

System Impact Study
SPP-2003-271-2
For Transmission Service
Requested By
InterGen Services, Inc.

From OKGE To OKGE

For a Reserved Amount Of 1200 MW
From 5/1/04
To 5/1/07

SPP Engineering, Tariff Studies

SPP IMPACT STUDY (#SPP-2003-271-2) Revised August 2, 2004 Page 1 of 9

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ATTACHMENT: SPP-2003-271-2 Tables

1. Executive Summary

InterGen Services, Inc. has requested a system impact study for long-term Firm Point-to-Point transmission service from OKGE to OKGE. The period of the service is from 5/1/04 to 5/1/07. The request is for OASIS reservations 619539 - 619544 for a total amount of 1200 MW.

The principal objective of this study is to identify system problems and potential system modifications necessary to facilitate the additional 1200 MW request while maintaining system reliability. Analysis was conducted for the requested service period above and for the remaining planning horizon from 5/1/07 to 4/1/11. The additional evaluation of the planning horizon was conducted to determine any future constraints that may limit the renewal of service.

The OKGE to OKGE 1200 MW request was initially studied using three System Scenarios. With the application of the recently adopted 3% transfer distribution factor threshold, Scenario 2 analysis was discarded as not adding any unique results not already captured by the use of Scenario 1 and 3. Voltage analysis using Scenario 1 and 3 is included in the study revision.

The study results of the 1200 MW show that limiting constraints exist. Tables 1.1 and 1.2 list the SPP facility overloads caused or impacted by the transfers modeled using Scenario 1 and 3, respectively. Tables 2.1 and 2.2 lists the SPP voltage violations caused or impacted by the transfers modeled using Scenario 1 and 3, respectively. Tables 3.1 and 3.2 list the SPP Facility Overloads caused or impacted by modeling the selected upgrades to be assigned using Scenario 1 and 3, respectively. Selected solutions with engineering and construction costs are provided for the SPP Facility Overloads and Voltage violations found in the Tables. The least cost mitigation of the overloads and voltage violations identified for the 1200 MW was determined to be the addition of a new 345 kV line from Redbud to Horseshoe Lake with a reroute of the existing Arcadia to Seminole 345 kV line into a new 345 kV substation bay at Horseshoe Lake and the addition of two 345/138 kV transformers at Horseshoe Lake. The estimated cost is \$24 million. The estimated in-service date of the solution is 3/1/2007.

The ATC for the OKGE to OKGE request is 600 MW (9/1/04-9/1/05) and 620 MW (9/1/05-5/1/07) by interpolation between 652 MW (05SP) and 588 MW (07SP). For interim service, voluntary OKGE redispatch will be implemented for the Draper 345/138 kV Transformers, Memorial to Skyline 138 kV line, and Morgan to Mustang 138 kV line post-contingency overloads, until OKGE completes planned upgrades on these facilities with an estimated inservice date of 6/1/2005. Renewal rights are limited by the Northwest 345/138 kV Transformer with annual ATC of 588 MW (5/1/07-5/1/08), 586 MW by interpolation (5/1/08-5/1/09), 584 MW by interpolation (5/1/09-5/1/10), and 582 MW thereafter. The total estimated engineering and construction cost required in order to provide the 1200 MW of requested service is \$24,550,000. The total can be determined by summing totals from Tables 1.1, 2.1, and 3.2. The estimated in-service date of the facilities is 3/1/2007. The full 1200 MW requested will need to be deferred to a 3/1/2007 start date. The Northwest 345/138 kV transformer limits the 1200 MW of service with the selected upgrades for 1200 MW to 1195 MW during the deferred reservation period from 6/1/2009-10/1/2009 and limits the renewal rights of the service to 1165 MW starting 6/1/2010. The addition of the Northwest 345/138 kV transformer mitigation to add a third transformer would add \$7,500,000 to estimated engineering and cost and was determined not to cause any additional impacts to the system. A facility study may now be conducted to summarize the operating limits and to determine the financial characteristics associated with the requested service.

2. Introduction

InterGen Services, Inc. has requested a system impact study for long-term Firm Point-to-Point transmission service from OKGE to OKGE for 1200 MW. The principal objective of this study is to identify the restraints on the SPP Regional Tariff System that may limit the requested service and determine the least cost solutions required to alleviate the limiting facilities.

This study includes steady-state contingency analyses (PSS/E function ACCC) and Available Transfer Capability (ATC) analyses. The steady-state analyses consider the impact of the request on transmission line and transformer loadings, and bus voltages for outages of single transmission lines and transformers, and selected multiple transmission lines and transformers on the SPP system and first tier Non - SPP systems.

The OKGE to OKGE 1200 MW transfer was initially studied using three System Scenarios. The service was modeled by six increments of 200 MW from a source in OKGE to marginally dispatched OKGE units. The three scenarios were studied to capture worst case system limitations dependent on the bias of the transmission system. With the application of the recently adopted 3% transfer distribution factor threshold, Scenario 2 analysis was discarded as not adding any unique results not already captured by the use of Scenario 1 and 3.

3. Study Methodology

A. Description

The system impact analysis was conducted to determine the steady-state impact of the requested service on the SPP and first tier Non - SPP control area systems. The steady-state analysis was done to ensure current SPP Criteria and NERC Planning Standards requirements are fulfilled. The Southwest Power Pool conforms to the NERC Planning Standards, which provide the strictest requirements, related to voltage violations and thermal overloads during normal conditions and during a contingency. It requires that all facilities be within normal operating ratings for normal system conditions and within emergency ratings after a contingency. Normal operating ratings and emergency operating ratings monitored are Rate A and B in the SPP MDWG models, respectively. The lower bound of the normal voltage range monitored for OKGE is 92.5% and 95% for the remaining SPP Control Areas. The lower bound of the emergency voltage range monitored is 90%. The SPS Tuco 230 kV bus voltage is monitored at 92.5% due to pre-determined system stability limitations.

The contingency set includes all SPP control area branches and ties 69kV and above, first tier Non - SPP control area branches and ties 115 kV and above, and any defined contingencies for these control areas. The monitor elements include all SPP control area branches, ties, and buses 69 kV and above, and all first tier Non – SPP control area branches and ties 69 kV and above. Voltage monitoring was performed for SPP control area buses 69 kV and above.

A 3 % transfer distribution factor (TDF) cutoff was applied to all SPP control area facilities. For first tier Non – SPP control area facilities, a 3 % TDF cutoff was applied to AECI, AMRN, and ENTR and a 2 % TDF cutoff was applied to MEC, NPPD, and OPPD. For voltage monitoring, a 0.02 per unit change in voltage must occur due to the transfer to be considered a valid limit to the transfer.

B. Model Updates

SPP used fourteen seasonal models to study the OKGE to OKGE 1200 MW transfer for the requested service period and the remaining planning horizon. The SPP 2004 Series Cases Update 2 2004 Summer Peak (04SP), 2004 Summer Shoulder (04SH), 2004 Fall Peak (04FA), 2004/05 Winter Peak (04WP), 2005 April Minimum (05AP), 2005 Spring Peak (05G), 2005 Summer Peak (05SP), 2005 Summer Shoulder (05SH), 2005 Fall Peak (05FA), 2005/06 Winter Peak (05WP), 2007 Summer Peak (07SP), and 2007/08 Winter Peak (07WP) were used to study the impact of the 1200 MW transfer on the system during the requested service period of 5/1/04 to 5/1/07. The SPP 2004 Series Update 2 2010 Summer Peak (10SP), and 2010/11 Winter Peak (10WP) were used to study the impact of the 1200 MW transfer on the system during the remaining planning horizon from 5/1/07 to 4/1/11.

The chosen base case models were modified to reflect the most current modeling information. From the fourteen seasonal models, three system scenarios were developed. Scenario 1 includes SWPP OASIS transmission requests not already included in the SPP 2004 Series Cases flowing in a West to East direction with ERCOT exporting and the Southwestern Public Service (SPS) Control Area exporting to outside control areas and exporting to the planned Lamar HVDC Tie. Scenario 2 includes transmission requests not already included in the SPP 2004 Series Cases flowing in an East to West direction with ERCOT importing and SPS importing from an outside control area and importing from the planned Lamar HVDC Tie. The third scenario includes SWPP OASIS transmission requests not already included in the SPP 2004 Series Cases flowing

in a West to East direction with ERCOT importing and SPS importing from an outside control area and importing from the planned Lamar HVDC Tie. The system scenarios were developed to minimize counter flows to the transfers studied.

C. Transfer Analysis

Four different transfer analyses were initially performed. The first transfer analysis was performed on Scenario 1 using the entire contingency set and monitored list. The analysis provides the impact of the full 1200 MW transfer on SPP and Non-SPP facilities. The other three transfer analyses were performed to more thoroughly determine the impact of the full 1200 MW transfer in increments of 200 MW on the OKGE system using all three developed scenarios. With the application of the recently adopted 3% transfer distribution factor threshold, Scenario 2 analysis was discarded as not adding any unique results not already captured by the use of Scenario 1 and 3. Transfer analysis in 200 MW increments was conducted on Scenario 1 and 3 using a contingency set including facilities in OKGE and OKGE first-tier control areas while monitoring the whole SPP and First-tier Non-SPP control area footprint. Using the selected cases both with and without the respective transfer increments modeled, the PSS/E Activity ACCC was run on the cases and compared to determine the facility overloads caused or impacted by the transfers. The PSS/E options chosen to conduct the analysis can be found in Appendix A.

D. Upgrade Analysis

Using the 2005 April Min, 2005 Spring Peak, 2005 Summer Shoulder, 2005 Fall Peak, 2007 Summer Peak, 2007/08 Winter Peak, 2010 Summer Peak, and 2010/11 Winter Peak cases both with and without the assigned upgrades modeled and with and without the 1200 MW transfer, the PSS/E Activity ACCC was run on the cases and compared to determine the facility overloads caused or impacted by the assigned upgrades. The contingency set used included facilities in OKGE and OKGE first-tier control areas while monitoring the whole SPP and First-tier Non-SPP control area footprint. The upgrades were also evaluated with the transfer at 600 MW. The 3% transfer distribution factor cutoff was applied to SPP Facilities identified. The PSS/E options chosen to conduct the analysis can be found in Appendix A.

4. Study Results

A. Study Analysis Results

Tables 1.1, 2.1, 3.1, 1.2, 2.2, and 3.2 contain the steady-state analysis results of the System Impact Study. The Tables are in the attached workbook *SPP-2003-271-2 Tables*. The tables identify the seasonal case in which the event occurred, the facility control area location, applicable ratings of the overloaded facility, the loading percentage or voltage with and without the 1200 MW transfer, the percent transfer distribution factor (TDF) if applicable, and the estimated ATC value if calculated. Comments are provided in the tables to document any SPP or Non - SPP identification or assignment of the event, existing mitigations plans or criteria to disregard the event as a limiting constraint, upgrades and costs to mitigate a limiting constraint, or any specific study procedures associated with modeling an event. The estimated ATC was calculated by interpolating between the six incremental steps of 200 MW for Tables 1.1 and 1.2. The estimated ATC was calculating by interpolating between 0 and 1200 MW for Tables 2.1 and 2.2.

<u>Tables 1.1</u> and <u>1.2</u> list the SPP Facility Overloads caused or impacted by the transfers modeled using Scenario 1 and 3, respectively. <u>Tables 2.1</u> and <u>2.2</u> list the SPP facility voltage violations caused or impacted by the transfers modeled using Scenario 1 and 3, respectively. No facilities outside of OKGE were identified as being impacted with application of established transfer distribution factor cutoffs. Tables <u>3.1</u> and <u>3.2</u> list additional SPP Facility Overloads caused or impacted by modeling the assigned upgrades. Solutions with engineering and construction costs are provided in the tables.

<u>Tables 1.1a</u>, <u>3.1a</u>, <u>1.2a</u>, and <u>3.2a</u> documents the modeling representation of the events identified in <u>Tables 1.1</u>, <u>3.1</u>, <u>1.2</u>, and <u>3.2</u> to include bus numbers and bus names.

5. Conclusion

The ATC for the OKGE to OKGE request is 600 MW (9/1/04-9/1/05) and 620 MW (9/1/05-5/1/07) by interpolation between 652 MW (05SP) and 588 MW (07SP). For interim service, voluntary OKGE redispatch will be implemented for the Draper 345/138 kV Transformers, Memorial to Skyline 138 kV line, and Morgan to Mustang 138 kV line post-contingency overloads, until OKGE completes planned upgrades on these facilities with an estimated inservice date of 6/1/2005. Renewal rights are limited by the Northwest 345/138 kV Transformer with annual ATC of 588 MW (5/1/07-5/1/08), 586 MW by interpolation (5/1/08-5/1/09), 584 MW by interpolation (5/1/09-5/1/10), and 582 MW thereafter. The total estimated engineering and construction cost required in order to provide the 1200 MW of requested service is \$24,550,000. The total can be determined by summing totals from Tables 1.1, 2.1, and 3.2. The estimated in-service date of the facilities is 3/1/2007. The full 1200 MW requested will need to be deferred to a 3/1/2007 start date. The Northwest 345/138 kV transformer limits the 1200 MW of service with the selected upgrades for 1200 MW to 1195 MW during the deferred reservation period from 6/1/2009-10/1/2009 and limits the renewal rights of the service to 1165 MW starting 6/1/2010. The addition of the Northwest 345/138 kV transformer mitigation to add a third transformer would add \$7,500,000 to estimated engineering and cost and was determined not to cause any additional impacts to the system. A facility study may now be conducted to summarize the operating limits and to determine the financial characteristics associated with the requested service.

Appendix A

PSS/E CHOICES IN RUNNING LOAD FLOW PROGRAM AND ACCC

BASE CASES:

Solutions - Fixed slope decoupled Newton-Raphson solution (FDNS)

- 1. Tap adjustment Stepping
- 2. Area interchange control Tie lines only
- 3. Var limits Apply immediately
- 4. Solution options \underline{X} Phase shift adjustment

_ Flat start

_ Lock DC taps

_ Lock switched shunts

ACCC CASES:

Solutions – AC contingency checking (ACCC)

- 1. MW mismatch tolerance 0.5
- 2. Contingency case rating Rate B
- 3. Percent of rating 100
- 4. Output code Summary
- 5. Min flow change in overload report 1mw
- 6. Excld cases w/ no overloads form report YES
- 7. Exclude interfaces from report NO
- 8. Perform voltage limit check YES
- 9. Elements in available capacity table 60000
- 10. Cutoff threshold for available capacity table 99999.0
- 11. Min. contng. case Vltg chng for report -0.02
- 12. Sorted output None

Newton Solution:

- 1. Tap adjustment Stepping
- 2. Area interchange control Tie lines only
- 3. Var limits Apply automatically
- 4. Solution options \underline{X} Phase shift adjustment

_ Flat start

_ Lock DC taps

Lock switched shunts

Study	From			Rate	BC %	TC %	1		ATC		Estimated
Case	Area	To Area	Monitored Branch Overload	<mva></mva>	Loading	Loading	%TDF	Outaged Branch Causing Overload	(MW)	Solution	Cost
					Ĭ			3		OKGE Project to add 3rd Draper xfrmr at OGE's expense.	
										Estimated In-Service Date 6/1/2005. Voluntary OKGE Redispatch	
04SP	OKGE		DRAPER 345/138KV TRANSFORMER CKT 1	493	88.5	107.6	7.9	DRAPER 345/138KV TRANSFORMER CKT 2	483	to be used as Interim Mitigation.	
04SP	OKGE	OKGE	DRAPER 345/138KV TRANSFORMER CKT 2	493	88.5	107.6	7.9	DRAPER 345/138KV TRANSFORMER CKT 1	483	See Previous Solution Specified for Facility	
04SP	OKGE	OKGE	DRAPER 345/138KV TRANSFORMER CKT 1	493	86.1	103.8	7.3	DRAPER 345/138KV TRANSFORMER CKT 2	598	See Previous Solution Specified for Facility	
04SP	OKGE	OKGE	DRAPER 345/138KV TRANSFORMER CKT 2	493	86.1	103.8	7.3	DRAPER 345/138KV TRANSFORMER CKT 1	598	See Previous Solution Specified for Facility	
										OKGE Project to replace breakers and switches at Memorial,	
										Replace switch at Skyline, and Reconductor the line to at least	
										1800+ Amps at OGE's expense. Estimated In-Service Date	
										6/1/2005. Voluntary OKGE Redispatch to be used as Interim	
04SP	OKGE	OKGE	MEMORIAL - SKYLINE 138KV	287	61.6	120.9	14.2	DANFORTH - OMPA-EDMOND HAFER 138KV	635	Mitigation.	
										OKGE Project to Increase CTR at Mustang sub at OGE's expense.	
										Estimated In-Service Date 6/1/2005. Voluntary OKGE Redispatch	
		OKGE	MORGAN - MUSTANG 138KV	287	76.1	118.4	10.1	MCCLAIN - PLEASANT VALLEY 138KV	688	to be used as Interim Mitigation.	
04SP	OKGE	OKGE	MEMORIAL - SKYLINE 138KV	287	56.6	115.7	14.1	EASTERN AVE - OMPA-EDMOND HAFER 138KV	719	See Previous Solution Specified for Facility	
										Reroute the existing 345kV Arcadia-Seminole line to new 345kV	
										sub bay at Horseshoe Lake sub and install two 345-138kV bus tie	
										transformers at HSL. Build 14miles of 345kV line from Redbud to	
										HSL. Will require 6-345kV breakers, 2-xfrmr, 4-138kV breakers,	
										transmission line reroute, 14miles of new 345kV line. Estimated In-	
04SP	OKGE	OKGE	NORTHWEST 345/138KV TRANSFORMER CKT 1	493	79.6	108.2	11.7	NORTHWEST 345/138KV TRANSFORMER CKT 2	730	Service Date 3/1/2007	\$24,000,000
04SP	OKGE		NORTHWEST 345/138KV TRANSFORMER CKT 1	493	78.2	105.3	11.1	NORTHWEST 345/138KV TRANSFORMER CKT 2	815	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
04SP	OKGE	OKGE	MEMORIAL - SKYLINE 138KV	287	47.5	106.5	14.1	EASTERN AVE - MEMORIAL 138KV	821	See Previous Solution Specified for Facility	
04SP	OKGE	OKGE	LONEOAK - QUAIL CREEK 138KV	308	72.2	107.8	9.1	NORTHWEST - PANTHER 138KV	827	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
										OKGE Terminal Equipment Project underway to increase line	
										rating. Estimated In-Service Date 9/30/2004. New Emergeny	
										Rating 308 MVA. Relieved or Impact Removed by Selected	
04SP	OKGE	OKGE	ARCADIA - KAMO MEMORIAL 138KV	287	31.4	112.6	19.4	ARCADIA - DANFORTH 138KV	850	Upgrades for 1200 MW	
04SP	OKGE		LONEOAK - QUAIL CREEK 138KV	308	71.5	107.0	9.1	PANTHER - SILVER LAKE 138KV	851	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
04SP	OKGE	OKGE	MEMORIAL - SKYLINE 138KV	287	53.9	109.2	13.2	DIVISION AVE - SILVER LAKE 138KV	861	See Previous Solution Specified for Facility	
										Change sw. to 2000A at czech hall. Increase trap an CTR to	
										2000A at cimarron sub. May require changing relays. This will	
04SP	OKGE		CIMARRON - CZECH HALL 138KV	382	72.5	105.5	10.5	MCCLAIN - PLEASANT VALLEY 138KV	893	bring the Rate B to the conductor Rate B of 444MVA.	\$ 150,000
04SP	OKGE	OKGE	MORGAN - MUSTANG 138KV	287	61.7	105.8	10.5	CIMARRON - HAYMAKER 138KV	901	See Previous Solution Specified for Facility	
04SP	OKGE	OKGE	MORGAN - MUSTANG 138KV	287	60.3	104.3	10.5	DIVISION AVE - HAYMAKER 138KV	923	See Previous Solution Specified for Facility	
0.405	01/05	01/05	ADOADIA GAERAGORA TRANCECRAS COTA	400	50.0	407.0	00.7	ADOADIA GAEAGOKA TRANSFORMED CAT C	00-	Deliayed on Import Demoyed by Calcated Harrad - 5 4000 MM	
04SP	OKGE	OKGE	ARCADIA 345/138KV TRANSFORMER CKT 1	493	50.2	107.8	23.7	ARCADIA 345/138KV TRANSFORMER CKT 2	937	Relieved or Impact Removed by Selected Upgrades for 1200 MW OKGE Terminal Equipment Project underway to increase line	
I										rating. Estimated In-Service Date 9/30/2004. New Emergeny	
0405	OKOE	OKOE	ADCADIA KAMO MEMORIAL 400KK	207	400	111 0	20.4	ADCADIA MORTINICOT CACIOA	044	Rating 308 MVA. Relieved or Impact Removed by Selected	
U4SP	UKGE	OKGE	ARCADIA - KAMO MEMORIAL 138KV	287	19.0	111.3	22.1	ARCADIA - NORTHWEST 345KV Multiple Contingency Outage:	941	Upgrades for 1200 MW	
I								84TH ST - TENNESSEE TAP 138KV			
I											
0405	01/05	01/05	DEMNOTON DADIC OTONEWALL (2017)	404	75.7	400 =	4.5	MEMORIAL - TENNESSEE TAP 138KV	000	Harmonda tara @ Otana awall	£ 50.000
04SP	OKGE	OKGE	REMNGTON PARK - STONEWALL 138KV	191	75.7	103.7	4.5	TENNESSEE - TENNESSEE TAP 138KV	986	Upgrade trap @ Stonewall	\$ 50,000
0400	OKCE	OKCE	ADCADIA 245/420KV/TDANCEODMED OVT C	400	40.0	105.4	22.4	ADCADIA 245/420KV TRANSCORMER OVT 4	1005	Delianad on Impact Demonal by Colocted Lingual 4 4000 MM	
04SP	OKGE	OKGE	ARCADIA 345/138KV TRANSFORMER CKT 2	493	49.0	105.1	23.1	ARCADIA 345/138KV TRANSFORMER CKT 1	1005	Relieved or Impact Removed by Selected Upgrades for 1200 MW	ļ
0405	OKOE	OKOE	ADCADIA 245/420K// TDANSCORMED CVT 4	400	40.4	1010	20.7	ADCADIA 245/420KV/TDANOSODASD CVT C	1000	Delianad on Impact Demonal by October 111 and 122 for 1999 1844	
04SP	OKGE	OKGE	ARCADIA 345/138KV TRANSFORMER CKT 1	493	49.4	104.6	22.7	ARCADIA 345/138KV TRANSFORMER CKT 2	1023	Relieved or Impact Removed by Selected Upgrades for 1200 MW	ļ
04SP	OKGE	OKGE	MEMORIAL - SKYLINE 138KV	287	57.7	101.7	10.5	DIVISION AVE - LAKESIDE 138KV	1034	See Previous Solution Specified for Facility	
04SP	OKGE	OKGE	ARCADIA - REDBUD 345KV CKT 2	1195	21.7	109.6	87.6	ARCADIA - REDBUD 345KV CKT 1	1066	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
04SP	OKGE	OKGE	ARCADIA - REDBUD 345KV CKT 1	1195	21.6	109.4	87.4	ARCADIA - REDBUD 345KV CKT 2	1060	Relieved or Impact Removed by Selected Upgrades for 1200 MW	,
0-101	ONGE	UNGE	ANORDIA - NEDDOD 343KV OKT T	1130	∠1.0	103.4	07.4	ANOADIA - NEDDOD 343NV ON I Z	1009	removed of impact removed by defected opgrades for 1200 MW	

Study	From			Rate	BC %	TC %			ATC		Estimated
Case	Area	To Area	Monitored Branch Overload	<mva></mva>	Loading	Loading	%TDF	Outaged Branch Causing Overload	(MW)	Solution	Cost
04SP	OKGE	OKGE	HORSESHOE LAKE - KAMO MEMORIAL 138KV	287	20.4	103.0	19.8	ARCADIA - DANFORTH 138KV	1102	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
04SP	OKGE	OKGE	ARCADIA 345/138KV TRANSFORMER CKT 2	493	48.1	101.9	22.1	ARCADIA 345/138KV TRANSFORMER CKT 1	1125	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
04SP	OKGE	OKGE	HORSESHOE LAKE - KAMO MEMORIAL 138KV	287	8.5	101.4	22.2	ARCADIA - NORTHWEST 345KV	1165	Relieved or Impact Removed by Selected Upgrades for 1200 MW OKGE Terminal Equipment Project underway to increase line	
04SP	OKGE OKGE	OKGE OKGE	DIVISION AVE - SILVER LAKE 138KV REMNGTON PARK - STONEWALL 138KV	287 191	51.6 75.3	100.3 102.7	11.6 4.4	MEMORIAL - SKYLINE 138KV MEMORIAL - TENNESSEE TAP 138KV	1183 1200	Rating 308 MVA. And, OKGE Planned Project to Build 138 kV line from Piedmont to Haymaker by 12/30/04.	
0431	ONGL	ONGL	REWINGTON FARK - STONEWALE 130KV	191	13.3	102.7	4.4	WEWORIAL - TENNESSEE TAP 130KV	1200	invalid Contingency	
04SH	OKGE	OKGE	ARCADIA - REDBUD 345KV CKT 2	1195	25.2	112.0	86.4	ARCADIA - REDBUD 345KV CKT 1	1032	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
04SH	OKGE	OKGE	ARCADIA - REDBUD 345KV CKT 1	1195	25.2	111.8	86.3	ARCADIA - REDBUD 345KV CKT 2	1035	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
04SH	OKGE	OKGE	MEMORIAL - SKYLINE 138KV	287	70.8	101.9	7.4	DANFORTH - OMPA-EDMOND HAFER 138KV	1102	See Previous Solution Specified for Facility	
04SH	OKGE	OKGE	ARCADIA - KAMO MEMORIAL 138KV	287	40.8	101.7	14.6	ARCADIA - NORTHWEST 345KV	1161	OKGE Terminal Equipment Project underway to increase line rating. Estimated In-Service Date 9/30/2004. New Emergeny Rating 308 MVA. Relieved or Impact Removed by Selected Upgrades for 1200 MW OKGE Terminal Equipment Project underway to increase line	
04SH	OKGE	OKGE	ARCADIA - KAMO MEMORIAL 138KV	287	51.8	100.7	11.7	ARCADIA - DANFORTH 138KV	1180	rating. Estimated In-Service Date 9/30/2004. New Emergeny Rating 308 MVA. Relieved or Impact Removed by Selected Upgrades for 1200 MW	
04FA	OKGE	OKGE	ARCADIA - REDBUD 345KV CKT 2	1195	16.6	103.2	86.1	ARCADIA - REDBUD 345KV CKT 1	1156	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
04FA	OKGE	OKGE	ARCADIA - REDBUD 345KV CKT 1	1195	16.6	102.9	86.0	ARCADIA - REDBUD 345KV CKT 2	1159	Relieved or Impact Removed by Selected Upgrades for 1200 MW OKGE Terminal Equipment Project underway to increase line	
04WP	OKGE	OKGE	EASTERN AVE - MEMORIAL 138KV	191	61.9	107.4	7.2	MEMORIAL - SKYLINE 138KV	1033	rating. Estimated In-Service Date 12/30/2004. New Emergency Rating 287 MVA	
04WP	OKGE	OKGE	ARCADIA - REDBUD 345KV CKT 2	1195	18.2	105.0	86.5	ARCADIA - REDBUD 345KV CKT 1	1131	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
04WP	OKGE	OKGE	ARCADIA - REDBUD 345KV CKT 1	1195	18.2	104.8	86.3	ARCADIA - REDBUD 345KV CKT 2	1134	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
05AP			NONE IDENTIFIED				0.0		1200		
05G	OKGE	OKGE	ARCADIA - REDBUD 345KV CKT 2	1195	26.4	112.3	85.5	ARCADIA - REDBUD 345KV CKT 1	1005	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
05G	OKGE	OKGE	ARCADIA - REDBUD 345KV CKT 1	1195	26.3	112.0	85.4	ARCADIA - REDBUD 345KV CKT 2	1009	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
05G	OKGE	OKGE	EASTERN AVE - MEMORIAL 138KV	191	38.9	104.6	10.5	MEMORIAL - SKYLINE 138KV	1054	See Previous Solution Specified for Facility	
05G	OKGE	OKGE	ARCADIA - KAMO MEMORIAL 138KV	287	14.5	102.3	21.0	ARCADIA - NORTHWEST 345KV	1149	OKGE Lerminal Equipment Project underway to increase line rating. Estimated In-Service Date 9/30/2004. New Emergeny Rating 308 MVA. Relieved or Impact Removed by Selected Upgrades for 1200 MW	
05G	OKGE	OKGE	ARCADIA - KAMO MEMORIAL 138KV	287	24.1	100.4	18.2	ARCADIA - DANFORTH 138KV	1188	OKGE erminal Equipment Project underway to increase line rating. Estimated In-Service Date 9/30/2004. New Emergeny Rating 308 MVA. Relieved or Impact Removed by Selected Upgrades for 1200 MW	_
05SP	OKGE	OKGE	NORTHWEST 345/138KV TRANSFORMER CKT 1	493	80.0	111.0	12.7	NORTHWEST 345/138KV TRANSFORMER CKT 2	705	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
05SP	OKGE		POOST ROAD - SE15TH 138KV	191	58.1	102.9	7.1	POOST ROAD - TINKER #5 138KV	723	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
05SP 05SP	OKGE	OKGE OKGE	NORTHWEST 345/138KV TRANSFORMER CKT 1 CIMARRON - CZECH HALL 138KV	493 382	78.4 74.9	107.7 110.0	12.0 11.2	NORTHWEST 345/138KV TRANSFORMER CKT 2 MCCLAIN - PLEASANT VALLEY 138KV	791 858	Relieved or Impact Removed by Selected Upgrades for 1200 MW See Previous Solution Specified for Facility	

