1	57968 STILWEL7 345 57981 LACYGNE7 345 1	LN	1099.0	1073.0	1106.9	100.7	998.0		
57973 HAWTHRN5 161 57976 LEVEE 5 161 1	57973 HAWTHRN5 161 58011 CHOUTEU5 161 1	LN	293.0	209.0	312.3	106.6	199.0		
	57973 HAWTHRN5 161 58027 RANDLPH5 161 1	LN	293.0	244.0	300.1	102.4	232.0		
57973 HAWTHRN5 161 58011 CHOUTEU5 161 1	57973 HAWTHRN5 161 57976 LEVEE 5 161 1	LN	293.0	217.0	319.4	109.0	128.0		
	57973 HAWTHRN5 161 58027 RANDLPH5 161 1	LN	293.0	244.0	296.1	101.1	232.0		
	57976 LEVEE 5 161 57985 NEAST 5 161 1	LN	293.0	217.0	319.6	109.1	207.0	303.5	103.6
57973 HAWTHRN5 161 58027 RANDLPH5 161 1	57973 HAWTHRN5 161 57976 LEVEE 5 161 1	LN	293.0	217.0	305.3	104.2	128.0		
	57976 LEVEE 5 161 57985 NEAST 5 161 1	LN	293.0	217.0	305.5	104.3	207.0		
57976 LEVEE 5 161 57985 NEAST 5 161 1	57973 HAWTHRN5 161 58011 CHOUTEU5 161 1	LN	293.0	209.0	312.4	106.6	199.0	296.3	101.1
	57973 HAWTHRN5 161 58027 RANDLPH5 161 1	LN	293.0	244.0	300.1	102.4	232.0		
57977 CRAIG 7 345 57978 CRAIG 5 161 11	57968 STILWEL7 345 57981 LACYGNE7 345 1	LN	1099.0	1073.0	1118.5	101.8	998.0		
	57977 CRAIG 7 345 57978 CRAIG 5 161 22	TR	550.0	362.0			404.0	566.8	103.0
	57977 CRAIG 7 345 57978 CRAIG 5 161 33	TR	400.0	275.0			307.0	430.4	107.6

57977 CRAIG 7 345	57978 CRAIG 5 161	22	57968 STILWEL7 345	57981 LACYGNE7 345	1	LN	1099.0	1073.0	1118.1	101.7	998.0									
			57977 CRAIG 7 345	57978 CRAIG 5 161	11	TR	550.0	365.0			408.0	569.9	103.6							
			57977 CRAIG 7 345	57978 CRAIG 5 161	33	TR	400.0	275.0			307.0	428.9	107.2							
57977 CRAIG 7 345	57978 CRAIG 5 161	33	57968 STILWEL7 345	57981 LACYGNE7 345	1	LN	1099.0	1073.0	1109.8	101.0	998.0									
57978 CRAIG 5 161	57979 PFLUMM 5 161	1	57968 STILWEL7 345	57981 LACYGNE7 345	1	LN	1099.0	1073.0	1106.9	100.7	998.0									
			57978 CRAIG 5 161	58039 LENEXAN5 161	1	LN	293.0	241.0	311.9	106.5	256.0	332.4	113.4							
			58031 GRNWOOD5 161	58039 LENEXAN5 161	1	LN	293.0	223.0	295.2	100.7	238.0	315.6	107.7							
57978 CRAIG 5 161	58049 CEDRCRK5 161	1	57978 CRAIG 5 161	58039 LENEXAN5 161	1	LN	293.0	241.0	305.1	104.1	256.0	322.7	110.1							
			58031 GRNWOOD5 161	58039 LENEXAN5 161	1	LN	293.0	223.0			238.0	306.1	104.5							
57979 PFLUMM 5 161	58047 OVERLPK5 161	1	57968 STILWEL7 345	57981 LACYGNE7 345	1	LN	1099.0	1073.0	1105.5	100.6	998.0									
			57978 CRAIG 5 161	58039 LENEXAN5 161	1	LN	293.0	241.0	306.0	104.4	256.0	326.5	111.4							
			58031 GRNWOOD5 161	58039 LENEXAN5 161	1	LN	293.0	223.0			238.0	309.8	105.7							
57981 LACYGNE7 345	58105 PROP#2 345	1	57968 STILWEL7 345	57981 LACYGNE7 345	1	LN	1099.0	1073.0	1388.7	126.4	998.0	1196.6	108.9							
69702 ST JOE 3 345	57982 IATAN 7 345	1	57968 STILWEL7 345	57981 LACYGNE7 345	1	LN	1099.0	1073.0	1135.7	103.3	998.0									
			56772 STRANGR7 345	57982 IATAN 7 345	1	LN	1099.0	236.0			718.0	1732.6	157.4							
			57978 CRAIG 5 161	58039 LENEXAN5 161	1	LN	293.0	241.0			256.0	350.2	119.5							
			58031 GRNWOOD5 161	58039 LENEXAN5 161	1	LN	293.0	223.0			238.0	333.5	113.8							
			58032 MERRIAM5 161	58040 ROEPARK5 161	1	LN	187.0	79.0			106.0	194.2	103.9							
57985 NEAST 5 161	58011 CHOUTEU5 161	1	57973 HAWTHRN5 161	57976 LEVEE 5 161	1	LN	293.0	217.0	308.5	105.3	128.0									
			57976 LEVEE 5 161	57985 NEAST 5 161	1	LN	293.0	217.0	308.7	105.4	207.0									
57993 STHTOWN5 161	57994 HICKMAN5 161	1	57969 STILWEL5 161	58053 REDEL 5 161	1	LN	293.0	270.0	311.2	106.2	258.0									
			59239 HSNVL 5 161	59295 HSNVL 269.0	1	TR	50.0	50.0	50.4	100.8	49.0									
57993 STHTOWN5 161	58001 FOREST 5 161	1	58032 MERRIAM5 161	58040 ROEPARK5 161	1	LN	187.0	79.0	190.5	101.9	106.0	201.1	107.5							
57995 MONTROS5 161	58013 HARSNVL5 161	1	59239 HSNVL 5 161	59295 HSNVL 269.0	1	TR	50.0	50.0	50.3	100.6	49.0									
57995 MONTROS5 161	58013 HARSNVL5 161	2	59239 HSNVL 5 161	59295 HSNVL 269.0	1	TR	50.0	50.0	50.3	100.6	49.0									
57998 LVISTAE5 161	58013 HARSNVL5 161	1	59239 HSNVL 5 161	59295 HSNVL 269.0	1	TR	50.0	50.0	50.3	100.6	49.0									
57999 LVISTAW5 161	58008 BUNKRDG5 161	1	59239 HSNVL 5 161	59295 HSNVL 269.0	1	TR	50.0	50.0	50.2	100.5	49.0									
57999 LVISTAW5 161	58013 HARSNVL5 161	1	59239 HSNVL 5 161	59295 HSNVL 269.0	1	TR	50.0	50.0	50.3	100.6	49.0									
58002 MARTCIT5 161	58053 REDEL 5 161	1	59239 HSNVL 5 161	59295 HSNVL 269.0	1	TR	50.0	50.0	52.2	104.3	49.0	51.5	103.0							
58002 MARTCIT5 161	59210 MARTCTY5 161	1	59239 HSNVL 5 161	59295 HSNVL 269.0	1	TR	50.0	50.0	51.7	103.5	49.0	51.1	102.2							
58015 AVONDAL5 161	58027 RANDLPH5 161	1	57973 HAWTHRN5 161	57976 LEVEE 5 161	1	LN	293.0	217.0	297.4	101.5	128.0									
			57976 LEVEE 5 161	57985 NEAST 5 161	1	LN	293.0	217.0	297.5	101.5	207.0									
58031 GRNWOOD5 161	58049 CEDRCRK5 161	1	57978 CRAIG 5 161	58039 LENEXAN5 161	1	LN	293.0	241.0	297.9	101.7	256.0	315.5	107.7							