Study	From			Rate	BC %	TC %			ATC		Estimated
Case	Area	To Area	Monitored Branch Overload	<mva></mva>	Loading	Loading	%TDF	Outaged Branch Causing Overload	(MW)	Solution	Cost
05SP	OKGE	OKGE	DIVISION AVE - HAYMAKER 138KV	287	74.4	106.6	7.7	CIMARRON - CZECH HALL 138KV	871	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
05SP		OKGE	ARCADIA - KAMO MEMORIAL 138KV	287	28.0	109.3	19.4	ARCADIA - DANFORTH 138KV	926	OKGE Terminal Equipment Project underway to increase line rating. Estimated In-Service Date 9/30/2004. New Emergeny Rating 308 MVA. Relieved or Impact Removed by Selected Upgrades for 1200 MW	
05SP	OKGE	OKGE	ARCADIA 345/138KV TRANSFORMER CKT 1	493	49.7	107.7	23.9	ARCADIA 345/138KV TRANSFORMER CKT 2	941	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
05SP	OKGE	OKGE	DIVISION AVE - HAYMAKER 138KV	287	70.1	101.9	7.6	CZECH HALL - XEROX 138KV	956	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
05SP	OKGE	OKGE	NORTHWEST 345/138KV TRANSFORMER CKT 2	493	73.2	101.7	11.7	NORTHWEST 345/138KV TRANSFORMER CKT 1	990	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
05SP	OKGE	OKGE	ARCADIA - KAMO MEMORIAL 138KV	287	15.4	108.0	22.2	ARCADIA - NORTHWEST 345KV	999	OKGE Terminal Equipment Project underway to increase line rating. Estimated In-Service Date 9/30/2004. New Emergeny Rating 308 MVA. Relieved or Impact Removed by Selected Upgrades for 1200 MW	
05SP	OKGE	OKGE	ARCADIA 345/138KV TRANSFORMER CKT 2	493	48.4	105.0	23.3	ARCADIA 345/138KV TRANSFORMER CKT 1	1002	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
05SP	OKGE	OKGE	ARCADIA 345/138KV TRANSFORMER CKT 1	493	48.8	104.4	22.8	ARCADIA 345/138KV TRANSFORMER CKT 2	1024	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
05SP	OKGE	OKGE	ARCADIA - REDBUD 345KV CKT 2	1195	19.1	107.2	87.8	ARCADIA - REDBUD 345KV CKT 1	1099	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
05SP	OKGE	OKGE	ARCADIA - REDBUD 345KV CKT 1	1195	19.0	107.0	87.6	ARCADIA - REDBUD 345KV CKT 2	1102	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
05SP	OKGE	OKGE	ARCADIA 345/138KV TRANSFORMER CKT 2	493	47.6	101.7	22.2	ARCADIA 345/138KV TRANSFORMER CKT 1 Multiple Contingency Outage:	1131	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
								84TH ST - TENNESSEE TAP 138KV MEMORIAL - TENNESSEE TAP 138KV			
05SP	OKGE	OKGE	REMNGTON PARK - STONEWALL 138KV	191	71.2	100.6	4.7	TENNESSEE - TENNESSEE TAP 138KV	1165	See Previous Solution Specified for Facility Not a valid Overload; Relays trip to open UG transmission line	
05SP	OKGE	OKGE	TINKER #2 - TINKER #4 138KV	100	60.7	130.8	5.8	POOST ROAD - SE15TH 138KV	1200	when loading reaches 100%, No problem exist with line open.	
05SH	OKGE	OKGE	ARCADIA - REDBUD 345KV CKT 2	1195	24.0	110.8	86.4	ARCADIA - REDBUD 345KV CKT 1	1049	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
05SH	OKGE	OKGE	ARCADIA - REDBUD 345KV CKT 1	1195	23.9	110.5	86.3	ARCADIA - REDBUD 345KV CKT 2	1052		
05SH	OKGE	OKGE	ARCADIA - KAMO MEMORIAL 138KV	287	53.8	102.9	11.8	ARCADIA - DANFORTH 138KV	1119	OKGE Terminal Equipment Project underway to increase line rating. Estimated In-Service Date 9/30/2004. New Emergeny Rating 308 MVA. Relieved or Impact Removed by Selected Upgrades for 1200 MW	
05SH	OKGE	OKGE	ARCADIA - KAMO MEMORIAL 138KV	287	42.2	103.3	14.6	ARCADIA - NORTHWEST 345KV	1129	OKGE Terminal Equipment Project underway to increase line rating. Estimated In-Service Date 9/30/2004. New Emergeny Rating 308 MVA. Relieved or Impact Removed by Selected Upgrades for 1200 MW	
05FA	OKGE	OKGE	ARCADIA - REDBUD 345KV CKT 2	1195	14.3	101.2	86.5	ARCADIA - REDBUD 345KV CKT 1	1183	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
05FA	OKGE	OKGE	ARCADIA - REDBUD 345KV CKT 1	1195	14.3	101.0	86.4	ARCADIA - REDBUD 345KV CKT 2	1186	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
05WP	OKGE	OKGE	ARCADIA - REDBUD 345KV CKT 2	1195	23.4	109.8	86.1	ARCADIA - REDBUD 345KV CKT 1	1065	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
05WP	OKGE	OKGE	ARCADIA - REDBUD 345KV CKT 1	1195	23.3	109.6	85.9	ARCADIA - REDBUD 345KV CKT 2	1067	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
07SP	OKGE	OKGE	NORTHWEST 345/138KV TRANSFORMER CKT 1	493	82.1	116.2	14.0	NORTHWEST 345/138KV TRANSFORMER CKT 2	636	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
07SP	OKGE	OKGE	NORTHWEST 345/138KV TRANSFORMER CKT 1	493	80.4	112.4	13.1	NORTHWEST 345/138KV TRANSFORMER CKT 2	718	Relieved or Impact Removed by Selected Upgrades for 1200 MW	

Study	From			Rate	BC %	TC %			ATC		Estimated
Case	Area	To Area	Monitored Branch Overload	<mva></mva>	Loading	Loading	%TDF	Outaged Branch Causing Overload	(MW)	Solution	Cost
07SP	OKGE	OKGE	DIVISION AVE - HAYMAKER 138KV	287	75.9	113.8	9.1	CIMARRON - CZECH HALL 138KV	860	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
07SP	OKGE	OKGE	CIMARRON - CZECH HALL 138KV	382	75.1	115.4	12.8	MCCLAIN - PLEASANT VALLEY 138KV	882	See Previous Solution Specified for Facility	
										OKGE Terminal Equipment Project underway to increase line	
										rating. Estimated In-Service Date 9/30/2004. New Emergeny	
07SP	OVCE	OKGE	ADCADIA KAMO MEMODIAI 420KV	287	27.0	113.9	20.8	ARCADIA - DANFORTH 138KV	890	Rating 308 MVA. Relieved or Impact Removed by Selected Upgrades for 1200 MW	
0/35	ONGE	ONGE	ARCADIA - KAMO MEMORIAL 138KV	201	27.0	113.9	20.6	ARCADIA - DANFORTH 138RV	690	opgrades for 1200 MW	
07SP	OKGE	OKGE	ARCADIA 345/138KV TRANSFORMER CKT 1	493	50.5	112.2	25.3	ARCADIA 345/138KV TRANSFORMER CKT 2	898	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
07SP	OKGE	OKGE	NORTHWEST 345/138KV TRANSFORMER CKT 2	493	75.1	106.5	12.9	NORTHWEST 345/138KV TRANSFORMER CKT 1	921	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
07SP	OKGE	OKGE	DIVISION AVE - HAYMAKER 138KV	287	71.3	108.7	9.0	CZECH HALL - XEROX 138KV	948	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
07SP	OKGE	OKGE	ARCADIA 345/138KV TRANSFORMER CKT 2	493	49.2	109.4	24.7	ARCADIA 345/138KV TRANSFORMER CKT 1	952	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
07SP	OKGE	OKGE	ARCADIA 345/138KV TRANSFORMER CKT 1	493	49.7	108.3	24.1	ARCADIA 345/138KV TRANSFORMER CKT 2	960	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
										OKGE Terminal Equipment Project underway to increase line	
										rating. Estimated In-Service Date 9/30/2004. New Emergeny	
0700	OKOE	OKOE	ADOADIA IKANO MEMODIAI 400KU	007	40.0	444.4	00.4	ADOADIA NODTINATOT GASKA	070	Rating 308 MVA. Relieved or Impact Removed by Selected	
07SP	OKGE	OKGE	ARCADIA - KAMO MEMORIAL 138KV	287	13.6	111.4	23.4	ARCADIA - NORTHWEST 345KV	972	Upgrades for 1200 MW	
07SP	OKGE	OKGE	DIVISION AVE - HAYMAKER 138KV	287	69.2	106.3	8.9	MORGAN - XEROX 138KV	989	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
								Multiple Contingency Outage:			
								84TH ST - TENNESSEE TAP 138KV			
07SP	OKGE	OKGE	REMNGTON PARK - STONEWALL 138KV	191	75.0	108.2	5.3	MEMORIAL - TENNESSEE TAP 138KV TENNESSEE - TENNESSEE TAP 138KV	1015	See Previous Solution Specified for Facility	
0/35	ONGE	ONGE	REWINGTON PARK - STONEWALL 136RV	191	75.0	100.2	5.5	TENNESSEE TENNESSEE TAF TSONV	1013	Gee Frevious Solution Specified for Facility	
07SP	OKGE	OKGE	DIVISION AVE - HAYMAKER 138KV	287	67.9	105.0	8.9	MORGAN - MUSTANG 138KV	1025	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
07SP	OKGE	OKGE	NORTHWEST 345/138KV TRANSFORMER CKT 2	493	73.6	102.9	12.0	NORTHWEST 345/138KV TRANSFORMER CKT 1	1025	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
07SP	OKGE	OKGE	ARCADIA 345/138KV TRANSFORMER CKT 2	493	48.4	105.5	23.5	ARCADIA 345/138KV TRANSFORMER CKT 1	1028	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
07SP	OKGE	OKGE	CIMARRON - CZECH HALL 138KV	382	65.0	105.7	13.0	CIMARRON - HAYMAKER 138KV	1044	See Previous Solution Specified for Facility	
07SP	OKGE OKGE	OKGE OKGE	LONEOAK - QUAIL CREEK 138KV CIMARRON - CZECH HALL 138KV	308 382	67.3 63.0	103.7 105.7	9.3 13.6	NORTHWEST - PANTHER 138KV DIVISION AVE - HAYMAKER 138KV	1050	Relieved or Impact Removed by Selected Upgrades for 1200 MW See Previous Solution Specified for Facility	
0/5P	UNGE	UNGE	CIIVIARRON - CZECH HALL 136KV	362	63.0	105.7	13.0	DIVISION AVE - HATWAKER 136KV	1056	See Previous Solution Specified for Facility	
07SP	OKGE	OKGE	CZECH HALL - XEROX 138KV	382	65.0	104.7	12.6	MCCLAIN - PLEASANT VALLEY 138KV	1072	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
	2112	21/25									
07SP	OKGE	OKGE	LONEOAK - QUAIL CREEK 138KV	308	66.6	102.9	9.3	PANTHER - SILVER LAKE 138KV	1081	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
07SP	OKGE	OKGE	ARCADIA - REDBUD 345KV CKT 2	1195	17.5	106.1	88.2	ARCADIA - REDBUD 345KV CKT 1	1118	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
07SP	OKGE	OKGE	ARCADIA - REDBUD 345KV CKT 1	1195	17.4	105.8	88.0	ARCADIA - REDBUD 345KV CKT 2	1121	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
07SP	OKGE	OKGE	HORSESHOE LAKE - KAMO MEMORIAL 138KV	287	14.1	102.1	21.0	ARCADIA - DANFORTH 138KV	1146	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
07SP	OKGE	OKGE	CIMARRON - CZECH HALL 138KV	382	53.6	102.1	15.6	DIVISION AVE - MUSTANG 138KV	1148	See Previous Solution Specified for Facility	
07SP	OKGE	OKGE	PLEASANT VALLEY - SOUTHGATE 138KV	287	79.1	100.2	5.0	HOLLYWOOD - INDIAN HILLS 138KV	1188	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
07SP	OKGE	OKGE	CIMARRON - CZECH HALL 138KV	382	59.4	100.1	13.0	PLEASANT VALLEY - SOUTHGATE 138KV	1197	See Previous Solution Specified for Facility	
07SP	OKGE OKGE	OKGE OKGE	DIVISION AVE - LAKESIDE 138KV REMNGTON PARK - STONEWALL 138KV	287 191	85.3 74.6	101.4 107.0	3.8 5.2	MEMORIAL - TENNESSEE TAP 138KV MEMORIAL - TENNESSEE TAP 138KV	1200 1200	Invalid Contingency Invalid Contingency	
0/32	ONGE	ONGE	ILLIVING FOIN FAIRE - STONEWALL ISON	191	74.0	107.0	J.Z	WILWORIAL - ILININESSEE TAF ISONV	1200	invalid Contingency	
07WP	OKGE	OKGE	ARCADIA - REDBUD 345KV CKT 2	1195	20.6	108.1	87.1	ARCADIA - REDBUD 345KV CKT 1	1088	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
0714/5	OKCE	OKCE	ADCADIA DEDDUD MENVOCITA	1105	20.0	107.0	00.0	ADCADIA DEDDUD MENU OVER	1001	Policy and or Impact Removed by Colorted Ungrades for 1200 MW	
07WP	OKGE	OKGE	ARCADIA - REDBUD 345KV CKT 1	1195	20.6	107.8	86.9	ARCADIA - REDBUD 345KV CKT 2	1091	Relieved or Impact Removed by Selected Upgrades for 1200 MW	

Study Case	From Area	To Area	Monitored Branch Overload	Rate <mva></mva>	BC % Loading	TC % Loading	%TDF	Outaged Branch Causing Overload	ATC (MW)	Solution	Estimated Cost
10SP	OKGE	OKGE	NORTHWEST 345/138KV TRANSFORMER CKT 1	493	84.4	118.4	13.9	NORTHWEST 345/138KV TRANSFORMER CKT 2	631	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
10SP	OKGE	OKGE	NORTHWEST 345/138KV TRANSFORMER CKT 1	493	82.6	114.7	13.2	NORTHWEST 345/138KV TRANSFORMER CKT 2	704	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
10SP	OKGE	OKGE	POOST ROAD - SE15TH 138KV	191	53.8	119.4	10.4	POOST ROAD - TINKER #5 138KV	758	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
10SP	OKGE	OKGE	ARCADIA 345/138KV TRANSFORMER CKT 1	493	51.4	114.5	26.0	ARCADIA 345/138KV TRANSFORMER CKT 2	901	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
10SP	OKGE	OKGE	NORTHWEST 345/138KV TRANSFORMER CKT 2	493	77.3	108.5	12.8	NORTHWEST 345/138KV TRANSFORMER CKT 1	919	Relieved or Impact Removed by Selected Upgrades for 1200 MW OKGE Terminal Equipment Project underway to increase line	
10SP	OKGE	OKGE	ARCADIA - KAMO MEMORIAL 138KV	287	25.7	114.3	21.2	ARCADIA - DANFORTH 138KV	942	rating. Estimated In-Service Date 9/30/2004. New Emergeny Rating 308 MVA. Relieved or Impact Removed by Selected Upgrades for 1200 MW	
10SP	OKGE	OKGE	ARCADIA 345/138KV TRANSFORMER CKT 2	493	50.1	111.7	25.3	ARCADIA 345/138KV TRANSFORMER CKT 1	945	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
10SP	OKGE	OKGE	POOST ROAD - SE15TH 138KV	191	65.3	106.6	6.6	TINKER #2 - TINKER #5 138KV	948	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
10SP	OKGE	OKGE	ARCADIA 345/138KV TRANSFORMER CKT 1	493	50.5	110.7	24.7	ARCADIA 345/138KV TRANSFORMER CKT 2	954	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
10SP	OKGE	OKGE	ARCADIA 345/138KV TRANSFORMER CKT 2	493	49.2	107.8	24.1	ARCADIA 345/138KV TRANSFORMER CKT 1	1005	Relieved or Impact Removed by Selected Upgrades for 1200 MW OKGE Terminal Equipment Project underway to increase line	
10SP	OKGE	OKGE	ARCADIA - KAMO MEMORIAL 138KV	287	10.4	110.4	23.9	ARCADIA - NORTHWEST 345KV	1010	rating. Estimated In-Service Date 9/30/2004. New Emergeny Rating 308 MVA. Relieved or Impact Removed by Selected Upgrades for 1200 MW	
10SP	OKGE	OKGE	DIVISION AVE - HAYMAKER 138KV	287	74.6	110.5	8.6	CIMARRON - CZECH HALL 138KV	1019	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
10SP	OKGE OKGE		NORTHWEST 345/138KV TRANSFORMER CKT 2 CIMARRON - CZECH HALL 138KV	493 382	75.7 73.3	105.0 111.6	12.1 12.2	NORTHWEST 345/138KV TRANSFORMER CKT 1 MCCLAIN - PLEASANT VALLEY 138KV	1030	Relieved or Impact Removed by Selected Upgrades for 1200 MW See Previous Solution Specified for Facility	
10SP	OKGE	OKGE	DIVISION AVE - HAYMAKER 138KV	287	69.7	105.3	8.5	CZECH HALL - XEROX 138KV	1108	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
10SP	OKGE	OKGE	LONEOAK - QUAIL CREEK 138KV	308	66.5	102.2	9.2	NORTHWEST - PANTHER 138KV	1138	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
10SP	OKGE	OKGE	DIVISION AVE - HAYMAKER 138KV	287	67.5	102.8	8.5	MORGAN - XEROX 138KV	1151	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
10SP	OKGE	OKGE	LONEOAK - QUAIL CREEK 138KV	308	65.7	101.4	9.2	PANTHER - SILVER LAKE 138KV	1161	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
10SP	OKGE OKGE	OKGE OKGE	DIVISION AVE - HAYMAKER 138KV CIMARRON - CZECH HALL 138KV	287 382	66.2 63.3	101.5 101.8	8.4 12.3	MORGAN - MUSTANG 138KV CIMARRON - HAYMAKER 138KV	1174 1176	Relieved or Impact Removed by Selected Upgrades for 1200 MW See Previous Solution Specified for Facility	
10SP	OKGE	OKGE	ARCADIA - REDBUD 345KV CKT 2	1195	13.3	101.7	88.0	ARCADIA - REDBUD 345KV CKT 1	1177	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
10SP	OKGE OKGE	OKGE OKGE	ARCADIA - REDBUD 345KV CKT 1 CIMARRON - CZECH HALL 138KV	1195 382	13.2 61.0	101.5 101.3	87.9 12.8	ARCADIA - REDBUD 345KV CKT 2 DIVISION AVE - HAYMAKER 138KV	1180 1182	Relieved or Impact Removed by Selected Upgrades for 1200 MW See Previous Solution Specified for Facility	
10SP	OKGE	OKGE	HORSESHOE LAKE - KAMO MEMORIAL 138KV	287	10.9	100.5	21.4	ARCADIA - DANFORTH 138KV	1188	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
10SP	OKGE	OKGE	CZECH HALL - XEROX 138KV	382	62.6	100.5	12.1	MCCLAIN - PLEASANT VALLEY 138KV	1193	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
10SP	OKGE	OKGE	MAUD - SEMINOLE 138KV CKT 2	287	76.6	101.1	5.9	MAUD - SEMINOLE 138KV CKT 1	1198	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
10SP	OKGE	OKGE	TINKER #2 - TINKER #4 138KV	100	95.7	153.4	4.8	POOST ROAD - SE15TH 138KV	1200	Not a valid Overload; Relays trip to open UG transmission line when loading reaches 100%, No problem exist with line open.	
10WP	OKGE	OKGE	ARCADIA - REDBUD 345KV CKT 2	1195	20.4	105.7	84.9	ARCADIA - REDBUD 345KV CKT 1	1121	Relieved or Impact Removed by Selected Upgrades for 1200 MW	

SPP-2003-271-2
Table 1.1 - SPP Facility Overloads Caused or Impacted by 1200 MW Transfer using Scenario 1

Study	From			Rate	BC %	TC %			ATC		Estimated
Case	Area	To Area	Monitored Branch Overload	<mva></mva>	Loading	Loading	%TDF	Outaged Branch Causing Overload	(MW)	Solution	Cost
10WP	OKGE	OKGE	ARCADIA - REDBUD 345KV CKT 1	1195	20.4	105.4	84.7	ARCADIA - REDBUD 345KV CKT 2	1124	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
										OKGE Terminal Equipment Project underway to increase line	
										rating. Estimated In-Service Date 9/30/2004. New Emergeny	
										Rating 308 MVA. Relieved or Impact Removed by Selected	
10WP	OKGE	OKGE	ARCADIA - KAMO MEMORIAL 138KV	287	29.5	100.7	17.0	ARCADIA - NORTHWEST 345KV	1184	Upgrades for 1200 MW	
										Total Estimated Engineering and Construction Cost	\$ 24.200.000

Study	1		BC Voltage	TC Voltage		ATC		Estimated
Case	AREA	Monitored Bus with Violation	(PU)	(PU)	Outaged Branch Causing Voltage Violation	(MW)	Solution	Cost
Case	AREA	WOTHLOTED BUS WITH VIOLATION	(FU)	(FU)	Outaged Branch Causing Voltage Violation	(IVIVV)		Cost
0.400	OKGE	54951 LITTLAX269.0	0.9267	0.8992	OPEN LINE FROM BUS 55004 [ROSEDAL269.000] TO BUS 55005 [SPRHILT269.000] CKT 1	1200	Close normally open switch between bus 54996 &	
04SP			0.9267	0.8992			bus 55052 by scada for mitigation.	
04SP	OKGE	54956 MACOCTP269.0			OPEN LINE FROM BUS 55004 [ROSEDAL269.000] TO BUS 55005 [SPRHILT269.000] CKT 1	1200		
04SP	OKGE	54995 SPRNGHL269.0	0.9042	0.8760	OPEN LINE FROM BUS 55004 [ROSEDAL269.000] TO BUS 55005 [SPRHILT269.000] CKT 1	1200		
04SP	OKGE	54996 ETOWAH 269.0	0.9115	0.8835	OPEN LINE FROM BUS 55004 [ROSEDAL269.000] TO BUS 55005 [SPRHILT269.000] CKT 1	1200	"	
04SP	OKGE	55001 MACOMOC269.0	0.9214	0.8938	OPEN LINE FROM BUS 55004 [ROSEDAL269.000] TO BUS 55005 [SPRHILT269.000] CKT 1	1200	"	
04SP	OKGE	55005 SPRHILT269.0	0.9051	0.8769	OPEN LINE FROM BUS 55004 [ROSEDAL269.000] TO BUS 55005 [SPRHILT269.000] CKT 1	1200	"	
04SP	OMPA	56185 OMLXNTN169.0	0.9042	0.8759	OPEN LINE FROM BUS 55004 [ROSEDAL269.000] TO BUS 55005 [SPRHILT269.000] CKT 1	1200	"	
							Close normally open switch between bus 54996 &	
04SP	OKGE	54951 LITTLAX269.0	0.9232	0.8950	OPEN LINE FROM BUS 55004 [ROSEDAL269.000] TO BUS 55099 [PAOLI 269.000] CKT 1	1200	bus 55052 by scada for mitigation.	
04SP	OKGE	54956 MACOCTP269.0	0.9200	0.8916	OPEN LINE FROM BUS 55004 [ROSEDAL269.000] TO BUS 55099 [PAOLI 269.000] CKT 1	1200	"	
04SP	OKGE	54995 SPRNGHL269.0	0.8985	0.8694	OPEN LINE FROM BUS 55004 [ROSEDAL269.000] TO BUS 55099 [PAOLI 269.000] CKT 1	1200	"	
04SP	OKGE	54996 ETOWAH 269.0	0.9070	0.8782	OPEN LINE FROM BUS 55004 [ROSEDAL269.000] TO BUS 55099 [PAOLI 269.000] CKT 1	1200	II .	
04SP	OKGE	55001 MACOMOC269.0	0.9177	0.8893	OPEN LINE FROM BUS 55004 [ROSEDAL269.000] TO BUS 55099 [PAOLI 269.000] CKT 1	1200	"	
04SP	OKGE	55004 ROSEDAL269.0	0.8982	0.8691	OPEN LINE FROM BUS 55004 (ROSEDAL269.000) TO BUS 55099 (PAOLI 269.000) CKT 1	1200	"	
04SP	OKGE	55005 SPRHILT269.0	0.8994	0.8703	OPEN LINE FROM BUS 55004 [ROSEDAL269.000] TO BUS 55099 [PAOLI 269.000] CKT 1	1200	"	
04SP	OMPA	56185 OMLXNTN169.0	0.8985	0.8694	OPEN LINE FROM BUS 55004 [ROSEDAL269.000] TO BUS 55099 [PAOLI 269.000] CKT 1	1200	· ·	
04SH	JIVII A	NONE IDENTIFIED	0.0303	0.0004	G. E. F. E. F. F. Main 200 30004 [FOOLDAL200:000] TO 200 30003 [FAOLI 200:000] CKT 1	1200		
045H		NONE IDENTIFIED				1200		
04FA		NONE IDENTIFIED				1200		
		_						
05AP		NONE IDENTIFIED				1200		
05G		NONE IDENTIFIED				1200		
							Close normally open switch between bus 54996 &	
05SP	OKGE	54951 LITTLAX269.0	0.9240	0.8948	OPEN LINE FROM BUS 55004 [ROSEDAL269.000] TO BUS 55005 [SPRHILT269.000] CKT 1	1200	bus 55052 by scada for mitigation.	
05SP	OKGE	54956 MACOCTP269.0	0.9208	0.8915	OPEN LINE FROM BUS 55004 [ROSEDAL269.000] TO BUS 55005 [SPRHILT269.000] CKT 1	1200	"	
05SP	OKGE	54995 SPRNGHL269.0	0.9005	0.8704	OPEN LINE FROM BUS 55004 [ROSEDAL269.000] TO BUS 55005 [SPRHILT269.000] CKT 1	1200	"	
05SP	OKGE	54996 ETOWAH 269.0	0.9082	0.8784	OPEN LINE FROM BUS 55004 [ROSEDAL269.000] TO BUS 55005 [SPRHILT269.000] CKT 1	1200	ıı .	
05SP	OKGE	55001 MACOMOC269.0	0.9185	0.8891	OPEN LINE FROM BUS 55004 [ROSEDAL269.000] TO BUS 55005 [SPRHILT269.000] CKT 1	1200	"	
05SP	OKGE	55005 SPRHILT269.0	0.9014	0.8714	OPEN LINE FROM BUS 55004 [ROSEDAL269.000] TO BUS 55005 [SPRHILT269.000] CKT 1	1200	"	
05SP	OMPA	56185 OMLXNTN169.0	0.9005	0.8704	OPEN LINE FROM BUS 55004 [ROSEDAL269.000] TO BUS 55005 [SPRHILT269.000] CKT 1	1200	"	
							Close normally open switch between bus 54996 &	
05SP	OKGE	54951 LITTLAX269.0	0.9203	0.8903	OPEN LINE FROM BUS 55004 [ROSEDAL269.000] TO BUS 55099 [PAOLI 269.000] CKT 1	1200	bus 55052 by scada for mitigation.	
05SP	OKGE	54956 MACOCTP269.0	0.9170	0.8868	OPEN LINE FROM BUS 55004 [ROSEDAL269.000] TO BUS 55099 [PAOLI 269.000] CKT 1	1200	"	
05SP	OKGE	54995 SPRNGHL269.0	0.8945	0.8635	OPEN LINE FROM BUS 55004 ROSEDAL269.0001 TO BUS 55099 PAOLI 269.0001 CKT 1	1200	"	
05SP	OKGE	54996 ETOWAH 269.0	0.9035	0.8728	OPEN LINE FROM BUS 55004 [ROSEDAL269.000] TO BUS 55099 [PAOLI 269.000] CKT 1	1200	"	
05SP	OKGE	55001 MACOMOC269.0	0.9147	0.8844	OPEN LINE FROM BUS 55004 [ROSEDAL269.000] TO BUS 55099 [PAOLI 269.000] CKT 1	1200	"	
05SP	OKGE	55004 ROSEDAL269.0	0.8943	0.8632	OPEN LINE FROM BUS 55004 [ROSEDAL269.000] TO BUS 55099 [PAOLI 269.000] CKT 1	1200	"	
05SP	OKGE	55005 SPRHILT269.0	0.8955	0.8644	OPEN LINE FROM BUS 55004 [ROSEDAL269.000] TO BUS 55099 [PAOLI 269.000] CKT 1	1200	"	
05SP	OMPA	56185 OMLXNTN169.0	0.8945	0.8635	OPEN LINE FROM BUS 55004 [ROSEDAL269.000] TO BUS 55099 [PAOLI 269.000] CKT 1	1200	"	
05SH	OWFA	NONE IDENTIFIED	0.0545	0.0055	OF EIN EINE I NOW BOS 33004 [NOSEDALZ09:000] TO BOS 33004 [NOSE Z09:000] CNT T	1200		
055H		NONE IDENTIFIED				1200		
05WP		NONE IDENTIFIED				1200	Deliana des Impact Demonad hu Calantail	
	01/05	5 4000 NEOCTH 005 -					Relieved or Impact Removed by Selected	
07SP	OKGE	54969 NE30TH 269.0	0.9372	0.8969	OPEN LINE FROM BUS 54969 [NE30TH 269.000] TO BUS 54972 [RENO 269.000] CKT 1	1108	Upgrades for 1200 MW	
						1	Close normally open switch between bus 54996 &	
07SP	OKGE	54996 ETOWAH 269.0	0.9268	0.8921	OPEN LINE FROM BUS 54996 [ETOWAH 269.000] TO BUS 55005 [SPRHILT269.000] CKT 1	1200	bus 55052 by scada for mitigation.	
07SP	OKGE	55001 MACOMOC269.0	0.9333	0.8989	OPEN LINE FROM BUS 54996 [ETOWAH 269.000] TO BUS 55005 [SPRHILT269.000] CKT 1	1200	"	
							Close normally open switch between bus 54996 &	
07SP	OKGE	54951 LITTLAX269.0	0.9205	0.8818	OPEN LINE FROM BUS 55004 [ROSEDAL269.000] TO BUS 55005 [SPRHILT269.000] CKT 1	1200	bus 55052 by scada for mitigation.	
07SP	OKGE	54956 MACOCTP269.0	0.9172	0.8783	OPEN LINE FROM BUS 55004 [ROSEDAL269.000] TO BUS 55005 [SPRHILT269.000] CKT 1	1200		
07SP	OKGE	54995 SPRNGHL269.0	0.8966	0.8567	OPEN LINE FROM BUS 55004 ROSEDAL269.000 TO BUS 55005 SPRHILT269.000 CKT 1	1200	п	
07SP	OKGE	54996 ETOWAH 269.0	0.9042	0.8646	OPEN LINE FROM BUS 55004 [ROSEDAL269.000] TO BUS 55005 [SPRHILT269.000] CKT 1	1200	"	
07SP	OKGE	55001 MACOMOC269.0	0.9148	0.8758	OPEN LINE FROM BUS 55004 [ROSEDAL269.000] TO BUS 55005 [SPRHILT269.000] CKT 1	1200	"	
07SP	OKGE	55005 SPRHILT269.0	0.8975	0.8576	OPEN LINE FROM BUS 55004 [ROSEDAL269.000] TO BUS 55005 [SPRHILT269.000] CKT 1	1200	"	
07SP	OMPA	56185 OMLXNTN169.0	0.8966	0.8567	OPEN LINE FROM BUS 55004 [ROSEDAL269.000] TO BUS 55005 [SPRHILT269.000] CKT 1	1200	"	
3.51	J / 1	30.00 02/4114100.0	0.0000	0.0007	2. 2 22 (No 500 0000 [NO.005 N.E.50.000] TO 500 00000 [OF N. 11. 1200.000] ON T	1200	Close normally open switch between bus 54996 &	
07SP	OKGE	54951 LITTLAX269.0	0.9165	0.8766	OPEN LINE FROM BUS 55004 [ROSEDAL269.000] TO BUS 55099 [PAOLI 269.000] CKT 1	1200	bus 55052 by scada for mitigation.	
07SP	OKGE	54956 MACOCTP269.0	0.9100	0.8729	OPEN LINE FROM BUS 55004 [ROSEDAL269.000] TO BUS 55099 [PAOLI 269.000] CKT 1 OPEN LINE FROM BUS 55004 [ROSEDAL269.000] TO BUS 55099 [PAOLI 269.000] CKT 1	1200	"	
0/37	UNGE	37330 WACOCTF 209.0	0.5130	0.0123	OI EN ENTE I NOM DOS 33004 [NOSEDALZOS.000] TO DOS 33033 [FAOLI ZOS.000] CNT T	1200		