			58031 GRNWOOD5 161	58039 LENEXAN5 161	1	LN	293.0	223.0			238.0	298.9	102.0
58036 OLATHEE5 161 58046 OXFORD 5 161	1		57969 STILWEL5 161	58053 REDEL 5 161	1	LN	293.0	270.0	295.8	101.0	258.0		
			59239 HSNVL 5 161	59295 HSNVL 269.0	1	TR	50.0	50.0	50.4	100.7	49.0		
58037 OLATHEW5 161 58043 MURLEN 5 161	1		57968 STILWEL7 345	57981 LACYGNE7 345	1	LN	1099.0	1073.0	1112.3	101.2	998.0		
58043 MURLEN 5 161 58044 MOONLT 5 161	1		57968 STILWEL7 345	57981 LACYGNE7 345	1	LN	1099.0	1073.0	1122.8	102.2	998.0		
58046 OXFORD 5 161 58050 ANTIOCH5 161	1		57969 STILWEL5 161	58053 REDEL 5 161	1	LN	293.0	270.0	309.0	105.4	258.0		
			59239 HSNVL 5 161	59295 HSNVL 269.0	1	TR	50.0	50.0	50.5	101.1	49.0		
58057 BUCYRUS5 161 58068 WAGSTAF5 161	1		57968 STILWEL7 345	57981 LACYGNE7 345	1	LN	1099.0	1073.0	1148.5	104.5	998.0		
			58066 S.OTTWA5 161	58077 SRICHLN5 161	1	LN	174.0	65.0	189.9	109.1	46.0		
58062 SALSBRY5 161 58064 NORTON-5 161	1		59217 WINDSR 5 161	96071 5CLINTN 161	1	LN	123.0	95.0	126.2	102.6	105.0	133.2	108.3
			59239 HSNVL 5 161	59295 HSNVL 269.0	1	TR	50.0	50.0	50.4	100.8	49.0		
58066 S.OTTWA5 161 58069 PAOLA 5 161	1		57969 STILWEL5 161	58057 BUCYRUS5 161	1	LN	224.0	178.0	258.8	115.5	161.0	225.0	100.5
58067 CENTENL5 161 58068 WAGSTAF5 161	1		57968 STILWEL7 345	57981 LACYGNE7 345	1	LN	1099.0	1073.0	1150.5	104.7	998.0		
			58066 S.OTTWA5 161	58077 SRICHLN5 161	1	LN	174.0	65.0	193.9	111.4	46.0		
58067 CENTENL5 161 58069 PAOLA 5 161	1		57968 STILWEL7 345	57981 LACYGNE7 345	1	LN	1099.0	1073.0	1159.4	105.5	998.0		
			58066 S.OTTWA5 161	58077 SRICHLN5 161	1	LN	174.0	65.0	211.4	121.5	46.0	179.3	103.0
59200 PHILL 7 345 59225 PHILL 5 161	1		59239 HSNVL 5 161	59295 HSNVL 269.0	1	TR	50.0	50.0	50.6	101.1	49.0		
59202 SIBLEY 5 161 59235 DUNCAN 5 161	1		59239 HSNVL 5 161	59295 HSNVL 269.0	1	TR	50.0	50.0	50.3	100.6	49.0		
59202 SIBLEY 5 161 59244 ORRICK 5 161	1		59239 HSNVL 5 161	59295 HSNVL 269.0	1	TR	50.0	50.0	50.4	100.8	49.0		
59205 BLSPE 5 161 59227 OAKGRV 5 161	1		59239 HSNVL 5 161	59295 HSNVL 269.0	1	TR	50.0	50.0	50.4	100.7	49.0		
59206 PRALEE 5 161 59233 LEESUM 5 161	1		59239 HSNVL 5 161	59295 HSNVL 269.0	1	TR	50.0	50.0	50.4	100.8	49.0		
59207 ARCHIE 5 161 59240 ADRIAN 5 161	1		59239 HSNVL 5 161	59295 HSNVL 269.0	1	TR	50.0	50.0	53.4	106.8	49.0	53.6	107.2
			57995 MONTROS5 161	96071 5CLINTN 161	1	LN	370.0	279.0			337.0	372.1	100.6
59208 NEVADA 5 161 59216 BUTLER_5 161	1		59239 HSNVL 5 161	59295 HSNVL 269.0	1	TR	50.0	50.0	51.3	102.6	49.0	51.2	102.5
59209 SEDALIA5 161 59217 WINDSR 5 161	1		59239 HSNVL 5 161	59295 HSNVL 269.0	1	TR	50.0	50.0	50.9	101.9	49.0	50.5	101.0
59216 BUTLER_5 161 59240 ADRIAN 5 161	1		59239 HSNVL 5 161	59295 HSNVL 269.0	1	TR	50.0	50.0	52.8	105.5	49.0	52.9	105.9
59218 GRNWD 5 161 59233 LEESUM 5 161	1		59239 HSNVL 5 161	59295 HSNVL 269.0	1	TR	50.0	50.0	50.6	101.1	49.0		
59224 LNGVW 5 161 59249 HOOKRD 5 161	1		57969 STILWEL5 161	58053 REDEL 5 161	1	LN	293.0	270.0	321.2	109.6	258.0	306.6	104.6
			59239 HSNVL 5 161	59295 HSNVL 269.0	1	TR	50.0	50.0	51.9	103.9	49.0	51.3	102.6
59225 PHILL 5 161 59243 LKWINGB5 161	1		57969 STILWEL5 161	58053 REDEL 5 161	1	LN	293.0	270.0	328.3	112.0	258.0	313.7	107.1

	59239 HSNVL 5 161	59295 HSNVL 269.0	1	TR	50.0	50.0	52.3	104.5	49.0	51.6	103.2
59227 OAKGRV 5 161 59229 ODESSA 5 161	1	59239 HSNVL 5 161	59295 HSNVL 269.0	1	TR	50.0	50.0	50.2	100.5	49.0		
59228 WBURGE 5 161 59229 ODESSA 5 161	1	59239 HSNVL 5 161	59295 HSNVL 269.0	1	TR	50.0	50.0	50.4	100.9	49.0		
		59217 WINDSR 5 161	96071 5CLINTN 161	1	LN	123.0	95.0			105.0	129.6	105.4
59236 RICHMND5 161 59244 ORRICK 5 161	1	59239 HSNVL 5 161	59295 HSNVL 269.0	1	TR	50.0	50.0	50.3	100.7	49.0		
59243 LKWINGB5 161 59249 HOOKRD 5 161	1	57969 STILWEL5 161	58053 REDEL 5 161	1	LN	293.0	270.0	323.9	110.6	258.0	309.3	105.6
		59239 HSNVL 5 161	59295 HSNVL 269.0	1	TR	50.0	50.0	52.1	104.1	49.0	51.4	102.8
96045 7MORGAN 345 56793 NEOSHO 7 345	1	57968 STILWEL7 345	57981 LACYGNE7 345	1	LN	1099.0	1073.0	1144.9	104.2	998.0		
96071 5CLINTN 161 57995 MONTROS5 161	1	59239 HSNVL 5 161	59295 HSNVL 269.0	1	TR	50.0	50.0	53.0	105.9	49.0	53.0	106.1
96071 5CLINTN 161 59217 WINDSR 5 161	1	59239 HSNVL 5 161	59295 HSNVL 269.0	1	TR	50.0	50.0	51.0	102.1	49.0	50.6	101.2
96071 5CLINTN 161 59242 CLINTON5 161	1	59228 WBURGE 5 161	59269 WBURGE 269.0	1	TR	50.0	44.0	69.6	139.2	44.0	69.0	138.1
		59239 HSNVL 5 161	59295 HSNVL 269.0	1	TR	50.0	50.0	51.8	103.6	49.0	51.2	102.5
96689 2BUTLER 69.0 59216 BUTLER_5 161	1	59239 HSNVL 5 161	59295 HSNVL 269.0	1	TR	50.0	50.0	50.6	101.2	49.0		
56651 JEC U1 26.0 56852 JEC 6 230	1	57968 STILWEL7 345	57981 LACYGNE7 345	1	LN	1099.0	1073.0	1138.1	103.6	998.0		
56652 JEC U2 26.0 56766 JEC N 7 345	1	57968 STILWEL7 345	57981 LACYGNE7 345	1	LN	1099.0	1073.0	1134.4	103.2	998.0		
56653 JEC U3 26.0 56766 JEC N 7 345	1	57968 STILWEL7 345	57981 LACYGNE7 345	1	LN	1099.0	1073.0	1134.4	103.2	998.0		
56663 LEC U5 24.0 56854 LEC U5 6 230	1	57968 STILWEL7 345	57981 LACYGNE7 345	1	LN	1099.0	1073.0	1124.4	102.3	998.0		
56772 STRANGR7 345 56811 STRANG7X1.00	1	58042 SPRGHL 5 161	57267 SPRINGH3 115	1	TR	100.0	87.0	100.9	100.9	77.0		
		57968 STILWEL7 345	57981 LACYGNE7 345	1	LN	1099.0	1073.0	1105.3	100.6	998.0		
56853 LAWHILL6 230 57250 LWRNCHL3 115	1	56855 MIDLAND6 230	57252 MIDLAND3 115	1	TR	280.0	172.0	319.2	114.0	165.0	305.4	109.1
56855 MIDLAND6 230 57252 MIDLAND3 115	1	56853 LAWHILL6 230	57250 LWRNCHL3 115	1	TR	280.0	237.0	356.5	127.3	227.0	341.4	121.9
57951 HAW G5 122.0 57973 HAWTHRN5 161	1	57995 MONTROS5 161	57954 MONTG3 118.0	1	TR	175.0	168.0	176.2	100.7	158.0		
		57968 STILWEL7 345	57981 LACYGNE7 345	1	LN	1099.0	1073.0	1160.7	105.6	998.0		
57952 MONTG1 122.0 57995 MONTROS5 161	1	57995 MONTROS5 161	57954 MONTG3 118.0	1	TR	175.0	168.0	179.0	102.3	158.0		
		57968 STILWEL7 345	57981 LACYGNE7 345	1	LN	1099.0	1073.0	1112.5	101.2	998.0		
57953 MONTG2 122.0 57995 MONTROS5 161	1	57995 MONTROS5 161	57954 MONTG3 118.0	1	TR	175.0	168.0	178.9	102.3	158.0		
		57968 STILWEL7 345	57981 LACYGNE7 345	1	LN	1099.0	1073.0	1111.8	101.2	998.0		
57954 MONTG3 118.0 57995 MONTROS5 161	1	57968 STILWEL7 345	57981 LACYGNE7 345	1	LN	1099.0	1073.0	1111.6	101.1	998.0		
57957 IAT G1 124.0 57982 IATAN 7 345	1	57968 STILWEL7 345	57981 LACYGNE7 345	1	LN	1099.0	1073.0	1128.7	102.7	998.0		