Study			BC Voltage	TC Voltage		ATC		Estimated
Case	AREA	Monitored Bus with Violation	(PU)	(PU)	Outaged Branch Causing Voltage Violation	(MW)	Solution	Cost
07SP	OKGE	54991 LTRVRLK269.0	0.9355	0.8966	OPEN LINE FROM BUS 55004 (ROSEDAL269.000) TO BUS 55099 [PAOLI 269.000] CKT 1	1200	"	0000
07SP	OKGE	54995 SPRNGHL269.0	0.8902	0.8489	OPEN LINE FROM BUS 55004 [ROSEDAL269.000] TO BUS 55099 [PAOLI 269.000] CKT 1	1200	"	1
07SP	OKGE	54996 ETOWAH 269.0	0.8991	0.8582	OPEN LINE FROM BUS 55004 [ROSEDAL269.000] TO BUS 55099 [PAOLI 269.000] CKT 1	1200	"	
07SP	OKGE	55001 MACOMOC269.0	0.9106	0.8704	OPEN LINE FROM BUS 55004 [ROSEDAL269.000] TO BUS 55099 [PAOLI 269.000] CKT 1	1200		
07SP	OKGE	55004 ROSEDAL269.0	0.8898	0.8484	OPEN LINE FROM BUS 55004 [ROSEDAL269.000] TO BUS 55099 [PAOLI 269.000] CKT 1	1200	H .	
07SP	OKGE	55005 SPRHILT269.0	0.8911	0.8498	OPEN LINE FROM BUS 55004 [ROSEDAL269.000] TO BUS 55099 [PAOLI 269.000] CKT 1	1200		
07SP	OMPA	56185 OMLXNTN169.0	0.8902	0.8489	OPEN LINE FROM BUS 55004 [ROSEDAL269.000] TO BUS 55099 [PAOLI 269.000] CKT 1	1200	н	
0701	OWI A	30103 CIVIEXIVITIVI03:0	0.0302	0.0403	OF EIN EINE TROWN BOO 33004 [ROOLDALZ05:000] TO BOO 33035 [TAGET 205:000] ORT T	1200	Close normally open switch between bus 54996 &	
07SP	OKGE	54996 ETOWAH 269.0	0.9161	0.8937	OPEN LINE FROM BUS 55099 PAOLI 269.0 TO BUS 55100 PAOLI- 4 138 TO BUS 55746 PAOLI 113.8 CKT1	1200	bus 55052 by scada for mitigation.	
07WP	ONGL	NONE IDENTIFIED	0.3101	0.0337	OF EN EINE FROM BGG 350331 AGEF 205:0 FG BGG 35100 FAGEF 4 150 FG BGG 35140 FAGEF 115.0 GKT1	1200	bus 33032 by scada for miligation.	ł
10SP	OKGE	54738 KOCH 269.0	0.8962	0.8694	OPEN LINE FROM BUS 54738 [KOCH 269.000] TO BUS 54739 [MEDFORD269.000] CKT 1	896	Look at installing 69kV caps at Koch.	\$ 300,000
1035	ONGL	34736 ROCH 209.0	0.0902	0.0094	OF EN LINE 1 NOW BOS 34736 [NOCH 209:000] TO BOS 34736 [MEDI OND208:000] ON 1	090	Relieved or Impact Removed by Selected	\$ 300,000
10SP	OKGE	54719 CLYDE 269.0	0.9137	0.8880	OPEN LINE FROM BUS 54738 [KOCH 269.000] TO BUS 54739 [MEDFORD269.000] CKT 1	934	Upgrades for 1200 MW	
1035	UNGE	547 19 CLTDE 269.0	0.9137	0.0000	OPEN LINE FROM BUS 34736 [ROCH 209:000] TO BUS 34738 [MEDFORD209:000] CKT 1	934	Relieved or Impact Removed by Selected	
4000	OKOE	54969 NE30TH 269.0	0.9327	0.8914	OPEN LINE FROM BUS 54969 [NE30TH 269.000] TO BUS 54972 [RENO 269.000] CKT 1	950		
10SP	OKGE	54969 NE301H 269.0	0.9327	0.8914	OPEN LINE FROM BUS 54969 [NE301H 269.000] TO BUS 54972 [RENO 269.000] CKT 1	950	Upgrades for 1200 MW Relieved or Impact Removed by Selected	
4000	OKOE	54070 DEEDEKT000 0	0.0070	0.0004	OPEN LINE FROM DUO FACCO INFOCTIL COS COST TO DUO FACTO IDENIO. COS COST CITA	4004		
10SP	OKGE	54970 DEEPFKT269.0	0.9373	0.8964	OPEN LINE FROM BUS 54969 [NE30TH 269.000] TO BUS 54972 [RENO 269.000] CKT 1	1094	Upgrades for 1200 MW	
							Relieved or Impact Removed by Selected	
10SP	OKGE	54974 DEEPFRK269.0	0.9380	0.8969	OPEN LINE FROM BUS 54969 [NE30TH 269.000] TO BUS 54972 [RENO 269.000] CKT 1	1109	Upgrades for 1200 MW	
							Close normally open switch between bus 54996 &	
10SP	OKGE	54956 MACOCTP269.0	0.9317	0.8978	OPEN LINE FROM BUS 54996 [ETOWAH 269.000] TO BUS 55005 [SPRHILT269.000] CKT 1	1200	bus 55052 by scada for mitigation.	
10SP	OKGE	54996 ETOWAH 269.0	0.9223	0.8881	OPEN LINE FROM BUS 54996 [ETOWAH 269.000] TO BUS 55005 [SPRHILT269.000] CKT 1	1200	"	
10SP	OKGE	55001 MACOMOC269.0	0.9292	0.8952	OPEN LINE FROM BUS 54996 [ETOWAH 269.000] TO BUS 55005 [SPRHILT269.000] CKT 1	1200		
							Close normally open switch between bus 54996 &	
10SP	OKGE	54951 LITTLAX269.0	0.9148	0.8759	OPEN LINE FROM BUS 55004 [ROSEDAL269.000] TO BUS 55005 [SPRHILT269.000] CKT 1	1200	bus 55052 by scada for mitigation.	
10SP	OKGE	54956 MACOCTP269.0	0.9112	0.8722	OPEN LINE FROM BUS 55004 [ROSEDAL269.000] TO BUS 55005 [SPRHILT269.000] CKT 1	1200		
10SP	OKGE	54991 LTRVRLK269.0	0.9340	0.8962	OPEN LINE FROM BUS 55004 [ROSEDAL269.000] TO BUS 55005 [SPRHILT269.000] CKT 1	1200		
10SP	OKGE	54995 SPRNGHL269.0	0.8889	0.8489	OPEN LINE FROM BUS 55004 [ROSEDAL269.000] TO BUS 55005 [SPRHILT269.000] CKT 1	1200		
10SP	OKGE	54996 ETOWAH 269.0	0.8971	0.8575	OPEN LINE FROM BUS 55004 [ROSEDAL269.000] TO BUS 55005 [SPRHILT269.000] CKT 1	1200		
10SP	OKGE	55001 MACOMOC269.0	0.9086	0.8695	OPEN LINE FROM BUS 55004 [ROSEDAL269.000] TO BUS 55005 [SPRHILT269.000] CKT 1	1200		
10SP	OKGE	55005 SPRHILT269.0	0.8899	0.8499	OPEN LINE FROM BUS 55004 [ROSEDAL269.000] TO BUS 55005 [SPRHILT269.000] CKT 1	1200	=	
10SP	OMPA	56185 OMLXNTN169.0	0.8889	0.8489	OPEN LINE FROM BUS 55004 [ROSEDAL269.000] TO BUS 55005 [SPRHILT269.000] CKT 1	1200		
							Close normally open switch between bus 54996 &	
10SP	OKGE	54951 LITTLAX269.0	0.9104	0.8701	OPEN LINE FROM BUS 55004 [ROSEDAL269.000] TO BUS 55099 [PAOLI 269.000] CKT 1	1200	bus 55052 by scada for mitigation.	
10SP	OKGE	54956 MACOCTP269.0	0.9066	0.8662	OPEN LINE FROM BUS 55004 [ROSEDAL269.000] TO BUS 55099 [PAOLI 269.000] CKT 1	1200	*	
10SP	OKGE	54983 LTRVRTP269.0	0.9350	0.8961	OPEN LINE FROM BUS 55004 [ROSEDAL269.000] TO BUS 55099 [PAOLI 269.000] CKT 1	1200	II .	
10SP	OKGE	54985 TXSTELA269.0	0.9375	0.8987	OPEN LINE FROM BUS 55004 [ROSEDAL269.000] TO BUS 55099 [PAOLI 269.000] CKT 1	1200	"	
10SP	OKGE	54991 LTRVRLK269.0	0.9310	0.8919	OPEN LINE FROM BUS 55004 [ROSEDAL269.000] TO BUS 55099 [PAOLI 269.000] CKT 1	1200		
10SP	OKGE	54995 SPRNGHL269.0	0.8819	0.8401	OPEN LINE FROM BUS 55004 ROSEDAL269.000 TO BUS 55099 PAOLI 269.000 CKT 1	1200	II .	
10SP	OKGE	54996 ETOWAH 269.0	0.8915	0.8503	OPEN LINE FROM BUS 55004 [ROSEDAL269.000] TO BUS 55099 [PAOLI 269.000] CKT 1	1200	II .	
10SP	OKGE	55001 MACOMOC269.0	0.9040	0.8635	OPEN LINE FROM BUS 55004 (ROSEDAL269.000) TO BUS 55099 (PAOLI 269.000) CKT 1	1200	·	
10SP	OKGE	55004 ROSEDAL269.0	0.8814	0.8396	OPEN LINE FROM BUS 55004 (ROSEDAL269.000) TO BUS 55099 (PAOLI 269.000) CKT 1	1200	·	Ì
10SP	OKGE	55005 SPRHILT269.0	0.8828	0.8411	OPEN LINE FROM BUS 55004 [ROSEDAL269.000] TO BUS 55099 [PAOLI 269.000] CKT 1	1200	"	
10SP	OMPA	56185 OMLXNTN169.0	0.8819	0.8401	OPEN LINE FROM BUS 55004 [ROSEDAL269.000] TO BUS 55099 [PAOLI 269.000] CKT 1	1200	"	
10WP	,	NONE IDENTIFIED	2.22.3			1200		
		· · · · · · · · · · · · · · · · · · ·	•				Total Estimated Engineering and Construction	
							Cost	\$ 300,000

SPP-2003-271-2
Table 3.1 - SPP Facility Overloads
Caused or Impacted by Selected Upgrades
for 1200 MW using Scenario 1

					BC Without						
Study	From			Rate	Upgrades	Upgrades	Upgrades	Upgrades			Estimated
Case	Area	To Area	Monitored Branch Overload	<mva></mva>	%Loading	%Loading	%Loading	%Loading	Outaged Branch Causing Overload	Solution	Cost
05AP			NONE IDENTIFIED								
05G			NONE IDENTIFIED								
05SH			NONE IDENTIFIED								
05FA			NONE IDENTIFIED								
07SP			NONE IDENTIFIED								
07WP			NONE IDENTIFIED								
10SP			NONE IDENTIFIED								
10WP			NONE IDENTIFIED								
										Total Estimated Engineering and Construction Cost	\$ -

	ı	T		1	Г	1	1		T .		1
Study	From			Rate	BC %	TC %			ATC		Estimated
Case	Area	To Area	Monitored Branch Overload	<mva></mva>	Loading	Loading	%TDF	Outaged Branch Causing Overload	(MW)	Solution	Cost
04SP	OKGE		DRAPER 345/138KV TRANSFORMER CKT 1	493	86.7	106.2	8.0	DRAPER 345/138KV TRANSFORMER CKT 2	547	See Previous Solution Specified for Facility in Table 1.1	
04SP	OKGE		DRAPER 345/138KV TRANSFORMER CKT 2	493	86.7	106.2	8.0	DRAPER 345/138KV TRANSFORMER CKT 1	547	See Previous Solution Specified for Facility in Table 1.1	
04SP	OKGE	OKGE	MEMORIAL - SKYLINE 138KV	287	64.9	124.5	14.3	DANFORTH - OMPA-EDMOND HAFER 138KV	574	See Previous Solution Specified for Facility in Table 1.1	
04SP	OKGE		MEMORIAL - SKYLINE 138KV	287	59.9	119.4	14.2	EASTERN AVE - OMPA-EDMOND HAFER 138KV	658	See Previous Solution Specified for Facility in Table 1.1	
04SP	OKGE	OKGE	DRAPER 345/138KV TRANSFORMER CKT 1	493	84.4	102.3	7.4	DRAPER 345/138KV TRANSFORMER CKT 2	662	See Previous Solution Specified for Facility in Table 1.1	
04SP	OKGE	OKGE	DRAPER 345/138KV TRANSFORMER CKT 2	493	84.4	102.3	7.4	DRAPER 345/138KV TRANSFORMER CKT 1	662	See Previous Solution Specified for Facility in Table 1.1	
04SP	OKGE	OKGE	NORTHWEST 345/138KV TRANSFORMER CKT 1	493	80.2	108.9	11.8	NORTHWEST 345/138KV TRANSFORMER CKT 2	707	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
										, , , , , , , , , , , , , , , , , , , ,	
04SP	OKGE	OKGE	LONEOAK - QUAIL CREEK 138KV	308	74.5	110.5	9.2	NORTHWEST - PANTHER 138KV	757	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
04SP	OKGE	OKGE	MEMORIAL - SKYLINE 138KV	287	57.8	113.4	13.3	DIVISION AVE - SILVER LAKE 138KV	772	See Previous Solution Specified for Facility in Table 1.1	1
0.0.	OITOL	ONCE	MEMORINE CITYENTE TOOK	20.	01.0	11011	10.0	DIVIDIONALE OLIVER ENTE TOOK	112	Coo i forficad Coladion Opcomod for i dollay in Table 111	1
04SP	OKGE	OKGE	LONEOAK - QUAIL CREEK 138KV	308	73.7	109.7	9.2	PANTHER - SILVER LAKE 138KV	778	Relieved or Impact Removed by Selected Upgrades for 1200 MW OKGE Terminal Equipment Project underway to increase line	
										rating. Estimated In-Service Date 9/30/2004. New Emergeny Rating 308 MVA. Relieved or Impact Removed by Selected	
04SP	OKGE	OKGE	ARCADIA - KAMO MEMORIAL 138KV	287	34.4	116.2	19.6	ARCADIA - DANFORTH 138KV	782	Upgrades for 1200 MW	
04SP	OKGE		NORTHWEST 345/138KV TRANSFORMER CKT 1	493	78.8	106.0	11.2	NORTHWEST 345/138KV TRANSFORMER CKT 2	787	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
04SP	OKGE		MORGAN - MUSTANG 138KV	287	70.3	112.8	10.2	MCCLAIN - PLEASANT VALLEY 138KV	798	See Previous Solution Specified for Facility in Table 1.1	
04SP	OKGE	OKGE	MEMORIAL - SKYLINE 138KV	287	50.8	110.1	14.2	EASTERN AVE - MEMORIAL 138KV	820	See Previous Solution Specified for Facility in Table 1.1	
										OKGE Terminal Equipment Project underway to increase line	
										rating. Estimated In-Service Date 9/30/2004. New Emergeny	
										Rating 308 MVA. Relieved or Impact Removed by Selected	
04SP	OKGE	OKGE	ARCADIA - KAMO MEMORIAL 138KV	287	23.9	116.6	22.2	ARCADIA - NORTHWEST 345KV	838	Upgrades for 1200 MW	
0401	OROL	OILOL	THEOREM TO UNE MEMORINE TOOK	207	20.0	110.0		Multiple Contingency Outage:	000	Opgrades for 1200 Mill	1
								84TH ST - TENNESSEE TAP 138KV			
								MEMORIAL - TENNESSEE TAP 138KV			
0.400	01/05	01/05	DENNICTON BARK STONEWALL (0010)	404	04.0	440.0	l		201	One Desidence Onto the One office the English in Table 4.4	
04SP		OKGE	REMNGTON PARK - STONEWALL 138KV	191	81.9	110.2	4.5	TENNESSEE - TENNESSEE TAP 138KV	864	See Previous Solution Specified for Facility in Table 1.1	
04SP	OKGE		DIVISION AVE - SILVER LAKE 138KV	287	62.6	115.6	12.7	CIMARRON - NORTHWEST 345KV	869	See Previous Solution Specified for Facility in Table 1.1	
04SP	OKGE	OKGE	ARCADIA 345/138KV TRANSFORMER CKT 1	493	51.5	109.6	23.9	ARCADIA 345/138KV TRANSFORMER CKT 2	891	See Previous Solution Specified for Facility in Table 1.1	
04SP	OKGE	OKGE	ARCADIA - REDBUD 345KV CKT 2	1195	32.9	121.0	87.7	ARCADIA - REDBUD 345KV CKT 1	912	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
04SP	OKGE	OKGE	ARCADIA - REDBUD 345KV CKT 1	1195	32.8	120.7	87.6	ARCADIA - REDBUD 345KV CKT 2	915	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
l <u></u> .	l	1		l	l	l	I				
04SP	OKGE	OKGE	HORSESHOE LAKE - KAMO MEMORIAL 138KV	287	26.3	109.2	19.8	ARCADIA - DANFORTH 138KV	927	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
04SP	OKGE	OKGE	DIVISION AVE - SILVER LAKE 138KV	287	58.5	107.4	11.7	MEMORIAL - SKYLINE 138KV	933	See Previous Solution Specified for Facility in Table 1.1	
04SP	OKGE		ARCADIA 345/138KV TRANSFORMER CKT 2	493	50.2	106.9	23.3	ARCADIA 345/138KV TRANSFORMER CKT 1	958	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
04SP	OKGE	OKGE	ARCADIA 345/138KV TRANSFORMER CKT 1	493	50.6	106.1	22.8	ARCADIA 345/138KV TRANSFORMER CKT 2	974	See Previous Solution Specified for Facility in Table 1.1	
04SP	OKGE	OKGE	HORSESHOE LAKE - KAMO MEMORIAL 138KV	287	16.5	109.4	22.2	ARCADIA - NORTHWEST 345KV	974	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
04SP	OKGE	OKGE	CIMARRON - CZECH HALL 138KV	382	68.2	101.5	10.6	MCCLAIN - PLEASANT VALLEY 138KV	976	See Previous Solution Specified for Facility in Table 1.1	
04SP	OKGE	OKGE	MEMORIAL - SKYLINE 138KV	287	57.9	102.3	10.6	DIVISION AVE - LAKESIDE 138KV	990	See Previous Solution Specified for Facility in Table 1.1	
04SP	OKGE	OKGE	DIVISION AVE - SILVER LAKE 138KV	287	58.9	102.5	10.4	QUAIL CREEK - SKYLINE 138KV	1038	See Previous Solution Specified for Facility in Table 1.1	ĺ
04SP	OKGE		ARCADIA 345/138KV TRANSFORMER CKT 2	493	49.3	103.3	22.2	ARCADIA 345/138KV TRANSFORMER CKT 1	1067	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
0406	ONGE	ONGE	ANOADIA 340/130NV TNANGI ONWEN ON I Z	433	45.5	103.3	22.2	Multiple Contingency Outage:	1007	Trailoved of impact fremoved by delected opgrades for 1200 MW	
								84TH ST - TENNESSEE TAP 138KV MEMORIAL - TENNESSEE TAP 138KV			
0480	OKCE	OKCE	DIVISION AVE. SILVED LAKE 439KV	207	65.4	101.0	0.7		1005	Coo Bravious Colution Coorified for Escility in Table 4.4	
04SP	OKGE	OKGE	DIVISION AVE - SILVER LAKE 138KV	287	65.4	101.9	8.7	TENNESSEE - TENNESSEE TAP 138KV	1085	See Previous Solution Specified for Facility in Table 1.1	1
04SP	OKGE	OMPA	EASTERN AVE - OMPA-EDMOND HAFER 138KV	287	52.8	101.9	11.7	MEMORIAL - SKYLINE 138KV	1094	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
0.00	01/25	01105	NODTH WEST OF MONEY TO COMPANY			465.	46.5	NODELINATOR OF THE PROPERTY OF	4.45	B	
04SP	OKGE	OKGE	NORTHWEST 345/138KV TRANSFORMER CKT 2	493	73.8	100.4	10.9	NORTHWEST 345/138KV TRANSFORMER CKT 1	1134	Relieved or Impact Removed by Selected Upgrades for 1200 MW	1

				1							
Study	From			Rate	BC %	TC %			ATC		Estimated
Case	Area	To Area	Monitored Branch Overload	<mva></mva>	Loading	Loading	%TDF	Outaged Branch Causing Overload	(MW)	Solution	Cost
04SP	OKGE	OKGE	DIVISION AVE - SILVER LAKE 138KV	287	65.7	102.8	8.9	MEMORIAL - TENNESSEE TAP 138KV	1200	Invalid Contingency	
04SP	OKGE	OKGE	REMNGTON PARK - STONEWALL 138KV	191	81.5	109.2	4.4	MEMORIAL - TENNESSEE TAP 138KV	1200	Invalid Contingency	
04SH	OKGE	OKGE	ARCADIA - REDBUD 345KV CKT 2	1195	36.3	123.1	86.4	ARCADIA - REDBUD 345KV CKT 1	880	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
04011	OKOE	OKOE	ADOADIA DEDDUD OAFIOLOUT A	4405	00.0	400.0	00.0	ADCADIA DEDDUD 245KV/CKT 2	883	Deliayad ay langat Damayad by Calasted Hagradas for 1200 MW	
04SH 04SH			ARCADIA - REDBUD 345KV CKT 1 MEMORIAL - SKYLINE 138KV	1195 287	36.2 73.8	122.8 105.2	86.2 7.5	ARCADIA - REDBUD 345KV CKT 2 DANFORTH - OMPA-EDMOND HAFER 138KV	925	Relieved or Impact Removed by Selected Upgrades for 1200 MW See Previous Solution Specified for Facility in Table 1.1	
U45H	UNGE	UNGE	MEMORIAL - SKYLINE 136KV	267	73.6	105.2	7.5	DAINFORTH - OWIFA-EDIVIOND HAFER 130RV	925	OKGE Terminal Equipment Project underway to increase line	
										rating. Estimated In-Service Date 9/30/2004. New Emergeny	
										Rating 308 MVA. Relieved or Impact Removed by Selected	
04SH	OKGE	OKGE	ARCADIA - KAMO MEMORIAL 138KV	287	45.8	107.1	14.7	ARCADIA - NORTHWEST 345KV	1037	Upgrades for 1200 MW	
0.0	0.102	0.102	A TO TO THE ME TO THE TO THE	20.	.0.0			ANOTONIA MONTHINE OF CHOICE	1001	OKGE Terminal Equipment Project underway to increase line	
										rating. Estimated In-Service Date 9/30/2004. New Emergeny	
										Rating 308 MVA. Relieved or Impact Removed by Selected	
04SH	OKGE	OKGE	ARCADIA - KAMO MEMORIAL 138KV	287	54.9	104.2	11.8	ARCADIA - DANFORTH 138KV	1075	Upgrades for 1200 MW	
04SH			HORSESHOE LAKE - KAMO MEMORIAL 138KV	287	42.7	102.5	14.3	ARCADIA - NORTHWEST 345KV	1140	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
04SH	OKGE	OKGE	MEMORIAL - SKYLINE 138KV	287	69.6	101.0	7.5	EASTERN AVE - OMPA-EDMOND HAFER 138KV	1147	See Previous Solution Specified for Facility in Table 1.1	
04SH	OKGE	OKGE	HORSESHOE LAKE - KAMO MEMORIAL 138KV	287	51.4	100.0	11.6	ARCADIA - DANFORTH 138KV	1199	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
045H			EASTERN AVE - MEMORIAL 138KV	191	74.2	100.0	5.1	MEMORIAL - SKYLINE 138KV	958	See Previous Solution Specified for Facility in Table 1.1	
041 A	ONGL	ONGL	EASTERN AVE - MEMORIAE 130RV	191	74.2	100.2	3.1	WEWORIAL - SKI LINE 130KV	930	See Frevious Solution Specified for Facility III Table 1.1	
04FA	OKGE	OKGE	ARCADIA - REDBUD 345KV CKT 2	1195	27.7	114.2	86.1	ARCADIA - REDBUD 345KV CKT 1	1003	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
0 / .	0.102	0.102	ALCOHOL KEDDOD GIGHT CHILL	1100			00.1	ANOTONIA NEDBOD OTONI ON I	1000	Transfer of impact tomotous y colocicu opyruuse ist 1200 iiivi	
04FA	OKGE	OKGE	ARCADIA - REDBUD 345KV CKT 1	1195	27.7	114.0	85.9	ARCADIA - REDBUD 345KV CKT 2	1006	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
										OKGE Terminal Equipment Project underway to increase line	
										rating. Estimated In-Service Date 9/30/2004. New Emergeny	
										Rating 308 MVA. Relieved or Impact Removed by Selected	
04FA			ARCADIA - KAMO MEMORIAL 138KV	287	52.5	103.0	12.1	ARCADIA - NORTHWEST 345KV	1123	Upgrades for 1200 MW	
04WP	OKGE	OKGE	EASTERN AVE - MEMORIAL 138KV	191	68.3	114.1	7.3	MEMORIAL - SKYLINE 138KV	819	See Previous Solution Specified for Facility in Table 1.1	
04WP	OKGE	OKGE	ARCADIA - REDBUD 345KV CKT 2	1195	30.2	117.3	86.8	ARCADIA - REDBUD 345KV CKT 1	963	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
04WP	OKGE	OKGE	ARCADIA - REDBUD 345KV CKT 1	1195	30.1	117.1	86.6	ARCADIA - REDBUD 345KV CKT 2	966	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
04WP	OKGE		EASTERN AVE - MEMORIAL 138KV	191	63.8	106.0	6.7	KETCH - OMPA-FAIRVIEW 138KV	1064	See Previous Solution Specified for Facility in Table 1.1	1
04WP	OKGE	OKGE	EASTERN AVE - MEMORIAL 138KV	191	56.8	105.1	7.7	ARCADIA - KAMO MEMORIAL 138KV	1088	See Previous Solution Specified for Facility in Table 1.1	
04WP	OKGE	OKGE	EASTERN AVE - MEMORIAL 138KV	191	56.1	104.7	7.7	HORSESHOE LAKE - KAMO MEMORIAL 138KV	1097	See Previous Solution Specified for Facility in Table 1.1	
										OKGE Terminal Equipment Project underway to increase line	
				I						rating. Estimated In-Service Date 9/30/2004. New Emergeny	
				I						Rating 308 MVA. Relieved or Impact Removed by Selected	
04WP			ARCADIA - KAMO MEMORIAL 138KV	287	39.6	105.5	15.8	ARCADIA - NORTHWEST 345KV	1099	Upgrades for 1200 MW	
04WP	OKGE	OKGE	EASTERN AVE - MEMORIAL 138KV	191	60.2	102.3	6.7	OMPA-FAIRVIEW - SKYLINE 138KV	1147	See Previous Solution Specified for Facility in Table 1.1	
				I						OKGE Terminal Equipment Project underway to increase line	
I										rating. Estimated In-Service Date 9/30/2004. New Emergeny	
0.414/5	01/05	01/05	ADOADIA IZAMO MEMODIAL 400101	007	40.0	404.6	40.0	ADOADIA DANGODTII 40010''	4450	Rating 308 MVA. Relieved or Impact Removed by Selected	
04WP	UKGE	OKGE	ARCADIA - KAMO MEMORIAL 138KV	287	48.0	101.9	12.9	ARCADIA - DANFORTH 138KV	1156	Upgrades for 1200 MW	
04WP	OKGE	OKGE	HORSESHOE LAKE - KAMO MEMORIAL 138KV	287	36.5	101.2	15.5	ARCADIA - NORTHWEST 345KV	1178	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
04WP		OKGE	EASTERN AVE - MEMORIAL 138KV	191	50.2	100.4	8.0	ARCADIA - NORTHWEST 345KV	1191	See Previous Solution Specified for Facility in Table 1.1	
34441	JIKOL	SINGE	E. G. LERWAY E. MEMORIAL TOOK	101	00.2	100.4	0.0	, ONDIN HORITIMEDI O-ORV	1101	Coo . 151.546 Coldion Opcomed for Lability in Table 1.1	
05AP	OKGE	OKGE	ARCADIA - REDBUD 345KV CKT 2	1195	35.9	112.3	76.1	ARCADIA - REDBUD 345KV CKT 1	1028	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
			· · · · · · · · · · · · · · · · · · ·			Ì				,	
05AP	OKGE	OKGE	ARCADIA - REDBUD 345KV CKT 1	1195	35.8	112.0	76.0	ARCADIA - REDBUD 345KV CKT 2	1031	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
05G	OKGE	OKGE	ARCADIA - REDBUD 345KV CKT 2	1195	38.2	124.7	86.1	ARCADIA - REDBUD 345KV CKT 1	842	Relieved or Impact Removed by Selected Upgrades for 1200 MW	