59151 SIBLEY#322.0	59202 SIBLEY 5	161	1	57968 STILWEL7	345	57981 LACYGNE7	345	1	LN	1099.0	1073.0	1141.5	103.9	998.0						
				59239 HSNVL	5	161	59295 HSNVL	269.0	1	TR	50.0	50.0	50.4	100.9	49.0					
59162 ARIESSTG18.0	59225 PHILL	5	161 1	57968 STILWEL7	345	57981 LACYGNE7	345	1	LN	1099.0	1073.0	1124.3	102.3	998.0						
59163 ARIESCT118.0	59225 PHILL	5	161 1	57968 STILWEL7	345	57981 LACYGNE7	345	1	LN	1099.0	1073.0	1115.8	101.5	998.0						
59164 ARIESCT218.0	59225 PHILL	5	161 1	57968 STILWEL7	345	57981 LACYGNE7	345	1	LN	1099.0	1073.0	1115.8	101.5	998.0						
59208 NEVADA 5	161 59308 NEVADA	269.0	1	59208 NEVADA 5	161	59308 NEVADA	269.0	2	TR	50.0	26.0	50.4	100.9	26.0						
59208 NEVADA 5	161 59308 NEVADA	269.0	2	59208 NEVADA 5	161	59308 NEVADA	269.0	1	TR	50.0	30.0	51.8	103.6	29.0	50.8	101.6				
59209 SEDALIA5	161 59271 SEDN	269.0	1	59209 SEDALIA5	161	59272 SEDS	269.0	1	TR	50.0	29.0	51.9	103.8	27.0	50.2	100.5				
				59228 WBURGE 5	161	59269 WBURGE	269.0	1	TR	50.0	44.0	52.4	104.8	44.0	51.8	103.6				
				59239 HSNVL	5	161	59295 HSNVL	269.0	1	TR	50.0	50.0	50.3	100.5	49.0					
59209 SEDALIA5	161 59272 SEDS	269.0	1	59209 SEDALIA5	161	59271 SEDN	269.0	1	TR	50.0	35.0	55.6	111.2	34.0	54.0	108.1				
				59228 WBURGE 5	161	59269 WBURGE	269.0	1	TR	50.0	44.0	50.9	101.8	44.0	50.3	100.7				
59210 MARTCTY5	161 59287 MARTCTY	269.0	1	59239 HSNVL	5	161	59295 HSNVL	269.0	1	TR	50.0	50.0	55.4	110.8	49.0	55.1	110.1			
59224 LNGVW	5 161 59282 LNGVW	269.0	1	59210 MARTCTY5	161	59287 MARTCTY	269.0	1	TR	50.0	38.0	57.8	115.6	39.0	59.7	119.5				
				59239 HSNVL	5	161	59295 HSNVL	269.0	1	TR	50.0	50.0	56.1	112.2	49.0	55.6	111.1			
59225 PHILL	5 161 59280 PHILL	269.0	1	59228 WBURGE 5	161	59269 WBURGE	269.0	1	TR	50.0	44.0	52.8	105.5	44.0	52.7	105.3				
				59239 HSNVL	5	161	59295 HSNVL	269.0	1	TR	50.0	50.0	72.4	144.8	49.0	72.5	145.0			
				59210 MARTCTY5	161	59287 MARTCTY	269.0	1	TR	50.0	38.0			39.0	51.9	103.8				
59228 WBURGE 5	161 59269 WBURGE	269.0	1	59239 HSNVL	5	161	59295 HSNVL	269.0	1	TR	50.0	50.0	51.5	103.1	49.0	51.0	102.0			
59232 LEX161 5	161 59264 LEX69	269.0	1	59239 HSNVL	5	161	59295 HSNVL	269.0	1	TR	50.0	50.0	50.3	100.6	49.0					
59242 CLINTON5	161 59303 CLINTON	269.0	1	59239 HSNVL	5	161	59295 HSNVL	269.0	1	TR	50.0	50.0	50.3	100.7	49.0					
				59242 CLINTON5	161	59303 CLINTON	269.0	2	TR	50.0	36.0	56.2	112.4	35.0	55.5	111.1			
59242 CLINTON5	161 59303 CLINTON	269.0	2	59239 HSNVL	5	161	59295 HSNVL	269.0	1	TR	50.0	50.0	50.3	100.6	49.0					
				59242 CLINTON5	161	59303 CLINTON	269.0	1	TR	50.0	35.0	56.5	113.0	35.0	55.9	111.8				
59228 WBURGE 5	161 59234 WAFB	5	161 1	59228 WBURGE 5	161	59269 WBURGE	269.0	1	TR	50.0	44.0			44.0	50.8	101.6				
69702 ST JOE 3	345 96039 7FAIRPT	345	1	69701 MIDWAY 5	161	69703 ST JOE 5	161	1	LN	164.0					168.0	102.4				
** Base Case **				57982 IATAN 7	345	69702 ST JOE 3	345	1	LN	956.0	544.0			1017.0	996.4	104.2				

Branch Violations

Table C-4 Base Case vs Customer 1100MW w/ Iatan-Nashua and BlueValley-Crosstown

*** MUST 4.00 *** FRI, APR 06 2001 12:33 ***
1-2001 SOUTHWEST POWER POOL POWER FLOW MODEL
2004 SUMMER PEAK (04SP) BASE CASE;WITH MODS (SEE LONG TITLE)

start: 3:06:13 PM
end: 3:23:50 PM
elapsed: 0:17:37

Notes:
Base case vs Customer study with 1100MW generation including Iatan-Nashua and Blue Valley-Crosstown line

*****Comparison of Base case flows to Contingency flows*****

Contingency	Monitored Element		Rating	Base Case			Study Case		
				Normal	Contingency Flow	Contingency % of Rating	Normal	Contingency Flow	Contingency % of Rating
56765 HOYT 7 345 56766 JEC N 7 345 1	57965 W.GRDNR7 345 58105 PROP#2 345 1	LN	1099.0	965.0	1104.5	100.5	838.0		
56769 LANG 7 345 56774 SWISVAL7 345 1	57968 STILWEL7 345 57981 LACYGNE7 345 1	LN	1099.0	1073.0	1111.6	101.1	968.0		
56769 LANG 7 345 56796 WICHITA7 345 1	57968 STILWEL7 345 57981 LACYGNE7 345 1	LN	1099.0	1073.0	1118.1	101.7	968.0		
56774 SWISVAL7 345 57968 STILWEL7 345 1	57968 STILWEL7 345 57981 LACYGNE7 345 1	LN	1099.0	1073.0	1110.0	101.0	968.0		
56791 BENTON 7 345 56797 WOLFCRK7 345 1	57968 STILWEL7 345 57981 LACYGNE7 345 1	LN	1099.0	1073.0	1164.0	105.9	968.0		
56793 NEOSHO 7 345 57981 LACYGNE7 345 1	57968 STILWEL7 345 57981 LACYGNE7 345 1	LN	1099.0	1073.0	1153.3	104.9	968.0	1107.2	100.7
56794 ROSEHIL7 345 56797 WOLFCRK7 345 1	57968 STILWEL7 345 57981 LACYGNE7 345 1	LN	1099.0	1073.0	1156.0	105.2	968.0		
56851 AUBURN 6 230 56852 JEC 6 230 1	57968 STILWEL7 345 57981 LACYGNE7 345 1	LN	1099.0	1073.0	1106.9	100.7	968.0		
56853 LAWHILL6 230 56854 LEC U5 6 230 1	57968 STILWEL7 345 57981 LACYGNE7 345 1	LN	1099.0	1073.0	1124.4	102.3	968.0		
56853 LAWHILL6 230 56855 MIDLAND6 230 1	56853 LAWHILL6 230 57250 LWRNCHL3 115 1	TR	280.0	237.0	356.5	127.3	227.0	340.2	121.5
57965 W.GRDNR7 345 57966 WGARDNR5 161 11	57968 STILWEL7 345 57981 LACYGNE7 345 1	LN	1099.0	1073.0	1133.1	103.1	968.0		
57965 W.GRDNR7 345 57977 CRAIG 7 345 1	58042 SPRGHL 5 161 57267 SPRINGH3 115 1	TR	100.0	87.0	100.6	100.6	80.0		
	57965 W.GRDNR7 345 57966 WGARDNR5 161 11	TR	400.0	200.0	479.9	120.0	204.0	435.1	108.8
	57966 WGARDNR5 161 58044 MOONLT 5 161 1	LN	293.0	220.0	435.4	148.6	209.0	383.7	131.0
	57968 STILWEL7 345 57981 LACYGNE7 345 1	LN	1099.0	1073.0	1440.3	131.1	968.0	1265.3	115.1
	57969 STILWEL5 161 58053 REDEL 5 161 1	LN	293.0	270.0	312.2	106.5	247.0		
	57969 STILWEL5 161 58057 BUCYRUS5 161 1	LN	224.0	178.0	226.5	101.1	157.0		
	58037 OLATHEW5 161 58043 MURLEN 5 161 1	LN	293.0	122.0	339.2	115.8	111.0		
	58043 MURLEN 5 161 58044 MOONLT 5 161 1	LN	293.0	179.0	397.1	135.5	168.0	345.5	117.9
57965 W.GRDNR7 345 58105 PROP#2 345 1	58042 SPRGHL 5 161 57267 SPRINGH3 115 1	TR	100.0	87.0	101.1	101.1	80.0		
	57995 MONTROS5 161 57954 MONTG3 118.0 1	TR	175.0	168.0	177.0	101.2	144.0		
	57968 STILWEL7 345 57981 LACYGNE7 345 1	LN	1099.0	1073.0	1767.0	160.8	968.0	1557.5	141.7

			57969 STILWEL5 161	58053 REDEL 5 161	1	LN	293.0	270.0	314.2	107.2	247.0		
			57993 STHTOWN5 161	59210 MARTCTY5 161	1	LN	224.0	163.0	245.3	109.5	129.0		
			58036 OLATHEE5 161	58046 OXFORD 5 161	1	LN	293.0	156.0	354.4	121.0	120.0		
57966 WGARDNR5 161	58044 MOONLT 5 161	1	57968 STILWEL7 345	57981 LACYGNE7 345	1	LN	1099.0	1073.0	1129.7	102.8	968.0		
57968 STILWEL7 345	57969 STILWEL5 161	22	57968 STILWEL7 345	57969 STILWEL5 161	11	TR	550.0	366.0	559.4	101.7	347.0		
57968 STILWEL7 345	57981 LACYGNE7 345	1	57995 MONTROS5 161	57954 MONTG3 118.0	1	TR	175.0	168.0	176.1	100.6	144.0		
			57965 W.GRDNR7 345	57977 CRAIG 7 345	1	LN	1099.0	771.0	1297.8	118.1	638.0	1105.9	100.6
			57965 W.GRDNR7 345	58105 PROP#2 345	1	LN	1099.0	965.0	1628.7	148.2	838.0	1423.7	129.5
			57966 WGARDNR5 161	58044 MOONLT 5 161	1	LN	293.0	220.0	304.7	104.0	209.0		
			57969 STILWEL5 161	58057 BUCYRUS5 161	1	LN	224.0	178.0	260.5	116.3	157.0	227.7	101.6
			57978 CRAIG 5 161	58039 LENEXAN5 161	1	LN	293.0	241.0	308.9	105.4	221.0		
			58067 CENTENL5 161	58068 WAGSTAF5 161	1	LN	293.0	210.0	296.1	101.1	188.0		
57968 STILWEL7 345	59200 PHILL 7 345	1	57969 STILWEL5 161	58053 REDEL 5 161	1	LN	293.0	270.0	350.1	119.5	247.0	309.7	105.7
			58002 MARTCIT5 161	58053 REDEL 5 161	1	LN	293.0	232.0	315.8	107.8	209.0		
			59239 HSNVL 5 161	59295 HSNVL 269.0	1	TR	50.0	50.0	51.3	102.7	49.0	50.4	100.7
57969 STILWEL5 161	57994 HICKMAN5 161	1	57969 STILWEL5 161	58053 REDEL 5 161	1	LN	293.0	270.0	328.2	112.0	247.0	296.3	101.1
			57993 STHTOWN5 161	59210 MARTCTY5 161	1	LN	224.0	163.0	234.8	104.8	129.0		
			59239 HSNVL 5 161	59295 HSNVL 269.0	1	TR	50.0	50.0	50.6	101.1	49.0		
57969 STILWEL5 161	58050 ANTIOCH5 161	1	57969 STILWEL5 161	58053 REDEL 5 161	1	LN	293.0	270.0	314.9	107.5	247.0		
			59239 HSNVL 5 161	59295 HSNVL 269.0	1	TR	50.0	50.0	50.6	101.2	49.0		
57969 STILWEL5 161	58053 REDEL 5 161	1	59239 HSNVL 5 161	59295 HSNVL 269.0	1	TR	50.0	50.0	52.5	105.1	49.0	51.6	103.2
57969 STILWEL5 161	58057 BUCYRUS5 161	1	57968 STILWEL7 345	57981 LACYGNE7 345	1	LN	1099.0	1073.0	1139.1	103.7	968.0		
69702 ST JOE 3 345	57972 HAWTH 7 345	1	57968 STILWEL7 345	57981 LACYGNE7 345	1	LN	1099.0	1073.0	1106.9	100.7	968.0		
57973 HAWTHRN5 161	57976 LEVEE 5 161	1	57973 HAWTHRN5 161	58011 CHOUTEU5 161	1	LN	293.0	209.0	312.3	106.6	184.0		
			57973 HAWTHRN5 161	58027 RANDLPH5 161	1	LN	293.0	244.0	300.1	102.4	234.0		
57973 HAWTHRN5 161	58011 CHOUTEU5 161	1	57973 HAWTHRN5 161	57976 LEVEE 5 161	1	LN	293.0	217.0	319.4	109.0	112.0		
			57973 HAWTHRN5 161	58027 RANDLPH5 161	1	LN	293.0	244.0	296.1	101.1	234.0		
			57976 LEVEE 5 161	57985 NEAST 5 161	1	LN	293.0	217.0	319.6	109.1	190.0		
57973 HAWTHRN5 161	58027 RANDLPH5 161	1	57973 HAWTHRN5 161	57976 LEVEE 5 161	1	LN	293.0	217.0	305.3	104.2	112.0		
			57976 LEVEE 5 161	57985 NEAST 5 161	1	LN	293.0	217.0	305.5	104.3	190.0		
57976 LEVEE 5 161	57985 NEAST 5 161	1	57973 HAWTHRN5 161	58011 CHOUTEU5 161	1	LN	293.0	209.0	312.4	106.6	184.0		
			57973 HAWTHRN5 161	58027 RANDLPH5 161	1	LN	293.0	244.0	300.1	102.4	234.0		
57977 CRAIG 7 345	57978 CRAIG 5 161	11	57968 STILWEL7 345	57981 LACYGNE7 345	1	LN	1099.0	1073.0	1118.5	101.8	968.0		
57977 CRAIG 7 345	57978 CRAIG 5 161	22	57968 STILWEL7 345	57981 LACYGNE7 345	1	LN	1099.0	1073.0	1118.1	101.7	968.0		
57977 CRAIG 7 345	57978 CRAIG 5 161	33	57968 STILWEL7 345	57981 LACYGNE7 345	1	LN	1099.0	1073.0	1109.8	101.0	968.0		