Sec. CACC	Study Case	From Area	To Area	Monitored Branch Overload	Rate <mva></mva>	BC % Loading	TC % Loading	%TDF	Outaged Branch Causing Overload	ATC (MW)	Solution	Estimated Cost
OKCE OKCE ARCADIA - KAMO MEMORIAL 138KV 237 18.5 109.5 21.5 ARCADIA - NORTHWEST 345KV 1027 Roll of Impact Removed by Selected Upgrades for 1200 MV Foreign Part 1028 Part	05G	OKGE	OKGE	ARCADIA - REDBUD 345KV CKT 1	1195	38.2	124.5	86.0	ARCADIA - REDBUD 345KV CKT 2	845	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
Traing Estratack Date	05G	OKGE	OKGE	EASTERN AVE - MEMORIAL 138KV	191	45.7	111.8	10.5	MEMORIAL - SKYLINE 138KV	872		
OKCE CHICAGE ARCADIA. KAMO MEMORIAL 138VV 257 18.4 18.5 ARCADIA. BANDORTH 138VV 1082 Soo Previous Solution Specified for Facility in Table 1.1	05G	OKGE	OKGE	ARCADIA - KAMO MEMORIAL 138KV	287	18.5	108.6	21.5	ARCADIA - NORTHWEST 345KV	1022	rating. Estimated In-Service Date 9/30/2004. New Emergeny Rating 308 MVA. Relieved or Impact Removed by Selected	
Coccord Cocc	05G	OKGE	OKGE	HORSESHOE LAKE - KAMO MEMORIAL 138KV	287	16.3	106.9	21.7	ARCADIA - NORTHWEST 345KV	1049		
OKGE OKGE MEMORIAL - SKYLINE 138KV 287 480 102.1 12.7 DANFORTH - OMPA-EMOND HAFER 138KV 1109 See Previous Solution Specified for Facility in Table 1.1											rating. Estimated In-Service Date 9/30/2004. New Emergeny Rating 308 MVA. Relieved or Impact Removed by Selected Upgrades for 1200 MW	
DISCO OKGE OKGE HORSESHOE LAKE - KAMO MEMORIAL 138KV 191 33.7 10.2 18.9 ARCADIA - DANFORTH 138KV 110 Relieved or Impact Removed by Selected Upgrades for 1200 MW												
DIGIS DIGIS DIGIS EASTERN AVE - MEMORIAL 138KV 191 33.7 102.3 10.9 HORSESHOE LAKE - KAMO MEMORIAL 138KV 1138 See Provious Solution Specified for Facility in Table 1.1	05G	OKGE	OKGE	MEMORIAL - SKYLINE 138KV	287	49.0	102.1	12.7	DANFORTH - OMPA-EDMOND HAFER 138KV	1109	See Previous Solution Specified for Facility in Table 1.1	
Description Contract Contra	05G	OKGE	OKGE	EASTERN AVE - MEMORIAL 138KV	191	33.7	102.3	10.9	HORSESHOE LAKE - KAMO MEMORIAL 138KV	1138	See Previous Solution Specified for Facility in Table 1.1	
OKGE OKGE ARCADIA - KAMO MEMORIAL 138KV 287 31.4 113.0 19.5 ARCADIA - DANFORTH 138KV 845 Marcadia - M	05SP	OKGE	OKGE	NORTHWEST 345/138KV TRANSFORMER CKT 1	493	81.6	112.6	12.7	NORTHWEST 345/138KV TRANSFORMER CKT 2	652	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
SSP OKGE OKGE ARCADIA - KAMO MEMORIAL 138KV 287 31.4 113.0 19.5 ARCADIA - DANFORTH 138KV 845 11.0 19.5 ARCADIA - SEP Privolus Solution Specified for Facility in Table 1.1 11.0 19.5 11.1 11.0 11.1 11.0 19.5 11.1 11.0 19.5 11.1 11.0 19.5 11.1 11.0 19.5 11.1 11.0 19.5 11.1 11.0 19.5 11.1 11.0 19.5 11.1 11.0	05SP	OKGE	OKGE	NORTHWEST 345/138KV TRANSFORMER CKT 1	493	80.0	109.3	12.0	NORTHWEST 345/138KV TRANSFORMER CKT 2	734		
OKSE OKGE ARCADIA - KAMO MEMORIAL 138KV 287 20.9 113.7 22.2 ARCADIA - NORTHWEST 345KV 895 Relieved or Impact Removed by Selected Upgrades for 1200 MW 265P OKGE OKGE ARCADIA - REDBUD 345KV CKT 2 1195 31.0 119.3 88.0 ARCADIA - REDBUD 345KV CKT 1 935 Relieved or Impact Removed by Selected Upgrades for 1200 MW 265P OKGE OKGE ARCADIA - REDBUD 345KV CKT 1 1195 30.9 119.1 87.8 ARCADIA - REDBUD 345KV CKT 2 Multiple Contingency Outage: 8	05SP									845	rating. Estimated In-Service Date 9/30/2004. New Emergeny Rating 308 MVA. Relieved or Impact Removed by Selected Upgrades for 1200 MW	
Tating_Estimated in-Service Date 9/30/2004. New Emergeny Rating 308 MVA. Relieved or Impact Removed by Selected Upgrades for 1200 MW	05SP	OKGE	OKGE	ARCADIA 345/138KV TRANSFORMER CKT 1	493	51.3	109.9	24.1	ARCADIA 345/138KV TRANSFORMER CKT 2	892		
OSSP OKGE OKGE ARCADIA - REDBUD 345KV CKT 2 1195 31.0 119.3 88.0 ARCADIA - REDBUD 345KV CKT 1 935 Relieved or Impact Removed by Selected Upgrades for 1200 MW											rating. Estimated In-Service Date 9/30/2004. New Emergeny Rating 308 MVA. Relieved or Impact Removed by Selected Upgrades for 1200 MW	
05SP OKGE OKGE ARCADIA - REDBUD 345KV CKT 1 1195 30.9 119.1 87.8 ARCADIA - REDBUD 345KV CKT 2 938 Relieved or Impact Removed by Selected Upgrades for 1200 MW MUltiple Contingency Outage: 84TH ST - TENNESSEE TAP 138KV MEMORIAL - TENNESSEE TAP 138KV 940 See Previous Solution Specified for Facility in Table 1.1 05SP OKGE OKGE NORTHWEST 345/138KV TRANSFORMER CKT 2 493 74.6 103.2 11.7 NORTHWEST 345/138KV TRANSFORMER CKT 1 941 Relieved or Impact Removed by Selected Upgrades for 1200 MW See Previous Solution Specified for Facility in Table 1.1 05SP OKGE OKGE ARCADIA 345/138KV TRANSFORMER CKT 2 493 50.0 107.1 23.4 ARCADIA 345/138KV TRANSFORMER CKT 1 952 Relieved or Impact Removed by Selected Upgrades for 1200 MW 505P OKGE OKGE ARCADIA 345/138KV TRANSFORMER CKT 1 493 50.5 106.3 22.9 ARCADIA 345/138KV TRANSFORMER CKT 2 967 See Previous Solution Specified for Facility in Table 1.1 05SP OKGE OKGE HORSESHOE LAKE - KAMO MEMORIAL 138KV 287 22.5 105.3 19.8 ARCADIA - DANFORTH 138KV 1018 Relieved or Impact Removed by Selected Upgrades for 1200 MW 505P OKGE OKGE HORSESHOE LAKE - KAMO MEMORIAL 138KV 287 12.4 105.6 22.3 ARCADIA - NORTHWEST 345/138KV TRANSFORMER CKT 1 1055 Relieved or Impact Removed by Selected Upgrades for 1200 MW 505P OKGE OKGE ARCADIA 345/138KV TRANSFORMER CKT 2 493 49.2 103.5 22.3 ARCADIA - NORTHWEST 345KV 1058 Relieved or Impact Removed by Selected Upgrades for 1200 MW 505P OKGE OKGE ARCADIA 345/138KV TRANSFORMER CKT 1 1055 Relieved or Impact Removed by Selected Upgrades for 1200 MW 505P OKGE OKGE ARCADIA 345/138KV TRANSFORMER CKT 1 1055 Relieved or Impact Removed by Selected Upgrades for 1200 MW 505P OKGE OKGE ARCADIA 345/138KV TRANSFORMER CKT 1 1055 Relieved or Impact Removed by Selected Upgrades for 1200 MW 505P OKGE OKGE ARCADIA 345/138KV TRANSFORMER CKT 1 1055 Relieved or Impact Removed by Selected Upgrades for 1200 MW 505P OKGE OKGE ARCADIA 345/138KV TRANSFORMER CKT 1 1055 Relieved or Impact Removed by Selected Upgrades for 1200 MW 505P OKGE OKGE ARCADIA 345/138KV TRANSFORMER CKT 1 1055 Relieved or Impact	05SP	OKGE	OKGE	CIMARRON - CZECH HALL 138KV	382	70.1	105.5	11.3	MCCLAIN - PLEASANT VALLEY 138KV	926	See Previous Solution Specified for Facility in Table 1.1	
Multiple Contingency Outage: 84TH ST - TENNESSEE TAP 138KV	05SP	OKGE	OKGE	ARCADIA - REDBUD 345KV CKT 2	1195	31.0	119.3	88.0	ARCADIA - REDBUD 345KV CKT 1	935	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
Multiple Contingency Outage: 84TH ST - TENNESSEE TAP 138KV	05SP	OKGE	OKGE	ARCADIA - REDBUD 345KV CKT 1	1195	30.9	119 1	87.8	ARCADIA - REDBUD 345KV CKT 2	938	Relieved or Impact Removed by Selected Ungrades for 1200 MW	
05SP OKGE OKGE NORTHWEST 345/138KV TRANSFORMER CKT 2 493 74.6 103.2 11.7 NORTHWEST 345/138KV TRANSFORMER CKT 1 941 Relieved or Impact Removed by Selected Upgrades for 1200 MW 05SP OKGE OKGE ARCADIA 345/138KV TRANSFORMER CKT 2 493 50.0 107.1 23.4 ARCADIA 345/138KV TRANSFORMER CKT 1 952 Relieved or Impact Removed by Selected Upgrades for 1200 MW 05SP OKGE OKGE ARCADIA 345/138KV TRANSFORMER CKT 1 493 50.5 106.3 22.9 ARCADIA 345/138KV TRANSFORMER CKT 2 967 See Previous Solution Specified for Facility in Table 1.1 05SP OKGE OKGE HORSESHOE LAKE - KAMO MEMORIAL 138KV 287 22.5 105.3 19.8 ARCADIA - DANFORTH 138KV 1018 Relieved or Impact Removed by Selected Upgrades for 1200 MW 05SP OKGE HORSESHOE LAKE - KAMO MEMORIAL 138KV 287 12.4 105.6 22.3 ARCADIA - NORTHWEST 345KV 1053 Relieved or Impact Removed by Selected Upgrades for 1200 MW 05SP OKGE OKGE ARCADIA 345/138KV TRANSFORMER CKT 1 49.2 103.5 22.3									Multiple Contingency Outage: 84TH ST - TENNESSEE TAP 138KV MEMORIAL - TENNESSEE TAP 138KV	940		
OSSP OKGE OKGE ARCADIA 345/138KV TRANSFORMER CKT 1 493 50.5 106.3 22.9 ARCADIA 345/138KV TRANSFORMER CKT 2 967 See Previous Solution Specified for Facility in Table 1.1 05SP OKGE OKGE HORSESHOE LAKE - KAMO MEMORIAL 138KV 287 22.5 105.3 19.8 ARCADIA - DANFORTH 138KV 1018 Relieved or Impact Removed by Selected Upgrades for 1200 MW 05SP OKGE OKGE HORSESHOE LAKE - KAMO MEMORIAL 138KV 287 12.4 105.6 22.3 ARCADIA - NORTHWEST 345KV 1053 Relieved or Impact Removed by Selected Upgrades for 1200 MW 05SP OKGE OKGE ARCADIA 345/138KV TRANSFORMER CKT 2 493 49.2 103.5 22.3 ARCADIA 345/138KV TRANSFORMER CKT 1 1055 Relieved or Impact Removed by Selected Upgrades for 1200 MW									NORTHWEST 345/138KV TRANSFORMER CKT 1	941	·	
05SP OKGE HORSESHOE LAKE - KAMO MEMORIAL 138KV 287 22.5 105.3 19.8 ARCADIA - DANFORTH 138KV 1018 Relieved or Impact Removed by Selected Upgrades for 1200 MW 05SP OKGE HORSESHOE LAKE - KAMO MEMORIAL 138KV 287 12.4 105.6 22.3 ARCADIA - NORTHWEST 345KV 1053 Relieved or Impact Removed by Selected Upgrades for 1200 MW 05SP OKGE OKGE ARCADIA 345/138KV TRANSFORMER CKT 2 493 49.2 103.5 22.3 ARCADIA 345/138KV TRANSFORMER CKT 1 1055 Relieved or Impact Removed by Selected Upgrades for 1200 MW												
05SP OKGE DKGE HORSESHOE LAKE - KAMO MEMORIAL 138KV 287 12.4 105.6 22.3 ARCADIA - NORTHWEST 345KV 1053 Relieved or Impact Removed by Selected Upgrades for 1200 MW 05SP OKGE OKGE ARCADIA 345/138KV TRANSFORMER CKT 2 493 49.2 103.5 22.3 ARCADIA 345/138KV TRANSFORMER CKT 1 1055 Relieved or Impact Removed by Selected Upgrades for 1200 MW	05SP	OKGE	OKGE	ARCADIA 345/138KV TRANSFORMER CKT 1	493	50.5	106.3	22.9	ARCADIA 345/138KV TRANSFORMER CKT 2	967	See Previous Solution Specified for Facility in Table 1.1	
05SP OKGE OKGE ARCADIA 345/138KV TRANSFORMER CKT 2 493 49.2 103.5 22.3 ARCADIA 345/138KV TRANSFORMER CKT 1 1055 Relieved or Impact Removed by Selected Upgrades for 1200 MW	05SP	OKGE	OKGE	HORSESHOE LAKE - KAMO MEMORIAL 138KV	287	22.5	105.3	19.8	ARCADIA - DANFORTH 138KV	1018	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
	05SP	OKGE	OKGE	HORSESHOE LAKE - KAMO MEMORIAL 138KV	287	12.4	105.6	22.3	ARCADIA - NORTHWEST 345KV	1053	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
1	05SP	OKGE	OKGE	ARCADIA 345/138KV TRANSFORMER CKT 2	493	49.2	103.5	22.3	ARCADIA 345/138KV TRANSFORMER CKT 1	1055	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
05SP OKGE OKGE LONEOAK - QUAIL CREEK 138KV 308 67.5 100.5 8.5 NORTHWEST - PANTHER 138KV 1141 Relieved or Impact Removed by Selected Upgrades for 1200 MW 05SP OKGE OKGE ARCADIA 345/138KV TRANSFORMER CKT 1 493 40.5 100.3 24.6 ARCADIA - NORTHWEST 345KV 1189 See Previous Solution Specified for Facility in Table 1.1	05SP	OKGE		LONEOAK - QUAIL CREEK 138KV	308	67.5	100.5	8.5	NORTHWEST - PANTHER 138KV	1141	Relieved or Impact Removed by Selected Upgrades for 1200 MW	

Study	From			Rate	BC %	TC %			ATC		Estimated
Case	Area	To Area	Monitored Branch Overload	<mva></mva>	Loading	Loading	%TDF	Outaged Branch Causing Overload	(MW)	Solution	Cost
					Ŭ	Ĭ		0	` /		
05SP	OKGE	OKGE	NORTHWEST 345/138KV TRANSFORMER CKT 2	493	73.3	100.0	11.0	NORTHWEST 345/138KV TRANSFORMER CKT 1	1194	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
05SP	OKGE	OKGE	REMNGTON PARK - STONEWALL 138KV	191	77.2	106.1	4.6	MEMORIAL - TENNESSEE TAP 138KV	1200	Invalid Contingency	
										Not a valid Overload; Relays trip to open UG transmission line	
05SP	OKGE	OKGE	TINKER #2 - TINKER #4 138KV	100	48.9	119.6	5.9	POOST ROAD - SE15TH 138KV	1200	when loading reaches 100%, No problem exist with line open.	
05SH	OKGE	OKGE	ARCADIA - REDBUD 345KV CKT 2	1195	35.9	122.8	86.5	ARCADIA - REDBUD 345KV CKT 1	883	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
05011	OKOE	OKOE	ADOADIA DEDDUD GASKA OKT 4	4405	05.0	400.5	00.0	ADOADIA DEDDUD GASKA OKT G	000	Delice of an Irra at Decreased by Orleans della sector (as 4000 MW	
055H	OKGE	OKGE	ARCADIA - REDBUD 345KV CKT 1	1195	35.8	122.5	86.3	ARCADIA - REDBUD 345KV CKT 2	886	Relieved or Impact Removed by Selected Upgrades for 1200 MW OKGE Terminal Equipment Project underway to increase line	
										rating. Estimated In-Service Date 9/30/2004. New Emergeny	
										Rating 308 MVA. Relieved or Impact Removed by Selected	
UESH	OKCE	OKGE	ARCADIA - KAMO MEMORIAL 138KV	287	47.8	109.4	14.7	ARCADIA - NORTHWEST 345KV	1003	Upgrades for 1200 MW	
03311	ONGE	ONGE	ARCADIA - KAIVIO IVIEIVIORIAL 136KV	201	47.0	109.4	14.7	ARCADIA - NORTHWEST 343RV	1003	OKGE Terminal Equipment Project underway to increase line	
										rating. Estimated In-Service Date 9/30/2004. New Emergeny	
										Rating 308 MVA. Relieved or Impact Removed by Selected	
UESH	OKCE	OKGE	ARCADIA - KAMO MEMORIAL 138KV	287	57.3	106.7	11.8	ARCADIA - DANFORTH 138KV	1016	Upgrades for 1200 MW	
03311	ONGL	ONGL	ANCADIA - NAIMO MEMONIAE 136NV	201	31.3	100.7	11.0	AROADIA - DANI ORTIT 130KV	1010	Opgrades for 1200 MW	
05SH	OKGE	OKGE	NORTHWEST 345/138KV TRANSFORMER CKT 1	493	83.5	101.0	7.2	NORTHWEST 345/138KV TRANSFORMER CKT 2	1096	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
03011	ONOL	ONOL	NORTHWEST 343/130KV TRANSFORMER ORT	433	00.0	101.0	1.2	NORTHWEST SHOP TOOK THE WAS CHARLES ON E	1030	Tremered of impact removed by delected opgrades for 1200 MVV	
05SH	OKGE	OKGE	HORSESHOE LAKE - KAMO MEMORIAL 138KV	287	44.4	104.4	14.3	ARCADIA - NORTHWEST 345KV	1105	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
000	0.102	0.102	THOROLOGICE BINE TO MICH MEMORINE TOOK	20.				Multiple Contingency Outage:	1100		
								84TH ST - TENNESSEE TAP 138KV			
								MEMORIAL - TENNESSEE TAP 138KV			
05SH	OKGE	OKGE	REMNGTON PARK - STONEWALL 138KV	191	74.1	101.0	4.3	TENNESSEE - TENNESSEE TAP 138KV	1139	See Previous Solution Specified for Facility in Table 1.1	
05SH	OKGE	OKGE	HORSESHOE LAKE - KAMO MEMORIAL 138KV	287	53.4	102.1	11.6	ARCADIA - DANFORTH 138KV	1141	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
05SH	OKGE	OKGE	ARCADIA 345/138KV TRANSFORMER CKT 1	493	59.3	100.2	16.8	ARCADIA 345/138KV TRANSFORMER CKT 2	1193	See Previous Solution Specified for Facility in Table 1.1	
										· · · · · · · · · · · · · · · · · · ·	
05FA	OKGE	OKGE	ARCADIA - REDBUD 345KV CKT 2	1195	26.2	113.2	86.6	ARCADIA - REDBUD 345KV CKT 1	1017	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
05FA	OKGE	OKGE	ARCADIA - REDBUD 345KV CKT 1	1195	26.2	113.0	86.5	ARCADIA - REDBUD 345KV CKT 2	1020	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
05FA	OKGE	OKGE	EASTERN AVE - MEMORIAL 138KV	191	53.8	102.5	7.8	MEMORIAL - SKYLINE 138KV	1102	See Previous Solution Specified for Facility in Table 1.1	
										OKGE Terminal Equipment Project underway to increase line	
										rating. Estimated In-Service Date 9/30/2004. New Emergeny	
										Rating 308 MVA. Relieved or Impact Removed by Selected	
05FA	OKGE	OKGE	ARCADIA - KAMO MEMORIAL 138KV	287	29.6	101.5	17.2	ARCADIA - NORTHWEST 345KV	1162	Upgrades for 1200 MW	
05WP	OKGE	OKGE	ARCADIA - REDBUD 345KV CKT 2	1195	35.3	121.9	86.2	ARCADIA - REDBUD 345KV CKT 1	897	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
05WP	OKGE	OKGE	ARCADIA - REDBUD 345KV CKT 1	1195	35.2	121.7	86.1	ARCADIA - REDBUD 345KV CKT 2	900	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
						I				OKGE Terminal Equipment Project underway to increase line	
										rating. Estimated In-Service Date 9/30/2004. New Emergeny	
										Rating 308 MVA. Relieved or Impact Removed by Selected	
05WP	OKGE	OKGE	ARCADIA - KAMO MEMORIAL 138KV	287	52.2	103.8	12.3	ARCADIA - NORTHWEST 345KV	1113	Upgrades for 1200 MW	
0=0=	01/05	01/07	NODTI IIMPOT O 45/400/4/ TT	45-				NODTH WEST OF STREET			
07SP	OKGE	OKGE	NORTHWEST 345/138KV TRANSFORMER CKT 1	493	83.4	117.6	14.1	NORTHWEST 345/138KV TRANSFORMER CKT 2	588	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
0705	01/05	OKOE	NODTH WEST OF HOOK! TRANSCORES OF	400	04.0	440.0	40.4	NODELIMENT OF MANAGED AND CONTROL	005	Delice and an instruct Democratike Only of all instruction (1999 MM)	
07SP	OKGE	OKGE	NORTHWEST 345/138KV TRANSFORMER CKT 1	493	81.8	113.8	13.1	NORTHWEST 345/138KV TRANSFORMER CKT 2	665	Relieved or Impact Removed by Selected Upgrades for 1200 MW OKGE Terminal Equipment Project underway to increase line	1
						I				rating. Estimated In-Service Date 9/30/2004. New Emergeny	
0705	01/05	01/05	ADOADIA KAMO MEMODIAL 40010	007	00.0	44- 4	00.0	ADCADIA DANGORTH 400101	007	Rating 308 MVA. Relieved or Impact Removed by Selected	
		OKGE	ARCADIA - KAMO MEMORIAL 138KV	287	30.2	117.4	20.9	ARCADIA - DANFORTH 138KV	837	Upgrades for 1200 MW	1 1
07SP	OKGE	OKGE	ARCADIA 345/138KV TRANSFORMER CKT 1	493	52.3	114.4	25.5	ARCADIA 345/138KV TRANSFORMER CKT 2	855	See Previous Solution Specified for Facility in Table 1.1	1
0700	OVCE	OKCE	NODTHWEST 245/420KV TRANSCORMED OVER	400	70.4	107.0	10.0	NODTHWEST 245/420KV TO ANGEODERS OVER	070	Delianad as Impact Demond by Calcuted University 5 4000 MM	
07SP	UKGE	OKGE	NORTHWEST 345/138KV TRANSFORMER CKT 2	493	76.4	107.8	12.9	NORTHWEST 345/138KV TRANSFORMER CKT 1	879	Relieved or Impact Removed by Selected Upgrades for 1200 MW	

Study Case	From Area	To Area	Monitored Branch Overload	Rate <mva></mva>	BC % Loading	TC %	%TDF	Outaged Branch Causing Overload	ATC (MW)	Solution	Estimated Cost
Oase	Alca	TO Alea	WORKER BRANCH OVERBOAD	NIVA>	Loading	Loading	70121	Outaged Branch Gadshing Overload	(10100)	OKGE Terminal Equipment Project underway to increase line rating. Estimated In-Service Date 9/30/2004. New Emergeny Rating 308 MVA. Relieved or Impact Removed by Selected	0031
07SP	OKGE	OKGE	ARCADIA - KAMO MEMORIAL 138KV	287	19.1	117.1	23.4	ARCADIA - NORTHWEST 345KV	888	Upgrades for 1200 MW	
								Multiple Contingency Outage: 84TH ST - TENNESSEE TAP 138KV			
07SP	OKGE	OKGE	REMNGTON PARK - STONEWALL 138KV	191	80.7	114.1	5.3	MEMORIAL - TENNESSEE TAP 138KV TENNESSEE - TENNESSEE TAP 138KV	898	See Previous Solution Specified for Facility in Table 1.1	
07SP	OKGE		ARCADIA 345/138KV TRANSFORMER CKT 2	493	51.0	111.6	24.9	ARCADIA 345/138KV TRANSFORMER CKT 1	908	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
07SP	OKGE OKGE		ARCADIA 345/138KV TRANSFORMER CKT 1 CIMARRON - CZECH HALL 138KV	493 382	51.5 70.1	110.3 110.7	24.2 12.9	ARCADIA 345/138KV TRANSFORMER CKT 2 MCCLAIN - PLEASANT VALLEY 138KV	916 952	See Previous Solution Specified for Facility in Table 1.1	
										See Previous Solution Specified for Facility in Table 1.1	
07SP	OKGE	OKGE	ARCADIA - REDBUD 345KV CKT 2	1195	28.7	117.5	88.4	ARCADIA - REDBUD 345KV CKT 1	966	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
07SP	OKGE	OKGE	ARCADIA - REDBUD 345KV CKT 1	1195	28.6	117.2	88.2	ARCADIA - REDBUD 345KV CKT 2	968	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
07SP	OKGE	OKGE	NORTHWEST 345/138KV TRANSFORMER CKT 2	493	74.9	104.2	12.0	NORTHWEST 345/138KV TRANSFORMER CKT 1	970	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
07SP	OKGE	OKGE	ARCADIA 345/138KV TRANSFORMER CKT 2	493	50.2	107.4	23.5	ARCADIA 345/138KV TRANSFORMER CKT 1	976	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
07SP	OKGE	OKGE	HORSESHOE LAKE - KAMO MEMORIAL 138KV	287	19.7	108.3	21.2	ARCADIA - DANFORTH 138KV	991	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
07SP	OKGE	OKGE	DIVISION AVE - HAYMAKER 138KV	287	68.3	106.7	9.2	CIMARRON - CZECH HALL 138KV	992	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
07SP	OKGE	OKGE	LONEOAK - QUAIL CREEK 138KV	308	68.5	105.1	9.4	NORTHWEST - PANTHER 138KV	997	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
07SP	OKGE	OKGE	LONEOAK - QUAIL CREEK 138KV	308	67.7	104.3	9.4	PANTHER - SILVER LAKE 138KV	1027	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
07SP	OKGE		HORSESHOE LAKE - KAMO MEMORIAL 138KV	287	9.0	107.5	23.6	ARCADIA - NORTHWEST 345KV	1038	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
07SP	OKGE	OKGE	ARCADIA 345/138KV TRANSFORMER CKT 1	493	40.9	103.5	25.7	ARCADIA - NORTHWEST 345KV	1116	See Previous Solution Specified for Facility in Table 1.1	
07SP	OKGE	OKGE	DIVISION AVE - HAYMAKER 138KV	287	63.7	101.6	9.1	CZECH HALL - XEROX 138KV	1149	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
07SP	OKGE	OMPA	EASTERN AVE - OMPA-EDMOND HAFER 138KV	287	49.3	101.6	12.5	MEMORIAL - SKYLINE 138KV	1149	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
07SP	OKGE	OKGE	NORTHWEST 345/138KV TRANSFORMER CKT 1	493	67.1	100.7	13.8	CIMARRON - NORTHWEST 345KV	1173	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
07SP	OKGE		ARCADIA 345/138KV TRANSFORMER CKT 1	493	40.5	100.4	24.6	ARCADIA - NORTHWEST 345KV	1188	See Previous Solution Specified for Facility in Table 1.1	
07SP	OKGE		CIMARRON - CZECH HALL 138KV	382	57.2	100.2	13.7	DIVISION AVE - HAYMAKER 138KV MEMORIAL - TENNESSEE TAP 138KV	1195	See Previous Solution Specified for Facility in Table 1.1	
07SP	OKGE OKGE		DIVISION AVE - LAKESIDE 138KV REMNGTON PARK - STONEWALL 138KV	287 191	84.8 80.3	101.0 112.9	3.9 5.2	MEMORIAL - TENNESSEE TAP 138KV MEMORIAL - TENNESSEE TAP 138KV	1200 1200	Invalid Contingency Invalid Contingency	1
07WP	OKGE		ARCADIA - REDBUD 345KV CKT 2	1195	32.7	120.3	87.2	ARCADIA - REDBUD 345KV CKT 1	919	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
07WP	OKGE		ARCADIA - REDBUD 345KV CKT 1	1195	32.6	120.0	87.1	ARCADIA - REDBUD 345KV CKT 2	922	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
07WP		OKGE	ARCADIA - KAMO MEMORIAL 138KV	287	17.0	103.8	20.8	ARCADIA - NORTHWEST 345KV	1109	OKGE Terminal Equipment Project underway to increase line rating. Estimated In-Service Date 9/30/2004. New Emergeny Rating 308 MVA. Relieved or Impact Removed by Selected Upgrades for 1200 MW Facility Limits Service to 1195 MW 6/1/2009-10/1/2009 and Limits Renewal Rights to 1165 MW 6/1/2010 with Selected Upgrades	
10SP	OKGE	OKGE	NORTHWEST 345/138KV TRANSFORMER CKT 1	493	85.8	119.8	14.0	NORTHWEST 345/138KV TRANSFORMER CKT 2	582	modeled for 1200 MW,	
10SP		OKGE OKGE	NORTHWEST 345/138KV TRANSFORMER CKT 1 ARCADIA 345/138KV TRANSFORMER CKT 1	493 493	84.1 53.0	116.2 116.6	13.2 26.1	NORTHWEST 345/138KV TRANSFORMER CKT 2 ARCADIA 345/138KV TRANSFORMER CKT 2	654 867	Relieved or Impact Removed by Selected Upgrades for 1200 MW See Previous Solution Specified for Facility in Table 1.1	
1007	UNGE	UNGE	I ARCADIA 343/136KV TRANSFURIVER CKT 1	493	. ⊃3.∪	1 I I D.D	Z0.1	I ARCADIA 343/138KV IKANSPURIVIEK CKTZ	007	See Frevious Solution Specified for Facility in Table 1.1	1

Cturdur	From			Rate	BC %	TC %			ATC		Estimated
Study Case	Area	To Area	Monitored Branch Overload	<mva></mva>	Loading	Loading	%TDF	Outaged Branch Causing Overload	(MW)	Solution	Cost
10SP	OKGE	OKGE	NORTHWEST 345/138KV TRANSFORMER CKT 2	493	78.6	109.9	12.9	NORTHWEST 345/138KV TRANSFORMER CKT 1	868	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
10SP	OKGE	OKGE	POOST ROAD - SE15TH 138KV	191	46.7	112.1	10.4	POOST ROAD - TINKER #5 138KV	878		
10SP	OKGE	OKGE	ARCADIA - KAMO MEMORIAL 138KV	287	29.0	118.0	21.3	ARCADIA - DANFORTH 138KV	901	OKGE Terminal Equipment Project underway to increase line rating. Estimated In-Service Date 9/30/2004. New Emergeny Rating 308 MVA. Relieved or Impact Removed by Selected Upgrades for 1200 MW	
10SP	OKGE		ARCADIA 345/138KV TRANSFORMER CKT 2 ARCADIA 345/138KV TRANSFORMER CKT 1	493 493	51.7	113.6	25.5 24.8	ARCADIA 345/138KV TRANSFORMER CKT 1 ARCADIA 345/138KV TRANSFORMER CKT 2	911	Relieved or Impact Removed by Selected Upgrades for 1200 MW See Previous Solution Specified for Facility in Table 1.1	
		OKGE	ARCADIA 345/138KV TRANSFORMER CKT 1 ARCADIA - KAMO MEMORIAL 138KV	287	52.1 16.0	112.4	24.8	ARCADIA 345/138KV TRANSFORMER CKT 2 ARCADIA - NORTHWEST 345KV	921	See Previous Solution Specified for Facility in 1 able 1.1 OKGE 1 erminal Equipment Project underway to increase line rating. Estimated In-Service Date 9/30/2004. New Emergeny Rating 308 MVA. Relieved or Impact Removed by Selected Upgrades for 1200 MW	
10SP	OKGE	OKGE	ARCADIA 345/138KV TRANSFORMER CKT 2	493	50.8	109.5	24.1	ARCADIA 345/138KV TRANSFORMER CKT 1	970	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
10SP	OKGE	OKGE	NORTHWEST 345/138KV TRANSFORMER CKT 2	493	77.0	106.4	12.1	NORTHWEST 345/138KV TRANSFORMER CKT 1	981	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
10SP	OKGE	OKGE	ARCADIA - REDBUD 345KV CKT 2	1195	25.5	114.2	88.3	ARCADIA - REDBUD 345KV CKT 1	1010	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
10SP	OKGE	OKGE	ARCADIA - REDBUD 345KV CKT 1	1195	25.4	113.9	88.1	ARCADIA - REDBUD 345KV CKT 2	1013	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
10SP	OKGE	OKGE	HORSESHOE LAKE - KAMO MEMORIAL 138KV	287	17.0	107.2	21.6	ARCADIA - DANFORTH 138KV	1039	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
10SP	OKGE	OKGE OKGE	LONEOAK - QUAIL CREEK 138KV CIMARRON - CZECH HALL 138KV	308 382	67.8 68.6	103.7 107.0	9.2 12.2	NORTHWEST - PANTHER 138KV MCCLAIN - PLEASANT VALLEY 138KV	1095 1104	Relieved or Impact Removed by Selected Upgrades for 1200 MW See Previous Solution Specified for Facility in Table 1.1	
10SP	OKGE		HORSESHOE LAKE - KAMO MEMORIAL 138KV	287	4.4	107.0	24.1	ARCADIA - NORTHWEST 345KV	1104	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
10SP	OKGE	OKGE	LONEOAK - QUAIL CREEK 138KV	308	67.0	102.9	9.2	PANTHER - SILVER LAKE 138KV	1118	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
10SP	OKGE OKGE		NORTHWEST 345/138KV TRANSFORMER CKT 1 ARCADIA 345/138KV TRANSFORMER CKT 1	493 493	69.1 39.9	102.6 103.8	13.8 26.3	CIMARRON - NORTHWEST 345KV ARCADIA - NORTHWEST 345KV	1121 1124	Relieved or Impact Removed by Selected Upgrades for 1200 MW See Previous Solution Specified for Facility in Table 1.1	
10SP	OKGE		DIVISION AVE - HAYMAKER 138KV ARCADIA 345/138KV TRANSFORMER CKT 1	287 493	67.1 39.5	103.3	8.6 25.2	CIMARRON - CZECH HALL 138KV ARCADIA - NORTHWEST 345KV	1144	Relieved or Impact Removed by Selected Upgrades for 1200 MW See Previous Solution Specified for Facility in Table 1.1	
			REMNGTON PARK - STONEWALL 138KV	191	71.2	100.9	4.7	Multiple Contingency Outage: 84TH ST - TENNESSEE TAP 138KV MEMORIAL - TENNESSEE TAP 138KV TENNESSEE - TENNESSEE TAP 138KV	1185	See Previous Solution Specified for Facility in Table 1.1	
	OKGE		NORTHWEST 345/138KV TRANSFORMER CKT 1	493	68.0	100.9	13.3	CIMARRON - NORTHWEST 345KV		Relieved or Impact Removed by Selected Upgrades for 1200 MW	
10SP	OKGE		TINKER #2 - TINKER #4 138KV	100	82.3	141.1	4.9	POOST ROAD - SE15TH 138KV	1200	Not a valid Overload; Relays trip to open UG transmission line when loading reaches 100%, No problem exist with line open.	
	OKGE		ARCADIA - REDBUD 345KV CKT 2	1195	32.4	117.6	84.8	ARCADIA - REDBUD 345KV CKT 1	954	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
	OKGE		ARCADIA - REDBUD 345KV CKT 1	1195	32.4	117.4	84.7	ARCADIA - REDBUD 345KV CKT 2	957	Relieved or Impact Removed by Selected Opgrades for 1200 MW	
		OKGE	ARCADIA - KAMO MEMORIAL 138KV	287	34.7	106.5	17.2	ARCADIA - NORTHWEST 345KV	1052	OKGE Terminal Equipment Project underway to increase line rating. Estimated In-Service Date 9/30/2004. New Emergeny Rating 308 MVA. Relieved or Impact Removed by Selected Upgrades for 1200 MW	

SPP-2003-271-2 Table 1.2 - SPP Facility Overloads Caused or Impacted by 1200 MW Transfer using Scenario 3

Study Case		To Area	Monitored Branch Overload	Rate <mva></mva>	BC % Loading	TC % Loading	%TDF	Outaged Branch Causing Overload	ATC (MW)	Solution	Estimated Cost
										OKGE Terminal Equipment Project underway to increase line	
										rating. Estimated In-Service Date 9/30/2004. New Emergeny	
										Rating 308 MVA. Relieved or Impact Removed by Selected	
10WP	OKGE	OKGE	ARCADIA - KAMO MEMORIAL 138KV	287	42.7	102.4	14.3	ARCADIA - DANFORTH 138KV	1128	Upgrades for 1200 MW	
										Total Estimated Engineering and Construction Cost	\$ -

Charles			DC \/=\4===	TC \/-l+		ATC	I .	Fatimeted
Study Case	AREA	Monitored Bus with Violation	BC Voltage (PU)	TC Voltage (PU)	Outaged Branch Causing Voltage Violation	ATC (MW)	Solution	Estimated Cost
Ouse	7111271	Worldood Bas war violation	(1 0)	(1 0)	Cutaged Drainin Oddorng Voltage Violation	(10100)	Close normally open switch between bus 54996 & bus	0031
04SP	OKGE	54951 LITTLAX269.0	0.9266	0.8953	OPEN LINE FROM BUS 55004 [ROSEDAL269.000] TO BUS 55005 [SPRHILT269.000] CKT 1	1200	55052 by scada for mitigation.	
04SP	OKGE	54956 MACOCTP269.0	0.9236	0.8921	OPEN LINE FROM BUS 55004 [ROSEDAL269.000] TO BUS 55005 [SPRHILT269.000] CKT 1	1200	"	
04SP	OKGE	54995 SPRNGHL269.0	0.9041	0.8718	OPEN LINE FROM BUS 55004 [ROSEDAL269.000] TO BUS 55005 [SPRHILT269.000] CKT 1	1200	II .	
04SP	OKGE	54996 ETOWAH 269.0	0.9114	0.8794	OPEN LINE FROM BUS 55004 [ROSEDAL269.000] TO BUS 55005 [SPRHILT269.000] CKT 1	1200	II .	
04SP	OKGE	55001 MACOMOC269.0	0.9213	0.8898	OPEN LINE FROM BUS 55004 [ROSEDAL269.000] TO BUS 55005 [SPRHILT269.000] CKT 1	1200	11	
04SP	OKGE	55005 SPRHILT269.0	0.9050	0.8728	OPEN LINE FROM BUS 55004 [ROSEDAL269.000] TO BUS 55005 [SPRHILT269.000] CKT 1	1200	11	
04SP	OMPA	56185 OMLXNTN169.0	0.9030	0.8718	OPEN LINE FROM BUS 55004 [ROSEDAL269.000] TO BUS 55005 [SPRHILT269.000] CKT 1	1200	"	
043F	OIVIPA	36163 OWLANTIN169.0	0.9041	0.0710	OPEN LINE FROM BUS 33004 [RUSEDALZ09.000] TO BUS 33003 [SPRHILT209.000] CRT T	1200	Close normally open switch between bus 54996 & bus	
0400	OKCE	54054 LITTLA V260 0	0.9231	0.8909	OPEN LINE FROM RUS FROM IDOSERAL 200 0001 TO RUS FROM IDAOL L 200 0001 CICT 4	4000		
04SP	OKGE	54951 LITTLAX269.0			OPEN LINE FROM BUS 55004 [ROSEDAL269.000] TO BUS 55099 [PAOLI 269.000] CKT 1	1200	55052 by scada for mitigation.	
04SP	OKGE	54956 MACOCTP269.0	0.9199	0.8875	OPEN LINE FROM BUS 55004 [ROSEDAL269.000] TO BUS 55099 [PAOLI 269.000] CKT 1	1200		
04SP	OKGE	54995 SPRNGHL269.0	0.8984	0.8651	OPEN LINE FROM BUS 55004 [ROSEDAL269.000] TO BUS 55099 [PAOLI 269.000] CKT 1	1200	"	
04SP	OKGE	54996 ETOWAH 269.0	0.9069	0.8740	OPEN LINE FROM BUS 55004 [ROSEDAL269.000] TO BUS 55099 [PAOLI 269.000] CKT 1	1200	"	
04SP	OKGE	55001 MACOMOC269.0	0.9177	0.8852	OPEN LINE FROM BUS 55004 [ROSEDAL269.000] TO BUS 55099 [PAOLI 269.000] CKT 1	1200	"	
04SP	OKGE	55004 ROSEDAL269.0	0.8981	0.8648	OPEN LINE FROM BUS 55004 [ROSEDAL269.000] TO BUS 55099 [PAOLI 269.000] CKT 1	1200	"	
04SP	OKGE	55005 SPRHILT269.0	0.8993	0.8661	OPEN LINE FROM BUS 55004 [ROSEDAL269.000] TO BUS 55099 [PAOLI 269.000] CKT 1	1200	11	
04SP	OMPA	56185 OMLXNTN169.0	0.8984	0.8651	OPEN LINE FROM BUS 55004 [ROSEDAL269.000] TO BUS 55099 [PAOLI 269.000] CKT 1	1200	TI T	
04SH		NONE IDENTIFIED				1200		
04FA		NONE IDENTIFIED		ĺ		1200		
04WP		NONE IDENTIFIED				1200		
05AP		NONE IDENTIFIED				1200		
05G		NONE IDENTIFIED				1200		
		110112 13211111 123				.200	Close normally open switch between bus 54996 & bus	
05SP	OKGE	54951 LITTLAX269.0	0.9239	0.8912	OPEN LINE FROM BUS 55004 [ROSEDAL269.000] TO BUS 55005 [SPRHILT269.000] CKT 1	1200	55052 by scada for mitigation.	
05SP	OKGE	54956 MACOCTP269.0	0.9208	0.8879	OPEN LINE FROM BUS 55004 [ROSEDAL269.000] TO BUS 55005 [SPRHILT269.000] CKT 1	1200	"	
05SP	OKGE	54995 SPRNGHL269.0	0.9004	0.8667	OPEN LINE FROM BUS 55004 [ROSEDAL269.000] TO BUS 55005 [SPRHILT269.000] CKT 1	1200	"	
05SP	OKGE	54995 SPKNGHL269.0 54996 ETOWAH 269.0	0.9004	0.8748	OPEN LINE FROM BUS 55004 [ROSEDAL269.000] TO BUS 55005 [SPRHILT269.000] CKT 1	1200	,	
							,	
05SP	OKGE	55001 MACOMOC269.0	0.9185	0.8856	OPEN LINE FROM BUS 55004 [ROSEDAL269.000] TO BUS 55005 [SPRHILT269.000] CKT 1	1200		
05SP	OKGE	55005 SPRHILT269.0	0.9013	0.8677	OPEN LINE FROM BUS 55004 [ROSEDAL269.000] TO BUS 55005 [SPRHILT269.000] CKT 1	1200		
05SP	OMPA	56185 OMLXNTN169.0	0.9004	0.8667	OPEN LINE FROM BUS 55004 [ROSEDAL269.000] TO BUS 55005 [SPRHILT269.000] CKT 1	1200		
							Close normally open switch between bus 54996 & bus	
05SP	OKGE	54951 LITTLAX269.0	0.9203	0.8866	OPEN LINE FROM BUS 55004 [ROSEDAL269.000] TO BUS 55099 [PAOLI 269.000] CKT 1	1200	55052 by scada for mitigation.	
05SP	OKGE	54956 MACOCTP269.0	0.9170	0.8831	OPEN LINE FROM BUS 55004 [ROSEDAL269.000] TO BUS 55099 [PAOLI 269.000] CKT 1	1200	"	
05SP	OKGE	54995 SPRNGHL269.0	0.8945	0.8597	OPEN LINE FROM BUS 55004 [ROSEDAL269.000] TO BUS 55099 [PAOLI 269.000] CKT 1	1200	"	
05SP	OKGE	54996 ETOWAH 269.0	0.9035	0.8690	OPEN LINE FROM BUS 55004 [ROSEDAL269.000] TO BUS 55099 [PAOLI 269.000] CKT 1	1200	"	
05SP	OKGE	55001 MACOMOC269.0	0.9147	0.8807	OPEN LINE FROM BUS 55004 [ROSEDAL269.000] TO BUS 55099 [PAOLI 269.000] CKT 1	1200	11	
05SP	OKGE	55004 ROSEDAL269.0	0.8943	0.8594	OPEN LINE FROM BUS 55004 [ROSEDAL269.000] TO BUS 55099 [PAOLI 269.000] CKT 1	1200	"	
05SP	OKGE	55005 SPRHILT269.0	0.8955	0.8607	OPEN LINE FROM BUS 55004 [ROSEDAL269.000] TO BUS 55099 [PAOLI 269.000] CKT 1	1200	"	
05SP	OMPA	56185 OMLXNTN169.0	0.8945	0.8597	OPEN LINE FROM BUS 55004 [ROSEDAL269.000] TO BUS 55099 [PAOLI 269.000] CKT 1	1200	"	
05SH		NONE IDENTIFIED				1200		
05FA		NONE IDENTIFIED				1200		
05WP		NONE IDENTIFIED				1200		
							Relieved or Impact Removed by Selected Upgrades	
07SP	OKGE	54969 NE30TH 269.0	0.9372	0.8936	OPEN LINE FROM BUS 54969 [NE30TH 269.000] TO BUS 54972 [RENO 269.000] CKT 1	1024	for 1200 MW	
							Relieved or Impact Removed by Selected Upgrades	
07SP	OKGE	54970 DEEPFKT269.0	0.9414	0.8982	OPEN LINE FROM BUS 54969 [NE30TH 269.000] TO BUS 54972 [RENO 269.000] CKT 1	1150	for 1200 MW	
0701	ONOL	04070 BEET 1 KT200.0	0.0414	0.0002	OF EN EINE FROM DOC 04000 [NECOTIT 200,000] TO DOC 04072 [NENO 200,000] OKT	1100	Relieved or Impact Removed by Selected Upgrades	
07SP	OKGE	54974 DEEPFRK269.0	0.9421	0.8988	OPEN LINE FROM BUS 54969 [NE30TH 269.000] TO BUS 54972 [RENO 269.000] CKT 1	1167	for 1200 MW	
0/35	ONGL	34974 DEEFT RR209.0	0.3421	0.0900	OF EIN EINE I KOM BOS 34909 [NESOTH 209.000] TO BOS 34972 [KENO 209.000] CKT I	1107	Relieved or Impact Removed by Selected Upgrades	
0700	OKCE	54074 CDNDACTOCO O	0.0040	0.0000	OPEN UNIT FROM BUILD FACOR (U.C.) - 000 0001 TO BUILD FACOR (CRAINDACTOR) 0001 CKT 4	4400		
07SP	OKGE	54971 GRNPAST269.0	0.9316	0.8998	OPEN LINE FROM BUS 54937 [HSL 269.000] TO BUS 54971 [GRNPAST269.000] CKT 1	1192	for 1200 MW	
	01105					4000	Close normally open switch between bus 54996 & bus	
07SP	OKGE	54956 MACOCTP269.0	0.9357	0.8983	OPEN LINE FROM BUS 54996 [ETOWAH 269.000] TO BUS 55005 [SPRHILT269.000] CKT 1	1200	55052 by scada for mitigation.	
07SP	OKGE	54996 ETOWAH 269.0	0.9268	0.8890	OPEN LINE FROM BUS 54996 [ETOWAH 269.000] TO BUS 55005 [SPRHILT269.000] CKT 1	1200	"	
07SP	OKGE	55001 MACOMOC269.0	0.9333	0.8958	OPEN LINE FROM BUS 54996 [ETOWAH 269.000] TO BUS 55005 [SPRHILT269.000] CKT 1	1200	"	
							Close normally open switch between bus 54996 & bus	
07SP	OKGE	54951 LITTLAX269.0	0.9205	0.8785	OPEN LINE FROM BUS 55004 [ROSEDAL269.000] TO BUS 55005 [SPRHILT269.000] CKT 1	1200	55052 by scada for mitigation.	
07SP	OKGE	54956 MACOCTP269.0	0.9172	0.8750	OPEN LINE FROM BUS 55004 [ROSEDAL269.000] TO BUS 55005 [SPRHILT269.000] CKT 1	1200	"	
07SP	OKGE	54991 LTRVRLK269.0	0.9382	0.8972	OPEN LINE FROM BUS 55004 [ROSEDAL269.000] TO BUS 55005 [SPRHILT269.000] CKT 1	1200	"	
07SP	OKGE	54995 SPRNGHL269.0	0.8966	0.8533	OPEN LINE FROM BUS 55004 [ROSEDAL269.000] TO BUS 55005 [SPRHILT269.000] CKT 1	1200	"	
07SP	OKGE	54996 ETOWAH 269.0	0.9042	0.8612	OPEN LINE FROM BUS 55004 [ROSEDAL269.000] TO BUS 55005 [SPRHILT269.000] CKT 1	1200	"	

Estimated		ATC		TC Voltage	BC Voltage		Study
Cost	Solution	(MW)	Outaged Branch Causing Voltage Violation	(PU)	(PU)	Monitored Bus with Violation	Case AREA
	п	1200	OPEN LINE FROM BUS 55004 (ROSEDAL269,000) TO BUS 55005 (SPRHILT269,000) CKT 1	0.8725	0.9148	55001 MACOMOC269.0	O7SP OKGE
	"	1200	OPEN LINE FROM BUS 55004 [ROSEDAL269.000] TO BUS 55005 [SPRHILT269.000] CKT 1	0.8542	0.8975	55005 SPRHILT269.0	7SP OKGE
	"	1200	OPEN LINE FROM BUS 55004 [ROSEDAL269.000] TO BUS 55005 [SPRHILT269.000] CKT 1	0.8533	0.8966	56185 OMLXNTN169.0	O7SP OMPA
	Close normally open switch between bus 54996 & bus						
	55052 by scada for mitigation.	1200	OPEN LINE FROM BUS 55004 [ROSEDAL269.000] TO BUS 55099 [PAOLI 269.000] CKT 1	0.8734	0.9165	54951 LITTLAX269.0	7SP OKGE
	"	1200	OPEN LINE FROM BUS 55004 [ROSEDAL269.000] TO BUS 55099 [PAOLI 269.000] CKT 1	0.8697	0.9130	54956 MACOCTP269.0	O7SP OKGE
	11	1200	OPEN LINE FROM BUS 55004 [ROSEDAL269.000] TO BUS 55099 [PAOLI 269.000] CKT 1	0.8975	0.9393	54983 LTRVRTP269.0	O7SP OKGE
	"	1200	OPEN LINE FROM BUS 55004 [ROSEDAL269.000] TO BUS 55099 [PAOLI 269.000] CKT 1	0.8935	0.9354	54991 LTRVRLK269.0	O7SP OKGE
	"	1200	OPEN LINE FROM BUS 55004 [ROSEDAL269.000] TO BUS 55099 [PAOLI 269.000] CKT 1	0.8455	0.8902	54995 SPRNGHL269.0	O7SP OKGE
	"	1200	OPEN LINE FROM BUS 55004 [ROSEDAL269.000] TO BUS 55099 [PAOLI 269.000] CKT 1	0.8549	0.8990	54996 ETOWAH 269.0	O7SP OKGE
	11	1200	OPEN LINE FROM BUS 55004 [ROSEDAL269.000] TO BUS 55099 [PAOLI 269.000] CKT 1	0.8671	0.9106	55001 MACOMOC269.0	O7SP OKGE
	ıı .	1200	OPEN LINE FROM BUS 55004 [ROSEDAL269.000] TO BUS 55099 [PAOLI 269.000] CKT 1	0.8451	0.8898	55004 ROSEDAL269.0	O7SP OKGE
	"	1200	OPEN LINE FROM BUS 55004 [ROSEDAL269.000] TO BUS 55099 [PAOLI 269.000] CKT 1	0.8465	0.8911	55005 SPRHILT269.0	7SP OKGE
	"	1200	OPEN LINE FROM BUS 55004 [ROSEDAL269.000] TO BUS 55099 [PAOLI 269.000] CKT 1	0.8455	0.8902	56185 OMLXNTN169.0	O7SP OMPA
		1200				NONE IDENTIFIED	7WP
	See Previous Solution Specified for Facility in Table						
	2.1	866	OPEN LINE FROM BUS 54738 [KOCH 269.000] TO BUS 54739 [MEDFORD269.000] CKT 1	0.8683	0.8960	54738 KOCH 269.0	10SP OKGE
	Relieved or Impact Removed by Selected Upgrades						
	for 1200 MW	890	OPEN LINE FROM BUS 54969 [NE30TH 269.000] TO BUS 54972 [RENO 269.000] CKT 1	0.8886	0.9328	54969 NE30TH 269.0	10SP OKGE
	Relieved or Impact Removed by Selected Upgrades						
	for 1200 MW	906	OPEN LINE FROM BUS 54738 [KOCH 269.000] TO BUS 54739 [MEDFORD269.000] CKT 1	0.8870	0.9135	54719 CLYDE 269.0	10SP OKGE
	Relieved or Impact Removed by Selected Upgrades	- 000	G. 2.1 2.1.2 . 1.6	0.00.0	0.0.00	01110 02122 200.0	
	for 1200 MW	1024	OPEN LINE FROM BUS 54969 [NE30TH 269.000] TO BUS 54972 [RENO 269.000] CKT 1	0.8936	0.9373	54970 DEEPFKT269.0	10SP OKGE
	Relieved or Impact Removed by Selected Upgrades	1021	e. 2.1 2.1 2.1 (e.m. 200 0 1000 [1.200 1.1.2 201 000] 1.0 200 0 101 [1.2 1.1 0 201 000] e. (0.0000	0.007.0	0.00.0 0.00.0	.00. 0.102
	for 1200 MW	1041	OPEN LINE FROM BUS 54969 [NE30TH 269.000] TO BUS 54972 [RENO 269.000] CKT 1	0.8942	0.9380	54974 DEEPFRK269.0	10SP OKGE
	Close normally open switch between bus 54996 & bus	1041	e. 2.1 2.1 2.1 (e.m. 200 0 1000 [1.200 1.1.2 201 000] 1.0 200 0 101 [1.2 1.1 0 201 000] e. (0.00 .2	0.0000	0.07.1222.114.200.0	1001 01102
	55052 by scada for mitigation.	1200	OPEN LINE FROM BUS 54996 [ETOWAH 269.000] TO BUS 55005 [SPRHILT269.000] CKT 1	0.8978	0.9342	54951 LITTLAX269.0	10SP OKGE
	"	1200	OPEN LINE FROM BUS 54996 [ETOWAH 269.000] TO BUS 55005 [SPRHILT269.000] CKT 1	0.8951	0.9317	54956 MACOCTP269.0	10SP OKGE
	11	1200	OPEN LINE FROM BUS 54996 [ETOWAH 269.000] TO BUS 55005 [SPRHILT269.000] CKT 1	0.8853	0.9223	54996 ETOWAH 269.0	10SP OKGE
	11	1200	OPEN LINE FROM BUS 54996 [ETOWAH 269.000] TO BUS 55005 [SPRHILT269.000] CKT 1	0.8925	0.9291	55001 MACOMOC269.0	10SP OKGE
	Close normally open switch between bus 54996 & bus	1200	OF EN EINE FROM BOO 04000 [ETOWITZ00:000] TO BOO 00000 [OF MILE 200:000] ON T	0.0020	0.0201	00001 W/(CCW/CO200.0	1001 OROL
	55052 by scada for mitigation.	1200	OPEN LINE FROM BUS 55004 [ROSEDAL269.000] TO BUS 55005 [SPRHILT269.000] CKT 1	0.8731	0.9148	54951 LITTLAX269.0	10SP OKGE
	33032 by 3cada for fillingation.	1200	OPEN LINE FROM BUS 55004 [ROSEDAL269.000] TO BUS 55005 [OF RETIZES.000] ORT 1	0.8694	0.9113	54956 MACOCTP269.0	10SP OKGE
	п	1200	OPEN LINE FROM BUS 55004 [ROSEDAL269.000] TO BUS 55005 [SPRHILT269.000] CKT 1	0.8976	0.9381	54983 LTRVRTP269.0	10SP OKGE
	11	1200	OPEN LINE FROM BUS 55004 [ROSEDAL269.000] TO BUS 55005 [SPRHILT269.000] CKT 1	0.8935	0.9341	54991 LTRVRLK269.0	10SP OKGE
	п	1200	OPEN LINE FROM BUS 55004 [ROSEDAL269.000] TO BUS 55005 [SPRHILT269.000] CKT 1	0.8459	0.8890	54995 SPRNGHL269.0	10SP OKGE
	п	1200	OPEN LINE FROM BUS 55004 [ROSEDAL269.000] TO BUS 55005 [SPRHILT269.000] CKT 1	0.8546	0.8972	54996 ETOWAH 269.0	10SP OKGE
	п	1200	OPEN LINE FROM BUS 55004 [ROSEDAL269.000] TO BUS 55005 [SPRHILT269.000] CKT 1	0.8667	0.9087	55001 MACOMOC269.0	10SP OKGE
	п	1200	OPEN LINE FROM BUS 55004 [ROSEDAL269.000] TO BUS 55005 [SPRHILT269.000] CKT 1	0.8469	0.8900	55005 SPRHILT269.0	10SP OKGE
	п	1200	OPEN LINE FROM BUS 55004 [ROSEDAL269.000] TO BUS 55005 [SPRHILT269.000] CKT 1	0.8459	0.8890	56185 OMLXNTN169.0	10SP OMPA
	Close normally open switch between bus 54996 & bus	1200	OF ENTERNA DOG 30004 [ROGEDAL208.000] TO DOG 30000 [OF REILE 208.000] ORT T	3.0433	0.0030	55105 CIVILATIV109.0	IOOI OWI A
	55052 by scada for mitigation.	1200	OPEN LINE FROM BUS 55004 [ROSEDAL269.000] TO BUS 55099 [PAOLI 269.000] CKT 1	0.8672	0.9104	54951 LITTLAX269.0	10SP OKGE
	" scada for fillingation.	1200	OPEN LINE FROM BUS 55004 [ROSEDAL269.000] TO BUS 55099 [PAOLI 269.000] CKT 1	0.8633	0.9104	54951 EITTEAX269.0 54956 MACOCTP269.0	10SP OKGE
	п	1200	OPEN LINE FROM BUS 55004 [ROSEDAL269.000] TO BUS 55099 [PAOLI 269.000] CKT 1	0.8933	0.9066	54983 LTRVRTP269.0	10SP OKGE
	п	1200	OPEN LINE FROM BUS 55004 [ROSEDAL269.000] TO BUS 55099 [PAOLI 269.000] CKT 1	0.8959	0.9375	54985 TXSTELA269.0	10SP OKGE
	n n	1200	OPEN LINE FROM BUS 55004 [ROSEDAL269.000] TO BUS 55099 [PAOLI 269.000] CKT 1	0.8891	0.9375	54991 LTRVRLK269.0	10SP OKGE
	п	1200	OPEN LINE FROM BUS 55004 [ROSEDAL269.000] TO BUS 55099 [PAOLI 269.000] CKT 1	0.8371	0.9310	54991 LTRVRLR269.0 54995 SPRNGHL269.0	10SP OKGE
	n n	1200	OPEN LINE FROM BUS 55004 [ROSEDAL269.000] TO BUS 55099 [PAOLI 269.000] CKT 1	0.8371	0.8819	54995 SPRNGHL269.0 54996 ETOWAH 269.0	10SP OKGE
	n n	1200	OPEN LINE FROM BUS 55004 [ROSEDAL269.000] TO BUS 55099 [PAOLI 269.000] CKT 1	0.8473	0.8915	55001 MACOMOC269.0	10SP OKGE
	n n	1200	OPEN LINE FROM BUS 55004 [ROSEDAL269.000] TO BUS 55099 [PAOLI 269.000] CKT 1	0.8366	0.9040	55001 MACOMOC269.0 55004 ROSEDAL269.0	10SP OKGE
	и						
		1200 1200	OPEN LINE FROM BUS 55004 [ROSEDAL269.000] TO BUS 55099 [PAOLI 269.000] CKT 1 OPEN LINE FROM BUS 55004 [ROSEDAL269.000] TO BUS 55099 [PAOLI 269.000] CKT 1	0.8381	0.8828	55005 SPRHILT269.0	
	"	1700	OPEN LINE FROM BUG SOUU4 IROGEDALZ09.0001 TO BUG SOU99 IPAOLT 269.0001 CK L 1	0.8371	0.8819	56185 OMLXNTN169.0	10SP OMPA
	"	1200		1		NONE IDENTIFIED	0WP