57978 CRAIG 5 161	57979 PFLUMM 5 161	1	57968 STILWEL7 345	57981 LACYGNE7 345	1	LN	1099.0	1073.0	1106.9	100.7	968.0		
			57978 CRAIG 5 161	58039 LENEXAN5 161	1	LN	293.0	241.0	311.9	106.5	221.0		
			58031 GRNWOOD5 161	58039 LENEXAN5 161	1	LN	293.0	223.0	295.2	100.7	203.0		
57978 CRAIG 5 161	58049 CEDRCRK5 161	1	57978 CRAIG 5 161	58039 LENEXAN5 161	1	LN	293.0	241.0	305.1	104.1	221.0		
57979 PFLUMM 5 161	58047 OVERLPK5 161	1	57968 STILWEL7 345	57981 LACYGNE7 345	1	LN	1099.0	1073.0	1105.5	100.6	968.0		
			57978 CRAIG 5 161	58039 LENEXAN5 161	1	LN	293.0	241.0	306.0	104.4	221.0		
57981 LACYGNE7 345	58105 PROP#2 345	1	57968 STILWEL7 345	57981 LACYGNE7 345	1	LN	1099.0	1073.0	1388.7	126.4	968.0	1186.1	107.9
69702 ST JOE 3 345	57982 IATAN 7 345	1	57968 STILWEL7 345	57981 LACYGNE7 345	1	LN	1099.0	1073.0	1135.7	103.3	968.0		
57985 NEAST 5 161	58011 CHOUTEU5 161	1	57973 HAWTHRN5 161	57976 LEVEE 5 161	1	LN	293.0	217.0	308.5	105.3	112.0		
			57976 LEVEE 5 161	57985 NEAST 5 161	1	LN	293.0	217.0	308.7	105.4	190.0		
57993 STHTOWN5 161	57994 HICKMAN5 161	1	57969 STILWEL5 161	58053 REDEL 5 161	1	LN	293.0	270.0	311.2	106.2	247.0		
			59239 HSNVL 5 161	59295 HSNVL 269.0	1	TR	50.0	50.0	50.4	100.8	49.0		
57993 STHTOWN5 161	58001 FOREST 5 161	1	58032 MERRIAM5 161	58040 ROEPARK5 161	1	LN	187.0	79.0	190.5	101.9	82.0		
57995 MONTROS5 161	58013 HARSNVL5 161	1	59239 HSNVL 5 161	59295 HSNVL 269.0	1	TR	50.0	50.0	50.3	100.6	49.0		
57995 MONTROS5 161	58013 HARSNVL5 161	2	59239 HSNVL 5 161	59295 HSNVL 269.0	1	TR	50.0	50.0	50.3	100.6	49.0		
57998 LVISTAE5 161	58013 HARSNVL5 161	1	59239 HSNVL 5 161	59295 HSNVL 269.0	1	TR	50.0	50.0	50.3	100.6	49.0		
57999 LVISTAW5 161	58008 BUNKRDG5 161	1	59239 HSNVL 5 161	59295 HSNVL 269.0	1	TR	50.0	50.0	50.2	100.5	49.0		
57999 LVISTAW5 161	58013 HARSNVL5 161	1	59239 HSNVL 5 161	59295 HSNVL 269.0	1	TR	50.0	50.0	50.3	100.6	49.0		
58002 MARTCIT5 161	58053 REDEL 5 161	1	59239 HSNVL 5 161	59295 HSNVL 269.0	1	TR	50.0	50.0	52.2	104.3	49.0	51.2	102.5
58002 MARTCIT5 161	59210 MARTCTY5 161	1	59239 HSNVL 5 161	59295 HSNVL 269.0	1	TR	50.0	50.0	51.7	103.5	49.0	50.8	101.6
58015 AVONDAL5 161	58027 RANDLPH5 161	1	57973 HAWTHRN5 161	57976 LEVEE 5 161	1	LN	293.0	217.0	297.4	101.5	112.0		
			57976 LEVEE 5 161	57985 NEAST 5 161	1	LN	293.0	217.0	297.5	101.5	190.0		
58031 GRNWOOD5 161	58049 CEDRCRK5 161	1	57978 CRAIG 5 161	58039 LENEXAN5 161	1	LN	293.0	241.0	297.9	101.7	221.0		
58036 OLATHEE5 161	58046 OXFORD 5 161	1	57969 STILWEL5 161	58053 REDEL 5 161	1	LN	293.0	270.0	295.8	101.0	247.0		
			59239 HSNVL 5 161	59295 HSNVL 269.0	1	TR	50.0	50.0	50.4	100.7	49.0		
58037 OLATHEW5 161	58043 MURLEN 5 161	1	57968 STILWEL7 345	57981 LACYGNE7 345	1	LN	1099.0	1073.0	1112.3	101.2	968.0		
58043 MURLEN 5 161	58044 MOONLT 5 161	1	57968 STILWEL7 345	57981 LACYGNE7 345	1	LN	1099.0	1073.0	1122.8	102.2	968.0		
58046 OXFORD 5 161	58050 ANTIOCH5 161	1	57969 STILWEL5 161	58053 REDEL 5 161	1	LN	293.0	270.0	309.0	105.4	247.0		
			59239 HSNVL 5 161	59295 HSNVL 269.0	1	TR	50.0	50.0	50.5	101.1	49.0		