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Table 3.2 - SPP Facility Overloads
Caused or Impacted by Selected Upgrades
for 1200 MW using Scenario 3

					BC Without	BC With	TC Without	TC With			
Study	From			Rate	Upgrades	Upgrades	Upgrades	Upgrades			Estimated
Case	Area	To Area	Monitored Branch Overload	<mva></mva>	%Loading	%Loading	%Loading	%Loading	Outaged Branch Causing Overload	Solution	Cost
05AP			NONE IDENTIFIED								
05G			NONE IDENTIFIED								
05SH			NONE IDENTIFIED						<u> </u>		
05FA			NONE IDENTIFIED								l
									Multiple Contingency Outage: 84TH ST - TENNESSEE TAP 138KV MEMORIAL - TENNESSEE TAP 138KV		
		OKGE	STONEWALL - WESTERN 138KV	191	75.6	79.9	86.1	102.3	TENNESSEE - TENNESSEE TAP 138KV	Replace Wavetrap	\$ 50,000
07WP			NONE IDENTIFIED								
10SP			NONE IDENTIFIED								
10WP			NONE IDENTIFIED								
										Total Estimated Engineering and Construction Cost	\$ 50,000

Study	From			Rate	BC %	TC %			ATC		Estimated
Case	Area	To Area	Monitored Branch Overload	<mva></mva>	Loading	Loading	%TDF	Outaged Branch Causing Overload	(MW)	Solution	Cost
										OKGE Project to add 3rd Draper xfrmr at OGE's expense.	
04SP	OKGE	OKGE	54934 DRAPER 7 345 WND 2 DRAPER 3 1	493	88.5	107.6	7.9	54933 DRAPER 4 138 to 54934 DRAPER 7 345 to 55721 DRAPER2113.8 CKT 2	483	Estimated In-Service Date 6/1/2005. Use OKGE Redispatch as Interim Mitigation.	
04SP	OKGE		54934 DRAPER 7 345 WND 2 DRAPER 3 1 54934 DRAPER 7 345 WND 2 DRAPER 4 2	493	88.5	107.6	7.9	54933 DRAPER 4 138 to 54934 DRAPER 7 345 to 55721 DRAPER2113.8 CKT 2	483	See Previous Solution Specified for Facility	
04SP		OKGE	54933 DRAPER 4 138 WND 1 DRAPER 3 1	493	86.1	103.8	7.3	54933 DRAPER 4 138 to 54934 DRAPER 7 345 to 55721 DRAPER2113.8 CKT 2	598	See Previous Solution Specified for Facility	
04SP		OKGE	54933 DRAPER 4 138 WND 1 DRAPER 4 2	493	86.1	103.8	7.3	54933 DRAPER 4 138 to 54934 DRAPER 7 345 to 55720 DRAPER1113.8 CKT 1	598	See Previous Solution Specified for Facility	
										OKGE Project to replace breakers and switches at Memorial,	
										Replace switch at Skyline, and Reconductor the line to at least	
										1800+ Amps at OGE's expense. Estimated In-Service Date	
04SP	OKGE	OKGE	54835 MEMRIAL4 138 to 54850 SKYLINE4 138 CKT 1	287	61.6	120.9	14.2	54833 DANFRTH4 138 to 56174 OMHAFER4 138 CKT 1	635	6/1/2005. Use OKGE Redispatch as Interim Mitigation	
										OKGE Project to Increase CTR at Mustang sub at OGE's expense. Estimated In-Service Date 6/1/2005. Use OKGE Redispatch as	
04SP	OKGE	OKGE	54896 MORGAN 4 138 to 54861 MUSTANG4 138 CKT 1	287	76.1	118.4	10.1	54902 MCCLAIN4 138 to 54929 PLVALLY4 138 CKT 1	688	Interim Mitigation.	
04SP	OKGE		54835 MEMRIAL4 138 to 54850 SKYLINE4 138 CKT 1	287	56.6	115.7	14.1	54832 EASTERN4 138 to 56174 OMHAFER4 138 CKT 1	719	See Previous Solution Specified for Facility	
0.0.	ONOL	0.102	O 1000 MEMILIA 100 to 0 1000 OKY EME 1 100 OKY 1	20.	00.0			0.0002 27 0.72 144 1 100 10 00 17 1 0111 17 11 214 1 100 014 1	7.0	Reroute the existing 345kV Arcadia-Seminole line to new 345kV	
										sub bay at Horseshoe Lake sub and install two 345-138kV bus tie	
										transformers at HSL. Build 14miles of 345kV line from Redbud to	
										HSL. Will require 6-345kV breakers, 2-xfrmr, 4-138kV breakers,	
										transmission line reroute, 14miles of new 345kV line. Estimated In-	
04SP	OKGE	OKGE	54880 NORTWST7 345 WND 2 NORTWST2 1	493	79.6	108.2	11.7	54879 NORTWST4 138 to 54880 NORTWST7 345 to 55743 NORTWS2113.8 CKT 2	730	Service Date 3/1/2007	\$ 24,000,000
0.400	OKOE	OKOE	CAOZO NODTINOTA AOO MINID A NODTINOTO	400	70.0	405.0		54070 NODTINOTA 400 II. 54000 NODTINOTA 045 II. 55740 NODTINO0440 0 OUT 0	045	Delicated as least 1 December 1 to October 1 Heavening for 4000 MW	
04SP	OKGE	OKGE	54879 NORTWST4 138 WND 1 NORTWST2 1 54835 MEMRIAL4 138 to 54850 SKYLINE4 138 CKT 1	493	78.2	105.3	11.1	54879 NORTWST4 138 to 54880 NORTWST7 345 to 55743 NORTWS2113.8 CKT 2 54832 EASTERN4 138 to 54835 MEMRIAL4 138 CKT 1	815	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
04SP	UKGE	OKGE	54835 MEMRIAL4 138 to 54850 SKYLINE4 138 CKT 1	287	47.5	106.5	14.1	54832 EASTERN4 138 to 54835 MEMRIAL4 138 CKT 1	821	See Previous Solution Specified for Facility	
04SP	OKGE	OKGE	54851 QUAILCK4 138 to 54873 LONEOAK4 138 CKT 1	308	72.2	107.8	9.1	54854 BRADEN 4 138 to 54879 NORTWST4 138 CKT 1	827	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
0401	ONCE	ONCE	54001 Q0/112014 100 to 54070 2014207114 100 011 1	500	12.2	107.0	5.1	04004 BICKBER 4 100 to 04013 NOKTWOTA 100 OKT 1	027	OKGE Terminal Equipment Project underway to increase line rating.	
										Estimated In-Service Date 9/30/2004. New Emergeny Rating 308	
										MVA. Relieved or Impact Removed by Selected Upgrades for 1200	
04SP	OKGE	OKGE	54906 KAMOMEM4 138 to 54907 ARCADIA4 138 CKT 1	287	31.4	112.6	19.4	54833 DANFRTH4 138 to 54907 ARCADIA4 138 CKT 1	850	MW	
04SP	OKGE	OKGE	54851 QUAILCK4 138 to 54873 LONEOAK4 138 CKT 1	308	71.5	107.0	9.1	54852 SLVRLAK4 138 to 54854 BRADEN 4 138 CKT 1	851	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
04SP	OKGE	OKGE	54835 MEMRIAL4 138 to 54850 SKYLINE4 138 CKT 1	287	53.9	109.2	13.2	54852 SLVRLAK4 138 to 54853 DVISION4 138 CKT 1	861	See Previous Solution Specified for Facility	
										Change sw. to 2000A at czech hall. Increase trap an CTR to 2000A at cimarron sub. May require changing relays. This will bring the	·
04SP	OKGE	OKGE	54894 CZECHAL4 138 to 54898 CIMARON4 138 CKT 1	382	72.5	105.5	10.5	54902 MCCLAIN4 138 to 54929 PLVALLY4 138 CKT 1	893	Rate B to the conductor Rate B of 444MVA.	\$ 150,000
04SP		OKGE	54896 MORGAN 4 138 to 54861 MUSTANG4 138 CKT 1	287	61.7	105.8	10.5	54863 HAYMAKR4 138 to 54898 CIMARON4 138 CKT 1	901	See Previous Solution Specified for Facility	\$ 150,000
04SP	OKGE	OKGE	54896 MORGAN 4 138 to 54861 MUSTANG4 138 CKT 1	287	60.3	104.3	10.5	54853 DVISION4 138 to 54863 HAYMAKR4 138 CKT 1	923	See Previous Solution Specified for Facility	
										,	
04SP	OKGE	OKGE	54908 ARCADIA7 345 WND 2 ARCADIA2 1	493	50.2	107.8	23.7	54907 ARCADIA4 138 to 54908 ARCADIA7 345 to 55704 ARCADI2113.8 CKT 2	937	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
										OKGE Terminal Equipment Project underway to increase line rating.	
										Estimated In-Service Date 9/30/2004. New Emergeny Rating 308	
										MVA. Relieved or Impact Removed by Selected Upgrades for 1200	
04SP	OKGE	OKGE	54906 KAMOMEM4 138 to 54907 ARCADIA4 138 CKT 1	287	19.0	111.3	22.1	54880 NORTWST7 345 to 54908 ARCADIA7 345 CKT 1	941	MW	
								Multiple Contingency Outage: 54837 TENESTP4 138 to 54843 84TH ST4 138 CKT 1			
								54835 MEMRIAL4 138 to 54837 TENESTP4 138 CKT 1			
04SP	OKGE	OKGE	54870 STONWAL4 138 to 54872 REMPKTP4 138 CKT 1	191	75.7	103.7	4.5	54838 TENNESE4 138 to 54837 TENESTP4 138 CKT 1	986	Upgrade trap @ Stonewall	\$ 50,000
0.01	3.102	32	5.5.5 5.5.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.			.00.7			1		. 22,300
04SP	OKGE	OKGE	54908 ARCADIA7 345 WND 2 ARCADIA3 2	493	49.0	105.1	23.1	54907 ARCADIA4 138 to 54908 ARCADIA7 345 to 55703 ARCADI1113.8 CKT 1	1005	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
04SP	OKGE	OKGE	54907 ARCADIA4 138 WND 1 ARCADIA2 1	493	49.4	104.6	22.7	54907 ARCADIA4 138 to 54908 ARCADIA7 345 to 55704 ARCADI2113.8 CKT 2	1023	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
04SP	OKGE	OKGE	54835 MEMRIAL4 138 to 54850 SKYLINE4 138 CKT 1	287	57.7	101.7	10.5	54849 LAKESID4 138 to 54853 DVISION4 138 CKT 1	1034	See Previous Solution Specified for Facility	
0.405	OKOE	OKOE	E4000 ADCADIAZ 245 to 54000 DEDDUD Z 045 0177 0	4405	24.7	100.0	07.0	E4000 ADCADIAZ 245 to 54000 DEDBUD Z 045 047 4	1000	Delianad as Impact Demonstration October 1115 and 15 to 1000 1000	
04SP	OKGE	OKGE	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 2	1195	21.7	109.6	87.6	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 1	1066	Relieved or Impact Removed by Selected Upgrades for 1200 MW	1
04SP	OKGE	OKGE	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 1	1195	21.6	109.4	87.4	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 2	1069	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
043P	ONGE	ONGE	04000 ANOADIA7 340 to 34000 REDDOD 7 345 CKT T	1195	21.0	109.4	07.4	04500 ANOADIA1 343 IU 34308 NEDBOD 1 343 ON I Z	1009	Nelieved of impact Nellioved by Selected Opgrades 101 1200 MW	1
04SP	OKGE	OKGE	54906 KAMOMEM4 138 to 54941 HSL 4 138 CKT 1	287	20.4	103.0	19.8	54833 DANFRTH4 138 to 54907 ARCADIA4 138 CKT 1	1102	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
0.01	3.102	32	7 100 OKT 1			.00.0	.0.0	5.223 SAW (CITY 100 to 5.007 ARGAESIA) 100 ORT 1	152	The second of th	
04SP	OKGE	OKGE	54907 ARCADIA4 138 WND 1 ARCADIA3 2	493	48.1	101.9	22.1	54907 ARCADIA4 138 to 54908 ARCADIA7 345 to 55703 ARCADI1113.8 CKT 1	1125	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
04SP	OKGE	OKGE	54906 KAMOMEM4 138 to 54941 HSL 4 138 CKT 1	287	8.5	101.4	22.2	54880 NORTWST7 345 to 54908 ARCADIA7 345 CKT 1	1165		
										OKGE Terminal Equipment Project underway to increase line rating.	
										Estimated In-Service Date 12/30/2004. New Emergency Rating 308	
0:05	01/05	01/05	E40E0 01) (DI A) (4 400 to E 10E0 D) ((0) (0) (0) (0)	007	F4.0	4000	44.0	EAGOE MEMBERS A AGO IN EAGOE COM THE CASE COM	4.00	MVA. And, OKGE Planned Project to Build 138 kV line from	
04SP	OKGE	OKGE	54852 SLVRLAK4 138 to 54853 DVISION4 138 CKT 1	287	51.6	100.3	11.6	54835 MEMRIAL4 138 to 54850 SKYLINE4 138 CKT 1	1183	Piedmont to Haymaker by 12/30/04.	1
U45P	UKGE	UKGE	54870 STONWAL4 138 to 54872 REMPKTP4 138 CKT 1	191	75.3	102.7	4.4	54835 MEMRIAL4 138 to 54837 TENESTP4 138 CKT 1	1200	Invalid Contingency	1

Study	From			Rate	BC %	TC %			ATC		Estimated
Case	Area	To Area	Monitored Branch Overload	<mva></mva>	Loading	Loading	%TDF	Outaged Branch Causing Overload	(MW)	Solution	Cost
04SH	OKGE	OKGE	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 2	1195	25.2	112.0	86.4	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 1	1032	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
04SH	OKGE	OKGE	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 1	1195	25.2	111.8	86.3	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 2	1035	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
04SH	OKGE	OKGE	54835 MEMRIAL4 138 to 54850 SKYLINE4 138 CKT 1	287	70.8	101.9	7.4	54833 DANFRTH4 138 to 56174 OMHAFER4 138 CKT 1	1102	See Previous Solution Specified for Facility	
04SH	OKGE	OKGE	54906 KAMOMEM4 138 to 54907 ARCADIA4 138 CKT 1	287	40.8	101.7	14.6	54880 NORTWST7 345 to 54908 ARCADIA7 345 CKT 1	1161	OKGE Terminal Equipment Project underway to increase line rating. Estimated In-Service Date 9/30/2004. New Emergeny Rating 308 MVA. Relieved or Impact Removed by Selected Upgrades for 1200 MW OKGE Terminal Equipment Project underway to increase line rating.	
										Estimated In-Service Date 9/30/2004. New Emergeny Rating 308 MVA. Relieved or Impact Removed by Selected Upgrades for 1200	
04SH	OKGE	OKGE	54906 KAMOMEM4 138 to 54907 ARCADIA4 138 CKT 1	287	51.8	100.7	11.7	54833 DANFRTH4 138 to 54907 ARCADIA4 138 CKT 1	1180	MW	
04FA	OKGE	OKGE	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 2	1195	16.6	103.2	86.1	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 1	1156	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
04FA	OKGE	OKGE	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 1	1195	16.6	102.9	86.0	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 2	1159	Relieved or Impact Removed by Selected Upgrades for 1200 MW OKGE Terminal Equipment Project underway to increase line rating.	
04WP	OKGE	OKGE	54832 EASTERN4 138 to 54835 MEMRIAL4 138 CKT 1	191	61.9	107.4	7.2	54835 MEMRIAL4 138 to 54850 SKYLINE4 138 CKT 1	1033	Estimated In-Service Date 12/30/2004. New Emergency Rating 287 MVA	
04WP	OKGE	OKGE	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 2	1195	18.2	105.0	86.5	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 1	1131	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
04WP 05AP	OKGE	OKGE	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 1 NONE IDENTIFIED	1195	18.2	104.8	86.3 0.0	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 2	1134 1200	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
00/11			NONE IDENTIFIED				0.0		1200		
05G	OKGE	OKGE	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 2	1195	26.4	112.3	85.5	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 1	1005	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
05G	OKGE	OKGE	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 1	1195	26.3	112.0	85.4	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 2	1009	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
05G	OKGE	OKGE	54832 EASTERN4 138 to 54835 MEMRIAL4 138 CKT 1	191	38.9	104.6	10.5	54835 MEMRIAL4 138 to 54850 SKYLINE4 138 CKT 1	1054		
05G	OKGE	OKGE	54906 KAMOMEM4 138 to 54907 ARCADIA4 138 CKT 1	287	14.5	102.3	21.0	54880 NORTWST7 345 to 54908 ARCADIA7 345 CKT 1	1149	OKGE Terminal Equipment Project underway to increase line rating. Estimated In-Service Date 9/30/2004. New Emergeny Rating 308 MVA. Relieved or Impact Removed by Selected Upgrades for 1200 MW OKGE Terminal Equipment Project underway to increase line rating. Estimated In-Service Date 9/30/2004. New Emergeny Rating 308	
05G	OKGE	OKGE	54906 KAMOMEM4 138 to 54907 ARCADIA4 138 CKT 1	287	24.1	100.4	18.2	54833 DANFRTH4 138 to 54907 ARCADIA4 138 CKT 1	1188	MVA. Relieved or Impact Removed by Selected Upgrades for 1200	
05SP	OKGE		54880 NORTWST7 345 WND 2 NORTWST2 1	493	80.0	111.0	12.7	54879 NORTWST4 138 to 54880 NORTWST7 345 to 55743 NORTWS2113.8 CKT 2	705		
										, , , , , , , , , , , , , , , , , , , ,	
05SP	OKGE		54965 POSTRDT4 138 to 54993 SE15TH 4 138 CKT 1	191	58.1	102.9	7.1	54965 POSTRDT4 138 to 54994 TINKER54 138 CKT 1	723	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
05SP	OKGE		54879 NORTWST4 138 WND 1 NORTWST2 1	493	78.4	107.7	12.0	54879 NORTWST4 138 to 54880 NORTWST7 345 to 55743 NORTWS2113.8 CKT 2	791	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
05SP	OKGE	OKGE	54894 CZECHAL4 138 to 54898 CIMARON4 138 CKT 1	382	74.9	110.0	11.2	54902 MCCLAIN4 138 to 54929 PLVALLY4 138 CKT 1	858	See Previous Solution Specified for Facility	
05SP	OKGE	OKGE	54853 DVISION4 138 to 54863 HAYMAKR4 138 CKT 1	287	74.4	106.6	7.7	54894 CZECHAL4 138 to 54898 CIMARON4 138 CKT 1	871	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
05SP	OKGE	OKGE	54906 KAMOMEM4 138 to 54907 ARCADIA4 138 CKT 1	287	28.0	109.3	19.4	54833 DANFRTH4 138 to 54907 ARCADIA4 138 CKT 1	926	OKGE Terminal Equipment Project underway to increase line rating. Estimated In-Service Date 9/30/2004. New Emergeny Rating 308 MVA. Relieved or Impact Removed by Selected Upgrades for 1200 MW	
05SP	OKGE	OKGE	54908 ARCADIA7 345 WND 2 ARCADIA2 1	493	49.7	107.7	23.9	54907 ARCADIA4 138 to 54908 ARCADIA7 345 to 55704 ARCADI2113.8 CKT 2	941	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
05SP	OKGE	OKGE	54853 DVISION4 138 to 54863 HAYMAKR4 138 CKT 1	287	70.1	101.9	7.6	54893 XEROX 4 138 to 54894 CZECHAL4 138 CKT 1	956	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
05SP	OKGE	OKGE	54880 NORTWST7 345 WND 2 NORTWST3 2	493	73.2	101.7	11.7	54879 NORTWST4 138 to 54880 NORTWST7 345 to 55742 NORTWS1113.8 CKT 1	990	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
			54906 KAMOMEM4 138 to 54907 ARCADIA4 138 CKT 1	287	15.4	108.0	22.2	54880 NORTWST7 345 to 54908 ARCADIA7 345 CKT 1	999	OKGE Terminal Equipment Project underway to increase line rating. Estimated In-Service Date 9/30/2004. New Emergeny Rating 308 MVA. Relieved or Impact Removed by Selected Upgrades for 1200 MW	
05SP	OKGE	OKGE	54908 ARCADIA7 345 WND 2 ARCADIA3 2	493	48.4	105.0	23.3	54907 ARCADIA4 138 to 54908 ARCADIA7 345 to 55703 ARCADI1113.8 CKT 1	1002	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
05SP	OKGE		54907 ARCADIA4 138 WND 1 ARCADIA2 1	493	48.8	104.4	22.8	54907 ARCADIA4 138 to 54908 ARCADIA7 345 to 55704 ARCADI2113.8 CKT 2	1024		
05SP	OKGE	OKGE	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 2	1195	19.1	107.2	87.8	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 1	1099	Relieved or Impact Removed by Selected Upgrades for 1200 MW	

Study Case	From Area	To Area	Monitored Branch Overload	Rate <mva></mva>	BC % Loading	TC % Loading	%TDF	Outaged Branch Causing Overload	ATC (MW)	Solution	Estimated Cost
							87.6				Cost
05SP		OKGE	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 1	1195	19.0	107.0		54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 2	1102	, ,	
05SP	OKGE	OKGE	54907 ARCADIA4 138 WND 1 ARCADIA3 2	493	47.6	101.7	22.2	54907 ARCADIA4 138 to 54908 ARCADIA7 345 to 55703 ARCADI1113.8 CKT 1 Multiple Contingency Outage:	1131	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
								54837 TENESTP4 138 to 54843 84TH ST4 138 CKT 1 54835 MEMRIAL4 138 to 54837 TENESTP4 138 CKT 1			
05SP	OKGE	OKGE	54870 STONWAL4 138 to 54872 REMPKTP4 138 CKT 1	191	71.2	100.6	4.7	54838 TENNESE4 138 to 54837 TENESTP4 138 CKT 1	1165	See Previous Solution Specified for Facility	
05SP	OKGE	OKGE	54988 TINKER44 138 to 54990 TINKER24 138 CKT 1	100	60.7	130.8	5.8	54965 POSTRDT4 138 to 54993 SE15TH 4 138 CKT 1	1200	Not a valid Overload; Relays trip to open UG transmission line when loading reaches 100%, No problem exist with line open.	
05SH	OKGE	OKGE	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 2	1195	24.0	110.8	86.4	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 1	1049	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
05SH	OKGE	OKGE	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 1	1195	23.9	110.5	86.3	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 2	1052	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
-										OKGE Terminal Equipment Project underway to increase line rating. Estimated In-Service Date 9/30/2004. New Emergeny Rating 308	
										MVA. Relieved or Impact Removed by Selected Upgrades for 1200	
05SH	OKGE	OKGE	54906 KAMOMEM4 138 to 54907 ARCADIA4 138 CKT 1	287	53.8	102.9	11.8	54833 DANFRTH4 138 to 54907 ARCADIA4 138 CKT 1	1119	MW OKGE Terminal Equipment Project underway to increase line rating.	
										Estimated In-Service Date 9/30/2004. New Emergeny Rating 308 MVA. Relieved or Impact Removed by Selected Upgrades for 1200	
05SH	OKGE	OKGE	54906 KAMOMEM4 138 to 54907 ARCADIA4 138 CKT 1	287	42.2	103.3	14.6	54880 NORTWST7 345 to 54908 ARCADIA7 345 CKT 1	1129	MW	
05FA	OKGE	OKGE	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 2	1195	14.3	101.2	86.5	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 1	1183	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
05FA	OKGE	OKGE	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 1	1195	14.3	101.0	86.4	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 2	1186	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
05WP	OKGE	OKGE	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 2	1195	23.4	109.8	86.1	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 1	1065	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
05WP	OKGE	OKGE	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 1	1195	23.3	109.6	85.9	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 2	1067	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
07SP		OKGE	54880 NORTWST7 345 WND 2 NORTWST2 1	493	82.1	116.2	14.0	54879 NORTWST4 138 to 54880 NORTWST7 345 to 55743 NORTWS2113.8 CKT 2	636	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
07SP		OKGE	54879 NORTWST4 138 WND 1 NORTWST2 1	493	80.4	112.4	13.1	54879 NORTWST4 138 to 54880 NORTWST7 345 to 55743 NORTWS2113.8 CKT 2	718	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
07SP		OKGE OKGE	54853 DVISION4 138 to 54863 HAYMAKR4 138 CKT 1 54894 CZECHAL4 138 to 54898 CIMARON4 138 CKT 1	287 382	75.9 75.1	113.8 115.4	9.1 12.8	54894 CZECHAL4 138 to 54898 CIMARON4 138 CKT 1 54902 MCCLAIN4 138 to 54929 PLVALLY4 138 CKT 1	860 882	Relieved or Impact Removed by Selected Upgrades for 1200 MW See Previous Solution Specified for Facility	
										OKGE Terminal Equipment Project underway to increase line rating. Estimated In-Service Date 9/30/2004. New Emergeny Rating 308	
07SP	OKGE	OKGE	54906 KAMOMEM4 138 to 54907 ARCADIA4 138 CKT 1	287	27.0	113.9	20.8	54833 DANFRTH4 138 to 54907 ARCADIA4 138 CKT 1	890	MVA. Relieved or Impact Removed by Selected Upgrades for 1200 MW	
07SP		OKGE	54908 ARCADIA7 345 WND 2 ARCADIA2 1	493	50.5	112.2	25.3	54907 ARCADIA4 138 to 54908 ARCADIA7 345 to 55704 ARCADI2113.8 CKT 2	898	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
07SP	OKGE	OKGE	54880 NORTWST7 345 WND 2 NORTWST3 2	493	75.1	106.5	12.9	54879 NORTWST4 138 to 54880 NORTWST7 345 to 55742 NORTWS1113.8 CKT 1	921	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
07SP	OKGE	OKGE	54853 DVISION4 138 to 54863 HAYMAKR4 138 CKT 1	287	71.3	108.7	9.0	54893 XEROX 4 138 to 54894 CZECHAL4 138 CKT 1	948	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
07SP	OKGE	OKGE	54908 ARCADIA7 345 WND 2 ARCADIA3 2	493	49.2	109.4	24.7	54907 ARCADIA4 138 to 54908 ARCADIA7 345 to 55703 ARCADI1113.8 CKT 1	952	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
07SP	OKGE	OKGE	54907 ARCADIA4 138 WND 1 ARCADIA2 1	493	49.7	108.3	24.1	54907 ARCADIA4 138 to 54908 ARCADIA7 345 to 55704 ARCADI2113.8 CKT 2	960	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
										OKGE Terminal Equipment Project underway to increase line rating. Estimated In-Service Date 9/30/2004. New Emergeny Rating 308	
07SP	OKGE	OKGE	54906 KAMOMEM4 138 to 54907 ARCADIA4 138 CKT 1	287	13.6	111.4	23.4	54880 NORTWST7 345 to 54908 ARCADIA7 345 CKT 1	972	MVA. Relieved or Impact Removed by Selected Upgrades for 1200 MW	
07SP		OKGE			69.2	106.3	8.9	54893 XEROX 4 138 to 54896 MORGAN 4 138 CKT 1	000		
0/5P	UNGE	UNGE	54853 DVISION4 138 to 54863 HAYMAKR4 138 CKT 1	287	09.2	106.3	0.9	Multiple Contingency Outage:	909	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
								54837 TENESTP4 138 to 54843 84TH ST4 138 CKT 1 54835 MEMRIAL4 138 to 54837 TENESTP4 138 CKT 1			
07SP	OKGE	OKGE	54870 STONWAL4 138 to 54872 REMPKTP4 138 CKT 1	191	75.0	108.2	5.3	54838 TENNESE4 138 to 54837 TENESTP4 138 CKT 1	1015	See Previous Solution Specified for Facility	
07SP	OKGE	OKGE	54853 DVISION4 138 to 54863 HAYMAKR4 138 CKT 1	287	67.9	105.0	8.9	54861 MUSTANG4 138 to 54896 MORGAN 4 138 CKT 1	1025	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
07SP	OKGE	OKGE	54879 NORTWST4 138 WND 1 NORTWST3 2	493	73.6	102.9	12.0	54879 NORTWST4 138 to 54880 NORTWST7 345 to 55742 NORTWS1113.8 CKT 1	1025	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
07SP	OKGE	OKGE	54907 ARCADIA4 138 WND 1 ARCADIA3 2	493	48.4	105.5	23.5	54907 ARCADIA4 138 to 54908 ARCADIA7 345 to 55703 ARCADI1113.8 CKT 1	1028	Relieved or Impact Removed by Selected Upgrades for 1200 MW	