58057 BUCYRUS5 161	58068 WAGSTAF5 161	1	57968 STILWEL7 345	57981 LACYGNE7 345	1	LN	1099.0	1073.0	1148.5	104.5	968.0		
			58066 S.OTTWA5 161	58077 SRICHLN5 161	1	LN	174.0	65.0	189.9	109.1	51.0		
58062 SALSBRY5 161	58064 NORTON-5 161	1	59217 WINDSR 5 161	96071 5CLINTN 161	1	LN	123.0	95.0	126.2	102.6	103.0	130.9	106.4
			59239 HSNVL 5 161	59295 HSNVL 269.0	1	TR	50.0	50.0	50.4	100.8	49.0		
58066 S.OTTWA5 161	58069 PAOLA 5 161	1	57969 STILWEL5 161	58057 BUCYRUS5 161	1	LN	224.0	178.0	258.8	115.5	157.0		
58067 CENTENL5 161	58068 WAGSTAF5 161	1	57968 STILWEL7 345	57981 LACYGNE7 345	1	LN	1099.0	1073.0	1150.5	104.7	968.0		
			58066 S.OTTWA5 161	58077 SRICHLN5 161	1	LN	174.0	65.0	193.9	111.4	51.0		
58067 CENTENL5 161	58069 PAOLA 5 161	1	57968 STILWEL7 345	57981 LACYGNE7 345	1	LN	1099.0	1073.0	1159.4	105.5	968.0		
			58066 S.OTTWA5 161	58077 SRICHLN5 161	1	LN	174.0	65.0	211.4	121.5	51.0	181.4	104.2
59200 PHILL 7 345	59225 PHILL 5 161	1	59239 HSNVL 5 161	59295 HSNVL 269.0	1	TR	50.0	50.0	50.6	101.1	49.0		
59202 SIBLEY 5 161	59235 DUNCAN 5 161	1	59239 HSNVL 5 161	59295 HSNVL 269.0	1	TR	50.0	50.0	50.3	100.6	49.0		
59202 SIBLEY 5 161	59244 ORRICK 5 161	1	59239 HSNVL 5 161	59295 HSNVL 269.0	1	TR	50.0	50.0	50.4	100.8	49.0		
59205 BLSPE 5 161	59227 OAKGRV 5 161	1	59239 HSNVL 5 161	59295 HSNVL 269.0	1	TR	50.0	50.0	50.4	100.7	49.0		
59206 PRALEE 5 161	59233 LEESUM 5 161	1	59239 HSNVL 5 161	59295 HSNVL 269.0	1	TR	50.0	50.0	50.4	100.8	49.0		
59207 ARCHIE 5 161	59240 ADRIAN 5 161	1	59239 HSNVL 5 161	59295 HSNVL 269.0	1	TR	50.0	50.0	53.4	106.8	49.0	53.5	106.9
59208 NEVADA 5 161	59216 BUTLER_5 161	1	59239 HSNVL 5 161	59295 HSNVL 269.0	1	TR	50.0	50.0	51.3	102.6	49.0	51.1	102.2
59209 SEDALIA5 161	59217 WINDSR 5 161	1	59239 HSNVL 5 161	59295 HSNVL 269.0	1	TR	50.0	50.0	50.9	101.9	49.0	50.3	100.6
59216 BUTLER_5 161	59240 ADRIAN 5 161	1	59239 HSNVL 5 161	59295 HSNVL 269.0	1	TR	50.0	50.0	52.8	105.5	49.0	52.8	105.6
59218 GRNWD 5 161	59233 LEESUM 5 161	1	59239 HSNVL 5 161	59295 HSNVL 269.0	1	TR	50.0	50.0	50.6	101.1	49.0		
59224 LNGVW 5 161	59249 HOOKRD 5 161	1	57969 STILWEL5 161	58053 REDEL 5 161	1	LN	293.0	270.0	321.2	109.6	247.0	295.0	100.7
			59239 HSNVL 5 161	59295 HSNVL 269.0	1	TR	50.0	50.0	51.9	103.9	49.0	51.1	102.1
59225 PHILL 5 161	59243 LKWINGB5 161	1	57969 STILWEL5 161	58053 REDEL 5 161	1	LN	293.0	270.0	328.3	112.0	247.0	302.1	103.1
			59239 HSNVL 5 161	59295 HSNVL 269.0	1	TR	50.0	50.0	52.3	104.5	49.0	51.4	102.8
59227 OAKGRV 5 161	59229 ODESSA 5 161	1	59239 HSNVL 5 161	59295 HSNVL 269.0	1	TR	50.0	50.0	50.2	100.5	49.0		
59228 WBURGE 5 161	59229 ODESSA 5 161	1	59239 HSNVL 5 161	59295 HSNVL 269.0	1	TR	50.0	50.0	50.4	100.9	49.0		
			59217 WINDSR 5 161	96071 5CLINTN 161	1	LN	123.0	95.0			103.0	128.1	104.1
59236 RICHMND5 161	59244 ORRICK 5 161	1	59239 HSNVL 5 161	59295 HSNVL 269.0	1	TR	50.0	50.0	50.3	100.7	49.0		
59243 LKWINGB5 161	59249 HOOKRD 5 161	1	57969 STILWEL5 161	58053 REDEL 5 161	1	LN	293.0	270.0	323.9	110.6	247.0	297.7	101.6
			59239 HSNVL 5 161	59295 HSNVL 269.0	1	TR	50.0	50.0	52.1	104.1	49.0	51.2	102.4
96045 7MORGAN 345	56793 NEOSHO 7 345	1	57968 STILWEL7 345	57981 LACYGNE7 345	1	LN	1099.0	1073.0	1144.9	104.2	968.0		