Study	From			Rate	BC %	TC %			ATC	T	Estimated
Case		To Area	Monitored Branch Overload	<mva></mva>	Loading	Loading	%TDF	Outaged Branch Causing Overload	(MW)	Solution	Cost
07SP	OKGE	OKGE	54894 CZECHAL4 138 to 54898 CIMARON4 138 CKT 1	382	65.0	105.7	13.0	54863 HAYMAKR4 138 to 54898 CIMARON4 138 CKT 1	1044	See Previous Solution Specified for Facility	
07SP	OKGE	OKGE	54851 QUAILCK4 138 to 54873 LONEOAK4 138 CKT 1	308	67.3	103.7	9.3	54854 BRADEN 4 138 to 54879 NORTWST4 138 CKT 1	1050	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
07SP	OKGE	OKGE	54894 CZECHAL4 138 to 54898 CIMARON4 138 CKT 1	382	63.0	105.7	13.6	54853 DVISION4 138 to 54863 HAYMAKR4 138 CKT 1	1056	See Previous Solution Specified for Facility	
										, , , , , , , , , , , , , , , , , , , ,	
07SP	OKGE	OKGE	54893 XEROX 4 138 to 54894 CZECHAL4 138 CKT 1	382	65.0	104.7	12.6	54902 MCCLAIN4 138 to 54929 PLVALLY4 138 CKT 1	1072	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
07SP	OKGE	OKGE	54851 QUAILCK4 138 to 54873 LONEOAK4 138 CKT 1	308	66.6	102.9	9.3	54852 SLVRLAK4 138 to 54854 BRADEN 4 138 CKT 1	1081	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
										7	
07SP	OKGE	OKGE	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 2	1195	17.5	106.1	88.2	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 1	1118	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
07SP	OKGE	OKGE	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 1	1195	17.4	105.8	88.0	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 2	1121	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
0.0.	ONOL	ONOL	C 1000 Filt C 10 to C 1000 NESSOS F C 10 C N 1	1100		100.0	00.0	010007110715111 010 to 01000 NESSOS 1 010 011 E		Noncrea of impact Nomeroa by Coloctea Opgradoc for 1200 initi	
07SP	OKGE	OKGE	54906 KAMOMEM4 138 to 54941 HSL 4 138 CKT 1	287	14.1	102.1	21.0	54833 DANFRTH4 138 to 54907 ARCADIA4 138 CKT 1	1146	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
07SP	OKGE	OKGE	54894 CZECHAL4 138 to 54898 CIMARON4 138 CKT 1	382	53.6	102.6	15.6	54853 DVISION4 138 to 54861 MUSTANG4 138 CKT 1	1148	See Previous Solution Specified for Facility	
07SP	OKGE	OKGE	54928 SOGATE 4 138 to 54929 PLVALLY4 138 CKT 1	287	79.1	100.2	5.0	54953 HOLLYWD4 138 to 54954 INDNHIL4 138 CKT 1	1188	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
07SP	OKGE	OKGE	54894 CZECHAL4 138 to 54898 CIMARON4 138 CKT 1	382	59.4	100.1	13.0	54928 SOGATE 4 138 to 54929 PLVALLY4 138 CKT 1	1197	See Previous Solution Specified for Facility	
07SP	OKGE	OKGE	54849 LAKESID4 138 to 54853 DVISION4 138 CKT 1	287	85.3	101.4	3.8	54835 MEMRIAL4 138 to 54837 TENESTP4 138 CKT 1	1200	Invalid Contingency	
07SP	OKGE	OKGE	54870 STONWAL4 138 to 54872 REMPKTP4 138 CKT 1	191	74.6	107.0	5.2	54835 MEMRIAL4 138 to 54837 TENESTP4 138 CKT 1	1200	Invalid Contingency	
07WP	OKGE	OKGE	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 2	1195	20.6	108.1	87.1	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 1	1088	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
										, ,	
07WP	OKGE	OKGE	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 1	1195	20.6	107.8	86.9	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 2	1091	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
10SP	OKGE	OKGE	54880 NORTWST7 345 WND 2 NORTWST2 1	493	84.4	118.4	13.9	54879 NORTWST4 138 to 54880 NORTWST7 345 to 55743 NORTWS2113.8 CKT 2	631	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
1001	ONOL	ONOL	G-GGG NGKTWGT7 G-G WKB 2 NGKTWGT2	430	04.4	110.4	10.0	3-07-3 NORTWOT4 100 to 0-000 NORTWOT7 3-0 to 007-3 NORTWOZ110.0 GRT 2	001	Relieved of Impact Removed by delected opgrades for 1200 MW	
10SP	OKGE	OKGE	54879 NORTWST4 138 WND 1 NORTWST2 1	493	82.6	114.7	13.2	54879 NORTWST4 138 to 54880 NORTWST7 345 to 55743 NORTWS2113.8 CKT 2	704	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
10SP	OKGE	OKGE	54965 POSTRDT4 138 to 54993 SE15TH 4 138 CKT 1	191	53.8	119.4	10.4	54965 POSTRDT4 138 to 54994 TINKER54 138 CKT 1	758	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
103F	ONGE	ONGE	34903 FO3TRD14 130 to 34993 3E131H 4 130 CR1 1	191	55.6	119.4	10.4	54905 FOSTRD14 136 to 54994 THRER54 136 CRT 1	730	Relieved of Impact Removed by Selected Opgrades for 1200 MW	
10SP	OKGE	OKGE	54908 ARCADIA7 345 WND 2 ARCADIA2 1	493	51.4	114.5	26.0	54907 ARCADIA4 138 to 54908 ARCADIA7 345 to 55704 ARCADI2113.8 CKT 2	901	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
10SP	OKGE	OKGE	54880 NORTWST7 345 WND 2 NORTWST3 2	493	77.3	108.5	12.8	54879 NORTWST4 138 to 54880 NORTWST7 345 to 55742 NORTWS1113.8 CKT 1	919	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
103F	ONGE	ONGE	54000 NORTWS17 545 WND 2 NORTWS15 2	493	11.3	106.5	12.0	34079 NOKTW314 130 to 34000 NOKTW317 343 to 33742 NOKTW31113.6 CKT 1	919	OKGE Terminal Equipment Project underway to increase line rating.	
										Estimated In-Service Date 9/30/2004. New Emergeny Rating 308	
										MVA. Relieved or Impact Removed by Selected Upgrades for 1200	
10SP	OKGE	OKGE	54906 KAMOMEM4 138 to 54907 ARCADIA4 138 CKT 1	287	25.7	114.3	21.2	54833 DANFRTH4 138 to 54907 ARCADIA4 138 CKT 1	942	MW	
10SP	OKGE	OKGE	54908 ARCADIA7 345 WND 2 ARCADIA3 2	493	50.1	111.7	25.3	54907 ARCADIA4 138 to 54908 ARCADIA7 345 to 55703 ARCADI1113.8 CKT 1	945	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
	ONOL	ONOL	O TOOO ATTOCKER OF THE EAST OF	100	00.1		20.0		0.0	Nonerod of Impact Nonerod by Colocted Opgicado for 1200 MM	
10SP	OKGE	OKGE	54965 POSTRDT4 138 to 54993 SE15TH 4 138 CKT 1	191	65.3	106.6	6.6	54990 TINKER24 138 to 54994 TINKER54 138 CKT 1	948	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
10SP	OKGE	OKGE	54907 ARCADIA4 138 WND 1 ARCADIA2 1	493	50.5	110.7	24.7	54907 ARCADIA4 138 to 54908 ARCADIA7 345 to 55704 ARCADI2113.8 CKT 2	954	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
1001	OROL	OROL	04307 ANONDINA 130 WIND 17 MONDING	430	50.5	110.7	24.1	04301 / INO/IDINA 130 to 04300 / INO/IDINA 043 to 30704 / INO/IDIZ 113.0 ONA 2	304	Noneyed of Impact Nemoved by deletica opgrades for 1200 MW	
10SP	OKGE	OKGE	54907 ARCADIA4 138 WND 1 ARCADIA3 2	493	49.2	107.8	24.1	54907 ARCADIA4 138 to 54908 ARCADIA7 345 to 55703 ARCADI1113.8 CKT 1	1005	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
										OKGE Terminal Equipment Project underway to increase line rating. Estimated In-Service Date 9/30/2004. New Emergeny Rating 308	
										MVA. Relieved or Impact Removed by Selected Upgrades for 1200	
10SP	OKGE	OKGE	54906 KAMOMEM4 138 to 54907 ARCADIA4 138 CKT 1	287	10.4	110.4	23.9	54880 NORTWST7 345 to 54908 ARCADIA7 345 CKT 1	1010	MW	
10SP	OKGE	OKGE	54853 DVISION4 138 to 54863 HAYMAKR4 138 CKT 1	287	74.6	110.5	8.6	54894 CZECHAL4 138 to 54898 CIMARON4 138 CKT 1	1019	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
10SP	OKGE	OKGE	54879 NORTWST4 138 WND 1 NORTWST3 2	493	75.7	105.0	12.1	54879 NORTWST4 138 to 54880 NORTWST7 345 to 55742 NORTWS1113.8 CKT 1	1030	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
10SP	OKGE	OKGE	54894 CZECHAL4 138 to 54898 CIMARON4 138 CKT 1	382	73.3	111.6	12.2	54902 MCCLAIN4 138 to 54929 PLVALLY4 138 CKT 1	1040	See Previous Solution Specified for Facility	
10SP	OKGE	OKGE	54853 DVISION4 138 to 54863 HAYMAKR4 138 CKT 1	287	69.7	105.3	8.5	54893 XEROX 4 138 to 54894 CZECHAL4 138 CKT 1	1108	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
10SP	OKGE	OKGE	54851 QUAILCK4 138 to 54873 LONEOAK4 138 CKT 1	308	66.5	102.2	9.2	54854 BRADEN 4 138 to 54879 NORTWST4 138 CKT 1	1138	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
										, ,	
10SP	OKGE	OKGE	54853 DVISION4 138 to 54863 HAYMAKR4 138 CKT 1	287	67.5	102.8	8.5	54893 XEROX 4 138 to 54896 MORGAN 4 138 CKT 1	1151	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
10SP	OKGE	OKGE	54851 QUAILCK4 138 to 54873 LONEOAK4 138 CKT 1	308	65.7	101.4	9.2	54852 SLVRLAK4 138 to 54854 BRADEN 4 138 CKT 1	1161	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
10SP	OKGE	OKGE	54853 DVISION4 138 to 54863 HAYMAKR4 138 CKT 1	287	66.2	101.5	8.4	54861 MUSTANG4 138 to 54896 MORGAN 4 138 CKT 1	1174	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
10SP	OKGE	OKGE	54894 CZECHAL4 138 to 54898 CIMARON4 138 CKT 1	382	63.3	101.8	12.3	54863 HAYMAKR4 138 to 54898 CIMARON4 138 CKT 1	1176	See Previous Solution Specified for Facility	

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Study				Rate	BC %	TC %		AT	ATC		Estimated
Case	Area	To Area	Monitored Branch Overload	<mva></mva>	Loading	Loading	%TDF	Outaged Branch Causing Overload (M)	ИW)	Solution	Cost
10SP	OKGE	OKGE	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 2	1195	13.3	101.7	88.0	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 1 11	177	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
	OKGE		54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 1	1195	13.2	101.5	87.9		180	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
10SP	OKGE	OKGE	54894 CZECHAL4 138 to 54898 CIMARON4 138 CKT 1	382	61.0	101.3	12.8	54853 DVISION4 138 to 54863 HAYMAKR4 138 CKT 1 113	182	See Previous Solution Specified for Facility	
10SP	OKGE	OKGE	54906 KAMOMEM4 138 to 54941 HSL 4 138 CKT 1	287	10.9	100.5	21.4	54833 DANFRTH4 138 to 54907 ARCADIA4 138 CKT 1 11	188	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
10SP	OKGE	OKGE	54893 XEROX 4 138 to 54894 CZECHAL4 138 CKT 1	382	62.6	100.5	12.1	54902 MCCLAIN4 138 to 54929 PLVALLY4 138 CKT 1 11:	193	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
10SP	OKGE	OKGE	55044 SEMINOL4 138 to 55055 MAUD 4 138 CKT 2	287	76.6	101.1	5.9	55044 SEMINOL4 138 to 55055 MAUD 4 138 CKT 1 11:		Relieved or Impact Removed by Selected Upgrades for 1200 MW	
10SP	OKGE	OKGE	54988 TINKER44 138 to 54990 TINKER24 138 CKT 1	100	95.7	153.4	4.8	54965 POSTRDT4 138 to 54993 SE15TH 4 138 CKT 1 12	200	Not a valid Overload; Relays trip to open UG transmission line when loading reaches 100%, No problem exist with line open.	
10WP	OKGE	OKGE	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 2	1195	20.4	105.7	84.9	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 1 11:	121	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
10WP	OKGE	OKGE	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 1	1195	20.4	105.4	84.7	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 2 11:		Relieved or Impact Removed by Selected Upgrades for 1200 MW	
										OKGE Terminal Equipment Project underway to increase line rating. Estimated In-Service Date 9/30/2004. New Emergeny Rating 308 MVA. Relieved or Impact Removed by Selected Upgrades for 1200	
10WP	OKGE	OKGE	54906 KAMOMEM4 138 to 54907 ARCADIA4 138 CKT 1	287	29.5	100.7	17.0	54880 NORTWST7 345 to 54908 ARCADIA7 345 CKT 1 118	184	MW	
										Total Estimated Engineering and Construction Cost	\$ 24,200,000

SPP-2003-271-2 Table 3.1a - Modeling Representation for Table 3.1 Includes Bus Numbers and Bus Names

					BC Without	BC With	TC Without	TC With			
Study	From			Rate	Upgrades	Upgrades	Upgrades	Upgrades			Estimated
Case	Area	To Area	Monitored Branch Overload	<mva></mva>	%Loading	%Loading	%Loading	%Loading	Outaged Branch Causing Overload	Solution	Cost
05AP			NONE IDENTIFIED								
05G			NONE IDENTIFIED								
05SH			NONE IDENTIFIED								
05FA			NONE IDENTIFIED								
07SP			NONE IDENTIFIED								
07WP			NONE IDENTIFIED								
10SP			NONE IDENTIFIED								
10WP			NONE IDENTIFIED								
										Total Estimated Engineering and Construction Cost	\$ -

Description Company					1					1		
Control Cont	Study	From			Rate	BC %	TC %			ATC		Estimated
Color Colo	Case	Area	To Area	Monitored Branch Overload	<mva></mva>	Loading	Loading	%TDF	Outaged Branch Causing Overload	(MW)	Solution	Cost
Comp. Comp	04SP				493						See Previous Solution Specified for Facility in Table 1.1	
Color Color Color Color Color Mean Number Color Mean Number Color Color Color Color Mean Number Color Co												
CREST CRES												ļ
Color Colo												
ORD												
CASE CASE CASE CASE CASE CUALICAT 18 to SARTS LONGLANK 198 COT 100 170 171	04SP	OKGE	OKGE	54933 DRAPER 4 138 WND 1 DRAPER 4 2	493	84.4	102.3	7.4	54933 DRAPER 4 138 to 54934 DRAPER 7 345 to 55720 DRAPER1113.8 CKT 1	662	See Previous Solution Specified for Facility in Table 1.1	
CASE CASE CASE CASE CASE CUALICAT 18 to SARTS LONGLANK 198 COT 100 170 171	0460	OKCE	OKCE	E4000 NORTWETT 24E WND 2 NORTWET2 4	402	90.2	100 0	110	E4070 NIODTINGT4 120 to E4000 NIODTINGT7 245 to EE742 NIODTING2112 0 CKT 2	707	Policy and or Impact Removed by Salacted Lingrades for 1200 MW	
SEP COCC COCC SERIES MEMBRIAL I SIN DESIGN SWITTER I SID CT 207 73 113.4 13.3 5.6652 SUPERAL SIN DESIGN SWITTER I SID CT 177. SEP Provides Subtract Symbol Switter Switch Swit	0401	ONGL	ONGL	34800 NORTWST7 343 WIND 2 NORTWST2	433	00.2	100.5	11.0	34079 NOINTWOTH 130 to 34000 NOINTWOTT 343 to 33743 NOINTWOZT 13.0 CNT 2	101	Relieved of Impact Removed by Selected Opgrades for 1200 MW	
SEP COCC COCC SERIES MEMBRIAL I SIN DESIGN SWITTER I SID CT 207 73 113.4 13.3 5.6652 SUPERAL SIN DESIGN SWITTER I SID CT 177. SEP Provides Subtract Symbol Switter Switch Swit	04SP	OKGE	OKGE	54851 OHAII CK4 138 to 54873 LONEOAK4 138 CKT 1	308	74.5	110.5	92	54854 BRADEN 4 138 to 54879 NORTWST4 138 CKT 1	757	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
Sept OKGE OKGE Sept												1
OSE OSC OSC OSC SABO KANDMEMA 138 D-5807 ARCADIA 138 CTT 297 34.4 116.2 19.6 54833 DANFRTHA 138 D-5807 ARCADIA 138 CTT 762 763 764												1
Color Colo	04SP	OKGE	OKGE	54851 QUAILCK4 138 to 54873 LONEOAK4 138 CKT 1	308	73.7	109.7	9.2	54852 SLVRLAK4 138 to 54854 BRADEN 4 138 CKT 1	778	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
ASP OKGE OKGE S4606 KAMOMEMI 138 IS 54807 ARCADIAL 138 CKT 277 34.4 116.2 116.5 54833 BANFETTH 138 IS 54807 ARCADIAL 138 CKT 727 723 723 724 724 725												
ORSP OKCE SERVER NAME 138 B SERVI ARCADIAL 138 CRT 27 34 116.2 10.6 SESSIO DATE NAME 138 CRT 127 776 Relieved or Impact Removed by Selected Ligoration for 1200 MW 10.5												
OKE OKCE OKCE S407 NORT WOTA 138 MND 1 NORTWIST 1 450 78.8 10.6 11.2 5407 NORTWIST 138 to \$4800 NORTWIST 138 to \$4800 NORTWIST 138 CKT 2 77.8 Releved or Impact Removed by Selected Upgrades for 1200 MW 1.6											MVA. Relieved or Impact Removed by Selected Upgrades for 1200	
ORSP ORCE ORCE ORCE ORCE S4896 MOREMAN 138 to \$4896 SWITCH 138 OKT 1 78 70 70 70 70 70 70 70	04SP	OKGE	OKGE	54906 KAMOMEM4 138 to 54907 ARCADIA4 138 CKT 1	287	34.4	116.2	19.6	54833 DANFRTH4 138 to 54907 ARCADIA4 138 CKT 1	782	MW	
ORSP ORCE ORCE ORCE ORCE S4896 MOREMAN 138 to \$4896 SWITCH 138 OKT 1 78 70 70 70 70 70 70 70]			1			1				1 7
OKSE OKGE S4835 MEMRIAL4 138 to \$4850 MEMBIAL4 138 to \$4850												
OKSP OKGE OKGE 54806 KAMOMEM4 138 to 54807 KACADIA4 138 CKT 1 227 23.9 116.6 22.2 54808 NORTWISTT 245 to 54908 ARCADIA7 345 CKT 1 38 MVA. Releved or impact Removed by Selected Upgrades for 1200 MVA. Releved or impact												
Estimated In-Service Date 90/2004. New Emergeny Rating 308 M/A. Releved or Impact Removed by Selected Upgrades for 1200 M/A. Releved or Impact Removed	04SP	OKGE	OKGE	54835 MEMRIAL4 138 to 54850 SKYLINE4 138 CK I 1	287	50.8	110.1	14.2	54832 EASTERN4 138 to 54835 MEMRIAL4 138 CKT 1	820		
MAR Releved or Impact Removed by Selected Upgrades for 1200												
OKCE OKCE S4906 KAMOMEMM 138 to 54907 ARCADIAN 138 CKT 1 227 239 116.6 22.2 54880 NORTINISTT 345 to 54908 ARCADIAN 345 CKT 1 24.5 54880 NORTINISTT 345 to 54908 ARCADIAN 345 CKT 1 24.5 54880 NORTINISTT 345 to 54908 ARCADIAN 345 to 54909 ARCADIAN 350 CKT 1 24.5 54880 NORTINIST 345 to 54909 ARCADIAN 345 to												
Major Contingency Outsign: S483 TENESTRA 138 DESIGN SHARP SHAR	0460	OKCE	OKCE	E4006 KAMOMEM4 139 to E4007 ABCADIA4 139 CKT 1	207	22.0	1166	22.2	E4890 NORTINGT7 345 to E4009 ARCADIA7 345 CKT 1	020		
Sept Character Sept Se	U43F	ONGE	ONGE	54900 KAMOMEM4 138 to 54907 ARCADIA4 138 CKT 1	201	23.9	110.0	22.2		030	IVIVV	+
Sep OKCE OKCE S4870 STONNVAL 138 to 54887 EMPKTP4 138 CKT 1 191 81,9 110.2 4.5 54383 MEMRIAL 138 to 54837 TENESTP 138 CKT 1 644 Sep Pervious Solution Specified for Facility in Table 1.1 10459 OKCE CKGE 54908 ARCADUAT 345 to 54909 REDBUD 7 345 CKT 2 19.5 32.9 12.0 87.7 54908 ARCADUAT 345 to 54909 REDBUD 7 345 CKT 2 19.5 86leved of Impact Removed by Selected Upgrades for 1200 MW												
0.65F) OKCE 0KGE 54905 ELYRLAKH 138 to 54807 SECONWAL 4138 to 54808 OKCE 1 4805												
GASP OKGE OKGE 54893 RACQNA7 345 to 54909 REDBUD 7 345 CKT 287	04SP	OKGE	OKGE	54870 STONWAL4 138 to 54872 REMPKTP4 138 CKT 1	191	81.9	110.2	4.5		864	See Previous Solution Specified for Facility in Table 1.1	
GRSP OKGE S4908 ARCADIA7 345 WND 2 ARCADIA2 1												1
OKSP OKGE	04SP	OKGE	OKGE	54908 ARCADIA7 345 WND 2 ARCADIA2 1	493	51.5	109.6	23.9	54907 ARCADIA4 138 to 54908 ARCADIA7 345 to 55704 ARCADI2113.8 CKT 2	891		
OKSP OKGE												
OKSP OKGE OKGE S4906 KAMOMEM4 138 to 54941 HSL 4 138 CKT 1 287 26.3 109.2 19.8 54833 DANFTH4 138 to 54907 ARCADIA4 138 CKT 1 927 Relieved or Impact Removed by Selected Upgrades for 1200 MW OKSP OKGE OKGE 54908 ARCADIA7 345 WND 2 ARCADIA3 2 493 50.2 106.9 23.3 54907 ARCADIA4 138 to 54903 ARCADIA7 345 to 55703 ARCADIA138 CKT 1 938 Relieved or Impact Removed by Selected Upgrades for 1200 MW OKSP OKGE OKGE 54908 ARCADIA7 345 WND 1 ARCADIA2 2 493 50.2 106.9 23.3 54907 ARCADIA4 138 to 54908 ARCADIA7 345 to 55703 ARCADIA138 CKT 1 958 Relieved or Impact Removed by Selected Upgrades for 1200 MW OKSP OKGE OKGE 54906 KAMOMEM4 138 to 54908 ARCADIA7 345 to 55704 ARCADIA7 345 to 55704 ARCADIA138 CKT 1 974 See Previous Solution Specified for Facility in Table 1.1 OKSP OKGE OKGE 54906 KAMOMEM4 138 to 54908 ARCADIA7 345 to 54908 ARCADIA7 345 CKT 1 974 See Previous Solution Specified for Facility in Table 1.1 OKSP OKGE OKGE 54906 KAMOMEM4 138 to 54908 SEE MARKEN 138 to 54908 ARCADIA7 345 to 54909 REDBUO 7 345 CKT 1 1006 SEE Previous Solution Specified for Facility in Table 1.1 OKSP OKGE OKGE 54907 ARCADIA4 138 WND 1 ARCADIA3 2 493 49.3	04SP	OKGE	OKGE	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 2	1195	32.9	121.0	87.7	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 1	912	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
OKSP OKGE OKGE S4906 KAMOMEM4 138 to 54941 HSL 4 138 CKT 1 287 26.3 109.2 19.8 54833 DANFTH4 138 to 54907 ARCADIA4 138 CKT 1 927 Relieved or Impact Removed by Selected Upgrades for 1200 MW OKSP OKGE OKGE 54908 ARCADIA7 345 WND 2 ARCADIA3 2 493 50.2 106.9 23.3 54907 ARCADIA4 138 to 54903 ARCADIA7 345 to 55703 ARCADIA138 CKT 1 938 Relieved or Impact Removed by Selected Upgrades for 1200 MW OKSP OKGE OKGE 54908 ARCADIA7 345 WND 1 ARCADIA2 2 493 50.2 106.9 23.3 54907 ARCADIA4 138 to 54908 ARCADIA7 345 to 55703 ARCADIA138 CKT 1 958 Relieved or Impact Removed by Selected Upgrades for 1200 MW OKSP OKGE OKGE 54906 KAMOMEM4 138 to 54908 ARCADIA7 345 to 55704 ARCADIA7 345 to 55704 ARCADIA138 CKT 1 974 See Previous Solution Specified for Facility in Table 1.1 OKSP OKGE OKGE 54906 KAMOMEM4 138 to 54908 ARCADIA7 345 to 54908 ARCADIA7 345 CKT 1 974 See Previous Solution Specified for Facility in Table 1.1 OKSP OKGE OKGE 54906 KAMOMEM4 138 to 54908 SEE MARKEN 138 to 54908 ARCADIA7 345 to 54909 REDBUO 7 345 CKT 1 1006 SEE Previous Solution Specified for Facility in Table 1.1 OKSP OKGE OKGE 54907 ARCADIA4 138 WND 1 ARCADIA3 2 493 49.3												
ASP OKGE OKGE OKGE S4852 SLVRLAK4 138 to 54853 DVISION4 138 CKT 1 287 58.5 107.4 11.7 54835 MEMRIAL4 138 to 54905 SKYLINE4 138 CKT 1 933 See Previous Solution Specified for Facility in Table 1.1	04SP	OKGE	OKGE	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 1	1195	32.8	120.7	87.6	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 2	915	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
ASP OKGE OKGE OKGE S4852 SLVRLAK4 138 to 54853 DVISION4 138 CKT 1 287 58.5 107.4 11.7 54835 MEMRIAL4 138 to 54905 SKYLINE4 138 CKT 1 933 See Previous Solution Specified for Facility in Table 1.1		01/05	01/05	=					5.000 BANEDTHA .000 - 5.000 ABOA BAA .000 BAT .		B	
OKGE OKGE S4908 ARCADIA7 345 WND 2 ARCADIA3 2 493 50.2 106.9 23.3 54907 ARCADIA4 138 to 54908 ARCADIA7 345 to 55703 ARCADIA113.8 CKT 1 958 Relieved or Impact Removed by Selected Upgrades for 1200 MW 04SP OKGE OKGE 54907 ARCADIA4 138 WND 1 ARCADIA2 1 493 50.6 106.1 22.8 54907 ARCADIA4 138 to 54908 ARCADIA7 345 to 55704 ARCADIA7 345 to 55704 ARCADIA13.8 CKT 2 974 See Previous Solution Specified for Facility in Table 1.1 04SP OKGE OKGE 54908 ARCADIA7 345 to 55703 ARCADIA113.8 CKT 1 106.7 10												
ASP OKGE OKGE OKGE S4907 ARCADIA4 138 WND 1 ARCADIA2 1	045P	OKGE	OKGE	54852 SLVRLAR4 138 to 54853 DVISION4 138 CKT 1	287	58.5	107.4	11.7	54835 MEMRIAL4 138 to 54850 SKYLINE4 138 CKT 1	933	See Previous Solution Specified for Facility in Table 1.1	-
ASP OKGE OKGE OKGE S4907 ARCADIA4 138 WND 1 ARCADIA2 1	0480	OKCE	OKCE	54008 APCADIA7 345 WND 2 APCADIA3 2	403	50.2	106.0	23.3	54007 APCADIA4 138 to 54008 APCADIA7 345 to 55703 APCADI4113 8 CKT 1	058	Paliaved or Impact Removed by Salected Ungrades for 1200 MW	
AdSP OKGE OKGE OKGE S4908 KAMOMEM4 138 to 549941 HSL 4 138 CKT 1 287 16.5 109.4 22.2 54880 NORTWSTT 345 to 54908 ARCADIA7 345 CKT 1 976 See Previous Solution Specified for Facility in Table 1.1 OASP OKGE												1
DASP OKGE OKGE SA894 CZECHAL4 138 to 54898 CIMARONA 138 CKT 1 382 68.2 101.5 10.6 54902 MCCLAINM 138 to 54892 PLVALLY4 138 CKT 1 976 See Previous Solution Specified for Facility in Table 1.1	0401	JILOL	JILOL	S.CC. ARGADIA TOO WILD TARGADIAZ	730	50.0	100.1	22.0	3.337 / INS. ISBN 1 100 to 01000 / ING/ISBN 010 to 00/04 / ING/ISBN 100/10	514	200 1 101.000 Column Opcomed for Facility in Fable 1.1	\vdash
DASP OKGE OKGE SA894 CZECHAL4 138 to 54898 CIMARONA 138 CKT 1 382 68.2 101.5 10.6 54902 MCCLAINM 138 to 54892 PLVALLY4 138 CKT 1 976 See Previous Solution Specified for Facility in Table 1.1	04SP	OKGE	OKGE	54906 KAMOMEM4 138 to 54941 HSL 4 138 CKT 1	287	16.5	109.4	22.2	54880 NORTWST7 345 to 54908 ARCADIA7 345 CKT 1	974	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
ASP OKGE OKGE 54833 MEMRIAL4 138 to 54850 SKYLINE4 138 CKT 1 287 57.9 102.3 10.6 54894 LAKESIDA 138 to 54853 DVISIONA 138 CKT 1 990 See Previous Solution Specified for Facility in Table 1.1												
04SP OKGE OKGE 54907 ARCADIA4 138 WND 1 ARCADIA3 2 493 49.3 103.3 22.2 54907 ARCADIA4 138 to 54908 ARCADIA7 345 to 55703 ARCADI1113.8 CKT 1 1067 Relieved or Impact Removed by Selected Upgrades for 1200 MW Multiple Contingency Outage: 54837 TENESTP4 138 to 54843 84TH ST4 138 CKT 1 54838 TENNESTP4 138 to 54837 TENESTP4 138 CKT 1 04SP OKGE OKGE 54852 SLVRLAK4 138 to 54853 DVISION4 138 CKT 1 287 65.4 101.9 8.7 54835 MEMRIAL4 138 to 54853 TENESTP4 138 CKT 1 04SP OKGE OKGE 54850 NORTWST7 345 WND 2 NORTWST3 2 493 73.8 100.4 10.9 54879 NORTWST4 138 to 54850 NORTWST7 345 to 55742 NORTWST113.8 CKT 1 1200 Invalid Contingency 04SP OKGE OKGE 54852 SLVRLAK4 138 to 54853 DVISION4 138 CKT 1 191 81.5 109.2 4.4 54835 MEMRIAL4 138 to 54837 TENESTP4 138 CKT 1 1200 Invalid Contingency 04SP OKGE OKGE 54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 2 1195 36.2 122.8 86.2 54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 2 883 Relieved or Impact Removed by Selected Upgrades for 1200 MW 04SP OKGE OKGE 54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 1 1195 36.2 122.8 86.2 54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 2 883 Relieved or Impact Removed by Selected Upgrades for 1200 MW 04SP OKGE OKGE 54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 1 1195 36.2 122.8 86.2 54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 2 883 Relieved or Impact Removed by Selected Upgrades for 1200 MW			OKGE							000		
Multiple Contingency Outage: 54837 TENESTP4 138 to 54843 84TH ST4 138 CKT 1 54837 TENESTP4 138 to 54843 84TH ST4 138 CKT 1 54837 TENESTP4 138 CKT 1 54838 TENNESE4 138 to 54837 TENESTP4 138 CKT 1 04SP OKGE OMPA 54832 EASTERN4 138 to 54853 DVISION4 138 CKT 1 04SP OKGE OKGE 54860 NORTWST7 345 WND 2 NORTWST3 2 493 73.8 100.4 10.9 54879 NORTWST4 138 to 54850 NORTWST7 345 to 55742 NORTWST113.8 CKT 1 04SP OKGE OKGE 54860 NORTWST7 345 WND 2 NORTWST3 2 493 73.8 100.4 10.9 54879 NORTWST4 138 to 54850 NORTWST7 345 to 55742 NORTWST113.8 CKT 1 04SP OKGE OKGE 54860 SURLAK4 138 to 54853 DVISION4 138 CKT 1 04SP OKGE OKGE 54852 SLVRLAK4 138 to 54853 DVISION4 138 CKT 1 04SP OKGE OKGE 54852 SLVRLAK4 138 to 54853 DVISION4 138 CKT 1 04SP OKGE OKGE 54852 SLVRLAK4 138 to 54853 DVISION4 138 CKT 1 04SP OKGE OKGE 54852 SLVRLAK4 138 to 54853 DVISION4 138 CKT 1 04SP OKGE OKGE 54852 SLVRLAK4 138 to 54853 DVISION4 138 CKT 1 04SP OKGE OKGE 54852 SLVRLAK4 138 to 54853 DVISION4 138 CKT 1 04SP OKGE OKGE 54852 SLVRLAK4 138 to 54853 DVISION4 138 CKT 1 04SP OKGE OKGE 54852 SLVRLAK4 138 to 54853 DVISION4 138 CKT 1 04SP OKGE OKGE 54852 SLVRLAK4 138 to 54853 DVISION4 138 CKT 1 04SP OKGE OKGE 54852 SLVRLAK4 138 to 54853 DVISION4 138 CKT 1 04SP OKGE OKGE 54852 SLVRLAK4 138 to 54853 DVISION4 138 CKT 1 04SP OKGE OKGE 54852 SLVRLAK4 138 to 54853 DVISION4 138 CKT 1 04SP OKGE OKGE 54852 SLVRLAK4 138 to 54853 DVISION4 138 CKT 1 191 81.5 109.2 4.4 54835 MEMRIAL4 138 to 54837 TENESTP4 138 CKT 1 1200 Invalid Contingency 04SP OKGE OKGE 54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 2 195 36.3 123.1 86.4 54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 2 880 Relieved or Impact Removed by Selected Upgrades for 1200 MW 04SP OKGE OKGE 54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 1 1195 36.2 122.8 86.2 54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 2 883 Relieved or Impact Removed by Selected Upgrades for 1200 MW	04SP	OKGE	OKGE	54852 SLVRLAK4 138 to 54853 DVISION4 138 CKT 1	287	58.9	102.5	10.4	54850 SKYLINE4 138 to 54851 QUAILCK4 138 CKT 1	1038	See Previous Solution Specified for Facility in Table 1.1	
Multiple Contingency Outage: 54837 TENESTP4 138 to 54837 TENESTP4 138 to 54837 TENESTP4 138 CKT 1 54837 TENESTP4 138 to 54837 TENESTP4 138 CKT 1 54838 TENNESE4 138 to 54837 TENESTP4 138 CKT 1 54838 TENNESE4 138 to 54837 TENESTP4 138 CKT 1 04SP OKGE OMPA 54832 EASTERN4 138 to 56174 OMHAFER4 138 CKT 1 04SP OKGE OKGE 54880 NORTWST7 345 WND 2 NORTWST3 2 493 73.8 100.4 10.9 54879 NORTWST4 138 to 54850 SKYLINE4 138 CKT 1 04SP OKGE OKGE 54880 NORTWST7 345 WND 2 NORTWST3 2 493 73.8 100.4 10.9 54879 NORTWST4 138 to 54850 NORTWST7 345 to 55742 NORTWST1113.8 CKT 1 04SP OKGE OKGE 54880 NORTWST7 345 WND 2 NORTWST3 2 493 73.8 100.4 10.9 54879 NORTWST4 138 to 54850 NORTWST7 345 to 55742 NORTWST1113.8 CKT 1 04SP OKGE OKGE 54852 SLVRLAK4 138 to 54853 DVISION4 138 CKT 1 04SP OKGE OKGE 54852 SLVRLAK4 138 to 54853 DVISION4 138 CKT 1 04SP OKGE OKGE 54850 STONWAL4 138 to 54853 DVISION4 138 CKT 1 191 81.5 109.2 4.4 54835 MEMRIAL4 138 to 54837 TENESTP4 138 CKT 1 1200 Invalid Contingency 04SH OKGE OKGE 54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 2 1195 36.3 123.1 86.4 54908 ARCADIA7 345 CKT 2 880 Relieved or Impact Removed by Selected Upgrades for 1200 MW 04SH OKGE OKGE 54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 1 1196 36.2 122.8 86.2 54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 2 883 Relieved or Impact Removed by Selected Upgrades for 1200 MW												
54837 TENESTP4 138 to 54843 84TH ŠT4 138 CKT 1 54835 MEMRIAL4 138 to 54837 TENESTP4 138 CKT 1 54835 MEMRIAL4 138 to 54837 TENESTP4 138 CKT 1 1085 See Previous Solution Specified for Facility in Table 1.1	04SP	OKGE	OKGE	54907 ARCADIA4 138 WND 1 ARCADIA3 2	493	49.3	103.3	22.2		1067	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
OKSP OKGE OKGE S4852 SLVRLAK4 138 to 54853 DVISION4 138 CKT 1 287 65.4 101.9 8.7 54835 MEMRIAL4 138 to 54837 TENESTP4 138 CKT 1 1085 See Previous Solution Specified for Facility in Table 1.1 04SP OKGE OMPA 54832 EASTERN4 138 to 56174 OMHAFER4 138 CKT 1 287 52.8 101.9 11.7 54835 MEMRIAL4 138 to 54850 SKYLINE4 138 CKT 1 1094 Relieved or Impact Removed by Selected Upgrades for 1200 MW 04SP OKGE OKGE 54880 NORTWST7 345 WND 2 NORTWST3 2 493 73.8 100.4 10.9 54879 NORTWST4 138 to 54880 NORTWST7 345 to 55742 NORTWST1113.8 CKT 1 1134 Relieved or Impact Removed by Selected Upgrades for 1200 MW 04SP OKGE OKGE 54852 SLVRLAK4 138 to 54853 DVISION4 138 CKT 1 287 65.7 102.8 8.9 54835 MEMRIAL4 138 to 54837 TENESTP4 138 CKT 1 1200 Invalid Contingency 04SP OKGE OKGE 54870 STONWAL4 138 to 54872 REMPKTP4 138 CKT 1 191 81.5 109.2 4.4 54835 MEMRIAL4 138 to 54837 TENESTP4 138 CKT 1 1200 Invalid Contingency 04SH OKGE OKGE 54908 ARCADIA					l			l				
04SP OKGE OKGE 54852 SLVRLAK4 138 to 54853 DVISION4 138 CKT 1 287 65.4 101.9 8.7 54838 TENNESE4 138 to 54837 TENESTP4 138 CKT 1 1085 See Previous Solution Specified for Facility in Table 1.1 04SP OKGE OMPA 54832 EASTERN4 138 to 56174 OMHAFER4 138 CKT 1 287 52.8 101.9 11.7 54835 MEMRIAL4 138 to 54850 SKYLINE4 138 CKT 1 1094 Relieved or Impact Removed by Selected Upgrades for 1200 MW 04SP OKGE OKGE 54880 NORTWST7 345 WND 2 NORTWST3 2 493 73.8 100.4 10.9 54879 NORTWST4 138 to 54880 NORTWST7 345 to 55742 NORTWS1113.8 CKT 1 1134 Relieved or Impact Removed by Selected Upgrades for 1200 MW 04SP OKGE 54852 SLVRLAK4 138 to 54853 DVISION4 138 CKT 1 287 65.7 102.8 8.9 54835 MEMRIAL4 138 to 54837 TENESTP4 138 CKT 1 1200 Invalid Contingency 04SP OKGE 54862 SLVRLAK4 138 to 54870 STONWAL4 138 to 54872 REMPKTP4 138 CKT 1 191 81.5 109.2 4.4 54835 MEMRIAL4 138 to 54837 TENESTP4 138 CKT 1 1200 Invalid Contingency 04SH OKGE 54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 2					l			l				
04SP OKGE OMPA 54832 EASTERN4 138 to 56174 OMHAFER4 138 CKT 1 287 52.8 101.9 11.7 54835 MEMRIAL4 138 to 54850 SKYLINE4 138 CKT 1 1094 Relieved or Impact Removed by Selected Upgrades for 1200 MW 04SP OKGE OKGE 54880 NORTWSTT 345 WND 2 NORTWST3 2 493 73.8 100.4 10.9 54879 NORTWST4 138 to 54880 NORTWST7 345 to 55742 NORTWS1113.8 CKT 1 1134 Relieved or Impact Removed by Selected Upgrades for 1200 MW 04SP OKGE 54852 SLVRLAK4 138 to 54852 SLVRLAK4 138 to 54852 SLVRLAK4 138 to 54852 SLVRLAK4 138 to 54872 REMPKTP4 138 CKT 1 1200 Invalid Contingency 04SP OKGE OKGE 54870 STONWAL4 138 to 54872 REMPKTP4 138 CKT 1 191 81.5 109.2 4.4 54835 MEMRIAL4 138 to 54837 TENESTP4 138 CKT 1 1200 Invalid Contingency 04SH OKGE OKGE 54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 2 1195 36.3 123.1 86.4 54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 2 883 Relieved or Impact Removed by Selected Upgrades for 1200 MW	0.405	OKOE	OKOE	E40E0 01 VIDLAK4 400 to E40E0 DVIIOION (100 01/7 1	007	05.4	404.6			4005	One Devidence On bother One office of the Free White To T. C. C.	
04SP OKGE	U45P	UKGE	UKGE	04002 SEVREAR4 138 to 54853 DVISION4 138 CKT 1	287	65.4	101.9	8.7	54838 FENNESE4 138 to 54837 TENESTP4 138 CKT 1	1085	See Previous Solution Specified for Facility in Table 1.1	\vdash
04SP OKGE	04SP	OKGE	OMPA	54832 FASTERNA 138 to 56174 OMHAFERA 138 CKT 1	287	52.8	101.0	117	54835 MEMRIAL 4 138 to 54850 SKYLINE4 138 CKT 1	1094	Relieved or Impact Removed by Selected Ungrades for 1200 MW	
04SP OKGE OKGE 54852 SLVRLAK4 138 to 54853 DVISION4 138 CKT 1 287 65.7 102.8 8.9 54835 MEMRIAL4 138 to 54837 TENESTP4 138 CKT 1 1200 Invalid Contingency 04SP OKGE OKGE 54870 STONWAL4 138 to 54872 REMPKTP4 138 CKT 1 191 81.5 109.2 4.4 54835 MEMRIAL4 138 to 54837 TENESTP4 138 CKT 1 1200 Invalid Contingency 04SH OKGE OKGE 54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 2 1195 36.3 123.1 86.4 54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 1 880 Relieved or Impact Removed by Selected Upgrades for 1200 MW 04SH OKGE OKGE 54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 1 1195 36.2 122.8 86.2 54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 2 883 Relieved or Impact Removed by Selected Upgrades for 1200 MW	0401	JNGE	JIVII A	07002 E/101EI(144 130 to 30174 OWITAL EI(4 130 OKT 1	201	32.0	101.3	11.7	0-000 WILWINDER 130 to 34000 SIXTEINER 130 GRT 1	1034	Treneved of Impact Itemoved by Delected Opgrades 101 1200 MW	
04SP OKGE 54852 SLVRLAK4 138 to 54853 DVISION4 138 CKT 1 287 65.7 102.8 8.9 54835 MEMRIAL4 138 to 54837 TENESTP4 138 CKT 1 1200 Invalid Contingency 04SP OKGE OKGE 54870 STONWAL4 138 to 54872 REMPKTP4 138 CKT 1 191 81.5 109.2 4.4 54835 MEMRIAL4 138 to 54837 TENESTP4 138 CKT 1 1200 Invalid Contingency 04SH OKGE OKGE 54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 2 1195 36.3 123.1 86.4 54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 1 880 Relieved or Impact Removed by Selected Upgrades for 1200 MW 04SH OKGE OKGE 54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 1 1195 36.2 122.8 86.2 54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 2 883 Relieved or Impact Removed by Selected Upgrades for 1200 MW	04SP	OKGE	OKGE	54880 NORTWST7 345 WND 2 NORTWST3 2	493	73.8	100.4	10.9	54879 NORTWST4 138 to 54880 NORTWST7 345 to 55742 NORTWS1113 8 CKT 1	1134	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
04SP OKGE OKGE 54870 STONWAL4 138 to 54872 REMPKTP4 138 CKT 1 191 81.5 109.2 4.4 54835 MEMRIAL4 138 to 54837 TENESTP4 138 CKT 1 1200 Invalid Contingency 04SH OKGE OKGE 54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 2 1195 36.3 123.1 86.4 54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 1 880 Relieved or Impact Removed by Selected Upgrades for 1200 MW 04SH OKGE OKGE 54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 1 1195 36.2 122.8 86.2 54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 2 883 Relieved or Impact Removed by Selected Upgrades for 1200 MW												\vdash
04SH OKGE OKGE 54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 2 1195 36.3 123.1 86.4 54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 1 880 Relieved or Impact Removed by Selected Upgrades for 1200 MW 04SH OKGE OKGE 54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 1 1195 36.2 122.8 86.2 54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 2 883 Relieved or Impact Removed by Selected Upgrades for 1200 MW											ů ,	
04SH OKGE OKGE 54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 1 1195 36.2 122.8 86.2 54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 2 883 Relieved or Impact Removed by Selected Upgrades for 1200 MW												
	04SH	OKGE	OKGE	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 2	1195	36.3	123.1	86.4	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 1	880	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
											· · ·	
04SH OKGE 04SGE 04835 MEMRIAL4 138 to 54850 SKYLINE4 138 CKT 1 287 73.8 105.2 7.5 54833 DANFRTH4 138 to 56174 OMHAFER4 138 CKT 1 925 See Previous Solution Specified for Facility in Table 1.1										883		
	04SH	OKGE	OKGE	54835 MEMRIAL4 138 to 54850 SKYLINE4 138 CKT 1	287	73.8	105.2	7.5	54833 DANFRTH4 138 to 56174 OMHAFER4 138 CKT 1	925	See Previous Solution Specified for Facility in Table 1.1	