96071 5CLINTN 161	57995 MONTROS5 161	1	59239 HSNVL 5 161	59295 HSNVL 269.0	1	TR	50.0	50.0	53.0	105.9	49.0	52.8	105.6
96071 5CLINTN 161	59217 WINDSR 5 161	1	59239 HSNVL 5 161	59295 HSNVL 269.0	1	TR	50.0	50.0	51.0	102.1	49.0	50.4	100.8
96071 5CLINTN 161	59242 CLINTON5 161	1	59228 WBURGE 5 161	59269 WBURGE 269.0	1	TR	50.0	44.0	69.6	139.2	44.0	69.3	138.7
			59239 HSNVL 5 161	59295 HSNVL 269.0	1	TR	50.0	50.0	51.8	103.6	49.0	51.1	102.1
96689 2BUTLER 69.0	59216 BUTLER_5 161	1	59239 HSNVL 5 161	59295 HSNVL 269.0	1	TR	50.0	50.0	50.6	101.2	49.0		
56651 JEC U1 26.0	56852 JEC 6 230	1	57968 STILWEL7 345	57981 LACYGNE7 345	1	LN	1099.0	1073.0	1138.1	103.6	968.0		
56652 JEC U2 26.0	56766 JEC N 7 345	1	57968 STILWEL7 345	57981 LACYGNE7 345	1	LN	1099.0	1073.0	1134.4	103.2	968.0		
56653 JEC U3 26.0	56766 JEC N 7 345	1	57968 STILWEL7 345	57981 LACYGNE7 345	1	LN	1099.0	1073.0	1134.4	103.2	968.0		
56663 LEC U5 24.0	56854 LEC U5 6 230	1	57968 STILWEL7 345	57981 LACYGNE7 345	1	LN	1099.0	1073.0	1124.4	102.3	968.0		
56772 STRANGR7 345	56811 STRANG7X1.00	1	58042 SPRGHL 5 161	57267 SPRINGH3 115	1	TR	100.0	87.0	100.9	100.9	80.0		
			57968 STILWEL7 345	57981 LACYGNE7 345	1	LN	1099.0	1073.0	1105.3	100.6	968.0		
56853 LAWHILL6 230	57250 LWRNCHL3 115	1	56855 MIDLAND6 230	57252 MIDLAND3 115	1	TR	280.0	172.0	319.2	114.0	164.0	304.2	108.6
56855 MIDLAND6 230	57252 MIDLAND3 115	1	56853 LAWHILL6 230	57250 LWRNCHL3 115	1	TR	280.0	237.0	356.5	127.3	227.0	340.2	121.5
57951 HAW G5 122.0	57973 HAWTHRN5 161	1	57995 MONTROS5 161	57954 MONTG3 118.0	1	TR	175.0	168.0	176.2	100.7	144.0		
			57968 STILWEL7 345	57981 LACYGNE7 345	1	LN	1099.0	1073.0	1160.7	105.6	968.0		
57952 MONTG1 122.0	57995 MONTROS5 161	1	57995 MONTROS5 161	57954 MONTG3 118.0	1	TR	175.0	168.0	179.0	102.3	144.0		
			57968 STILWEL7 345	57981 LACYGNE7 345	1	LN	1099.0	1073.0	1112.5	101.2	968.0		
57953 MONTG2 122.0	57995 MONTROS5 161	1	57995 MONTROS5 161	57954 MONTG3 118.0	1	TR	175.0	168.0	178.9	102.3	144.0		
			57968 STILWEL7 345	57981 LACYGNE7 345	1	LN	1099.0	1073.0	1111.8	101.2	968.0		
57954 MONTG3 118.0	57995 MONTROS5 161	1	57968 STILWEL7 345	57981 LACYGNE7 345	1	LN	1099.0	1073.0	1111.6	101.1	968.0		
57957 IAT G1 124.0	57982 IATAN 7 345	1	57968 STILWEL7 345	57981 LACYGNE7 345	1	LN	1099.0	1073.0	1128.7	102.7	968.0		
59151 SIBLEY#322.0	59202 SIBLEY 5 161	1	57968 STILWEL7 345	57981 LACYGNE7 345	1	LN	1099.0	1073.0	1141.5	103.9	968.0		
			59239 HSNVL 5 161	59295 HSNVL 269.0	1	TR	50.0	50.0	50.4	100.9	49.0		
59162 ARIESSTG18.0	59225 PHILL 5 161	1	57968 STILWEL7 345	57981 LACYGNE7 345	1	LN	1099.0	1073.0	1124.3	102.3	968.0		
59163 ARIESCT118.0	59225 PHILL 5 161	1	57968 STILWEL7 345	57981 LACYGNE7 345	1	LN	1099.0	1073.0	1115.8	101.5	968.0		
59164 ARIESCT218.0	59225 PHILL 5 161	1	57968 STILWEL7 345	57981 LACYGNE7 345	1	LN	1099.0	1073.0	1115.8	101.5	968.0		
59208 NEVADA 5 161	59308 NEVADA 269.0	1	59208 NEVADA 5 161	59308 NEVADA 269.0	2	TR	50.0	26.0	50.4	100.9	26.0		
59208 NEVADA 5 161	59308 NEVADA 269.0	2	59208 NEVADA 5 161	59308 NEVADA 269.0	1	TR	50.0	30.0	51.8	103.6	29.0	50.6	101.3

59209 SEDALIA5 161	59271 SEDN	269.0 1	59209 SEDALIA5 161	59272 SEDS	269.0 1	TR	50.0	29.0	51.9	103.8	27.0		
			59228 WBURGE 5 161	59269 WBURGE	269.0 1	TR	50.0	44.0	52.4	104.8	44.0	52.2	104.5
			59239 HSNVL 5 161	59295 HSNVL	269.0 1	TR	50.0	50.0	50.3	100.5	49.0		
59209 SEDALIA5 161	59272 SEDS	269.0 1	59209 SEDALIA5 161	59271 SEDN	269.0 1	TR	50.0	35.0	55.6	111.2	34.0	53.9	107.8
			59228 WBURGE 5 161	59269 WBURGE	269.0 1	TR	50.0	44.0	50.9	101.8	44.0	50.7	101.5
59210 MARTCTY5 161	59287 MARTCTY	269.0 1	59239 HSNVL 5 161	59295 HSNVL	269.0 1	TR	50.0	50.0	55.4	110.8	49.0	54.9	109.8
59224 LNGVW 5 161	59282 LNGVW	269.0 1	59210 MARTCTY5 161	59287 MARTCTY	269.0 1	TR	50.0	38.0	57.8	115.6	39.0	59.8	119.5
			59239 HSNVL 5 161	59295 HSNVL	269.0 1	TR	50.0	50.0	56.1	112.2	49.0	55.4	110.9
59225 PHILL 5 161	59280 PHILL	269.0 1	59228 WBURGE 5 161	59269 WBURGE	269.0 1	TR	50.0	44.0	52.8	105.5	44.0	53.1	106.2
			59239 HSNVL 5 161	59295 HSNVL	269.0 1	TR	50.0	50.0	72.4	144.8	49.0	72.2	144.5
			59210 MARTCTY5 161	59287 MARTCTY	269.0 1	TR	50.0	38.0			39.0	51.7	103.5
59228 WBURGE 5 161	59269 WBURGE	269.0 1	59239 HSNVL 5 161	59295 HSNVL	269.0 1	TR	50.0	50.0	51.5	103.1	49.0	50.8	101.6
59232 LEX161 5 161	59264 LEX69	269.0 1	59239 HSNVL 5 161	59295 HSNVL	269.0 1	TR	50.0	50.0	50.3	100.6	49.0		
			59228 WBURGE 5 161	59269 WBURGE	269.0 1	TR	50.0	44.0			44.0	50.6	101.1
59242 CLINTON5 161	59303 CLINTON	269.0 1	59239 HSNVL 5 161	59295 HSNVL	269.0 1	TR	50.0	50.0	50.3	100.7	49.0		
			59242 CLINTON5 161	59303 CLINTON	269.0 2	TR	50.0	36.0	56.2	112.4	35.0	55.2	110.4
59242 CLINTON5 161	59303 CLINTON	269.0 2	59239 HSNVL 5 161	59295 HSNVL	269.0 1	TR	50.0	50.0	50.3	100.6	49.0		
			59242 CLINTON5 161	59303 CLINTON	269.0 1	TR	50.0	35.0	56.5	113.0	35.0	55.5	111.0
59207 ARCHIE 5 161	59239 HSNVL 5 161	1	59239 HSNVL 5 161	59295 HSNVL	269.0 1	TR	50.0	50.0			49.0	50.3	100.6
59228 WBURGE 5 161	59234 WAFB 5 161	1	59228 WBURGE 5 161	59269 WBURGE	269.0 1	TR	50.0	44.0			44.0	51.9	103.9
69702 ST JOE 3 345	96039 7FAIRPT	345 1	69701 MIDWAY 5 161	69703 ST JOE 5 161	1	LN	164.0					165.8	101.1