Study	From	To Area	Monitored Branch Overload	Rate <mva></mva>	BC % Loading	TC % Loading	%TDF		ATC (MW)	Solution	Estimated Cost
Case	Area	To Area	Monitored Branch Overload	<iviva></iviva>	Loading	Loading	%TDF	Outaged Branch Causing Overload (OKGE Terminal Equipment Project underway to increase line rating.	COSI
										Estimated In-Service Date 9/30/2004. New Emergeny Rating 308	
04SH	OKCE	OKCE	54000 KAMONENA 420 to 54007 ARCARIA 420 CKT 4	207	45.0	107.1	14.7	54000 NODTINGTZ 245 to 54000 ADCADIAZ 245 CVT 4	1037	MVA. Relieved or Impact Removed by Selected Upgrades for 1200 MW	
045H	OKGE	OKGE	54906 KAMOMEM4 138 to 54907 ARCADIA4 138 CKT 1	287	45.8	107.1	14.7	54880 NORTWST7 345 to 54908 ARCADIA7 345 CKT 1		OKGE Terminal Equipment Project underway to increase line rating.	
										Estimated In-Service Date 9/30/2004. New Emergeny Rating 308	
	01/05	01/05						ELONG BANESTILL AND A BANESTA PROPERTY.		MVA. Relieved or Impact Removed by Selected Upgrades for 1200	
04SH	OKGE	OKGE	54906 KAMOMEM4 138 to 54907 ARCADIA4 138 CKT 1	287	54.9	104.2	11.8	54833 DANFRTH4 138 to 54907 ARCADIA4 138 CKT 1	1075	MW	
04SH	OKGE	OKGE	54906 KAMOMEM4 138 to 54941 HSL 4 138 CKT 1	287	42.7	102.5	14.3		1140	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
04SH	OKGE	OKGE	54835 MEMRIAL4 138 to 54850 SKYLINE4 138 CKT 1	287	69.6	101.0	7.5	54832 EASTERN4 138 to 56174 OMHAFER4 138 CKT 1	1147	See Previous Solution Specified for Facility in Table 1.1	
04SH	OKGE	OKGE	54906 KAMOMEM4 138 to 54941 HSL 4 138 CKT 1	287	51.4	100.0	11.6	54833 DANFRTH4 138 to 54907 ARCADIA4 138 CKT 1	1199	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
04FA	OKGE	OKGE	54832 EASTERN4 138 to 54835 MEMRIAL4 138 CKT 1	191	74.2	106.2	5.1		958	See Previous Solution Specified for Facility in Table 1.1	
04FA	OKGE	OKGE	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 2	1195	27.7	114.2	86.1	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 1	1003	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
04FA	OKGE	OKGE	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 1	1195	27.7	114.0	85.9	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 2	1006	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
										OKGE Terminal Equipment Project underway to increase line rating.	
										Estimated In-Service Date 9/30/2004. New Emergeny Rating 308	
04FA	OKGE	OKGE	54906 KAMOMEM4 138 to 54907 ARCADIA4 138 CKT 1	287	52.5	103.0	12.1	54880 NORTWST7 345 to 54908 ARCADIA7 345 CKT 1	1123	MVA. Relieved or Impact Removed by Selected Upgrades for 1200 MW	
04WP	OKGE	OKGE	54832 EASTERN4 138 to 54835 MEMRIAL4 138 CKT 1	191	68.3	114.1	7.3		819	See Previous Solution Specified for Facility in Table 1.1	
04WP	OKGE	OKGE	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 2	1195	30.2	117.3	86.8	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 1	963	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
04WP	OKGE	OKGE	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 1	1195	30.1	117.1	86.6	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 2	966	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
04WP	OKGE	OKGE	54832 EASTERN4 138 to 54835 MEMRIAL4 138 CKT 1	191	63.8	106.0	6.7	0.0011/21011 1.00 (0.00170 0.001741/41 1.100 0.11 1	1064	See Previous Solution Specified for Facility in Table 1.1	
04WP	OKGE	OKGE	54832 EASTERN4 138 to 54835 MEMRIAL4 138 CKT 1	191	56.8	105.1	7.7	54906 KAMOMEM4 138 to 54907 ARCADIA4 138 CKT 1	1088	See Previous Solution Specified for Facility in Table 1.1	
04VVP	OKGE	OKGE	54832 EASTERN4 138 to 54835 MEMRIAL4 138 CKT 1	191	56.1	104.7	7.7	54906 KAMOMEM4 138 to 54941 HSL 4 138 CKT 1	1001	See Previous Solution Specified for Facility in Table 1.1 OKGE Terminal Equipment Project underway to increase line rating.	
										Estimated In-Service Date 9/30/2004. New Emergeny Rating 308	
										MVA. Relieved or Impact Removed by Selected Upgrades for 1200	
04WP	OKGE OKGE	OKGE OKGE	54906 KAMOMEM4 138 to 54907 ARCADIA4 138 CKT 1 54832 EASTERN4 138 to 54835 MEMRIAL4 138 CKT 1	287 191	39.6 60.2	105.5 102.3	15.8 6.7		1099 1147	MW See Previous Solution Specified for Facility in Table 1.1	
U4VVP	UNGE	UNGE	54632 EASTERN4 136 to 54635 MEMRIAL4 136 CRT 1	191	60.2	102.3	6.7	54650 SKTLINE4 136 to 56173 OMFAIRF4 136 CKT 1		OKGE Terminal Equipment Project underway to increase line rating.	
										Estimated In-Service Date 9/30/2004. New Emergeny Rating 308	
										MVA. Relieved or Impact Removed by Selected Upgrades for 1200	
04WP	OKGE	OKGE	54906 KAMOMEM4 138 to 54907 ARCADIA4 138 CKT 1	287	48.0	101.9	12.9	54833 DANFRTH4 138 to 54907 ARCADIA4 138 CKT 1	1156	MW	
04WP	OKGE	OKGE	54906 KAMOMEM4 138 to 54941 HSL 4 138 CKT 1	287	36.5	101.2	15.5	54880 NORTWST7 345 to 54908 ARCADIA7 345 CKT 1	1178	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
04WP	OKGE	OKGE	54832 EASTERN4 138 to 54835 MEMRIAL4 138 CKT 1	191	50.2	100.4	8.0	54880 NORTWST7 345 to 54908 ARCADIA7 345 CKT 1	1191	See Previous Solution Specified for Facility in Table 1.1	
05AP	OKGE	OKGE	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 2	1195	35.9	112.3	76.1	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 1	1028	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
00/11	ONOL	ONOL	34300 / ((C/IDIN) 540 to 34303 (CDD0D) 343 G((2	1100	00.0	112.0	70.1	34300 / INO/IDIN I	1020	Traileved of Impact Nemoved by delected opgrades for 1200 WW	
05AP	OKGE	OKGE	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 1	1195	35.8	112.0	76.0	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 2	1031	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
05G	OKGE	OKGE	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 2	1195	38.2	124.7	86.1	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 1	842	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
000	JNGE	JNGE	0-300 / ((Online) 340 to 3400 ((LDD0D / 340 ON) 2	1133	30.2	124.7	00.1	סייסט אויסאסאוא פייסט וויסטסט אויסאסאוא סייסט וויסטסטאוא סייסט וויסטסטאוא סייסט	U42	Trailered or impact fremoved by delected opgrades for 1200 MW	
05G	OKGE	OKGE	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 1	1195	38.2	124.5	86.0		845	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
05G	OKGE	OKGE	54832 EASTERN4 138 to 54835 MEMRIAL4 138 CKT 1	191	45.7	111.8	10.5	54835 MEMRIAL4 138 to 54850 SKYLINE4 138 CKT 1	872	See Previous Solution Specified for Facility in Table 1.1	
										OKGE Terminal Equipment Project underway to increase line rating. Estimated In-Service Date 9/30/2004. New Emergeny Rating 308	
										MVA. Relieved or Impact Removed by Selected Upgrades for 1200	
05G	OKGE	OKGE	54906 KAMOMEM4 138 to 54907 ARCADIA4 138 CKT 1	287	18.5	108.6	21.5	54880 NORTWST7 345 to 54908 ARCADIA7 345 CKT 1	1022	MW	
05G	OKGE	OKGE	54906 KAMOMEM4 138 to 54941 HSL 4 138 CKT 1	287	16.3	106.9	21.7	54880 NORTWST7 345 to 54908 ARCADIA7 345 CKT 1	1049	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
000	JILOL	JILOL	0.000 10 MICHIENT 100 to 04041 FIGE 4 100 OKT 1	201	10.0	100.3	21.7	3.335 NORTH 017 040 to 04000 / NORTH 040 01(1 1		OKGE Terminal Equipment Project underway to increase line rating.	
										Estimated In-Service Date 9/30/2004. New Emergeny Rating 308	
050	OKCE	OKOE	E4006 KAMOMEMA 429 to E4007 ADCADIA 4 420 OVT 4	207	26.7	104 4	10.0	E4922 DANIEDTH4 120 to E4007 ADCADIA 4 400 CIVT 4	1082	MVA. Relieved or Impact Removed by Selected Upgrades for 1200	
05G 05G	OKGE OKGE	OKGE OKGE	54906 KAMOMEM4 138 to 54907 ARCADIA4 138 CKT 1 54832 EASTERN4 138 to 54835 MEMRIAL4 138 CKT 1	287 191	26.7 46.9	104.4 104.1	18.6 9.1		1082	MW See Previous Solution Specified for Facility in Table 1.1	}
05G	OKGE	OKGE	54850 SKYLINE4 138 to 54835 MEMRIAL4 138 CKT 1	287	49.0	102.1	12.7		1109	See Previous Solution Specified for Facility in Table 1.1	
0.55	01/05	01/05				100.5					
05G	OKGE	OKGE	54906 KAMOMEM4 138 to 54941 HSL 4 138 CKT 1 54832 EASTERN4 138 to 54835 MEMRIAL4 138 CKT 1	287 191	24.3 33.7	103.2	18.9 10.9	54833 DANFRTH4 138 to 54907 ARCADIA4 138 CKT 1 1 54906 KAMOMEM4 138 to 54941 HSL 4 138 CKT 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	1110	Relieved or Impact Removed by Selected Upgrades for 1200 MW See Previous Solution Specified for Facility in Table 1.1	1
USG	UNGE	UNGE	34032 LAGTERINA 130 (0 34033 WEWRIALA 130 CKT 1	191	33.1	102.3	10.9	SHOULD NAMED IN SHEAT I HOL 4 130 CV I I	1130	See Frevious Solution Specified for Facility in Table 1.1	

Study Case	From Area	To Area	Monitored Branch Overload	Rate <mva></mva>	BC % Loading	TC % Loading	%TDF	Outaged Branch Causing Overload	ATC (MW)	Solution	Estimated Cost
05G	OKGE	OKGE	54832 EASTERN4 138 to 54835 MEMRIAL4 138 CKT 1	191	34.1	101.8	10.8	54906 KAMOMEM4 138 to 54907 ARCADIA4 138 CKT 1	1152	See Previous Solution Specified for Facility in Table 1.1	
05SP	OKGE	OKGE	54880 NORTWST7 345 WND 2 NORTWST2 1	493	81.6	112.6	12.7	54879 NORTWST4 138 to 54880 NORTWST7 345 to 55743 NORTWS2113.8 CKT 2	652	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
05SP	OKGE	OKGE	54879 NORTWST4 138 WND 1 NORTWST2 1	493	80.0	109.3	12.0	54879 NORTWST4 138 to 54880 NORTWST7 345 to 55743 NORTWS2113.8 CKT 2	734	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
										OKGE Terminal Equipment Project underway to increase line rating. Estimated In-Service Date 9/30/2004. New Emergeny Rating 308 MVA. Relieved or Impact Removed by Selected Upgrades for 1200	
05SP	OKGE	OKGE	54906 KAMOMEM4 138 to 54907 ARCADIA4 138 CKT 1	287	31.4	113.0	19.5	54833 DANFRTH4 138 to 54907 ARCADIA4 138 CKT 1	845	MW	
05SP	OKGE	OKGE	54908 ARCADIA7 345 WND 2 ARCADIA2 1	493	51.3	109.9	24.1	54907 ARCADIA4 138 to 54908 ARCADIA7 345 to 55704 ARCADI2113.8 CKT 2	892	See Previous Solution Specified for Facility in Table 1.1 OKGE Terminal Equipment Project underway to increase line rating. Estimated In-Service Date 9/30/2004. New Emergeny Rating 308 MVA. Relieved or Impact Removed by Selected Upgrades for 1200	
05SP	OKGE	OKGE	54906 KAMOMEM4 138 to 54907 ARCADIA4 138 CKT 1	287	20.9	113.7	22.2	54880 NORTWST7 345 to 54908 ARCADIA7 345 CKT 1	895	MW	
05SP	OKGE	OKGE	54894 CZECHAL4 138 to 54898 CIMARON4 138 CKT 1	382	70.1	105.5	11.3	54902 MCCLAIN4 138 to 54929 PLVALLY4 138 CKT 1	926	See Previous Solution Specified for Facility in Table 1.1	
05SP	OKGE	OKGE	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 2	1195	31.0	119.3	88.0	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 1	935	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
05SP	OKGE	OKGE	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 1	1195	30.9	119.1	87.8	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 2	938	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
05SP	OKGE	OKGE	54870 STONWAL4 138 to 54872 REMPKTP4 138 CKT 1	191	77.5	107.1	4.7	Multiple Contingency Outage: 54837 TENESTP4 138 to 54843 84TH ST4 138 CKT 1 54835 MEMRIAL4 138 to 54837 TENESTP4 138 CKT 1 54838 TENNESE4 138 to 54837 TENESTP4 138 CKT 1	940	See Previous Solution Specified for Facility in Table 1.1	
05SP	OKGE	OKGE	54880 NORTWST7 345 WND 2 NORTWST3 2	493	74.6	103.2	11.7	54879 NORTWST4 138 to 54880 NORTWST7 345 to 55742 NORTWS1113.8 CKT 1	941	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
05SP 05SP	OKGE	OKGE OKGE	54908 ARCADIA7 345 WND 2 ARCADIA3 2 54907 ARCADIA4 138 WND 1 ARCADIA2 1	493 493	50.0 50.5	107.1 106.3	23.4	54907 ARCADIA4 138 to 54908 ARCADIA7 345 to 55703 ARCADI1113.8 CKT 1 54907 ARCADIA4 138 to 54908 ARCADIA7 345 to 55704 ARCADI2113.8 CKT 2	952 967	Relieved or Impact Removed by Selected Upgrades for 1200 MW See Previous Solution Specified for Facility in Table 1.1	
0331	ONGL	ONGL	34307 ARCADIA4 130 WIND I ARCADIA2 1	433	30.3	100.5	22.5	34907 ARCADIA4 130 to 34900 ARCADIA7 343 to 33704 ARCADI2113.0 CR1 2	301	See Frevious Solution Specified for Facility III Fable 1.1	
05SP	OKGE	OKGE	54906 KAMOMEM4 138 to 54941 HSL 4 138 CKT 1	287	22.5	105.3	19.8	54833 DANFRTH4 138 to 54907 ARCADIA4 138 CKT 1	1018	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
05SP	OKGE	OKGE	54906 KAMOMEM4 138 to 54941 HSL 4 138 CKT 1	287	12.4	105.6	22.3	54880 NORTWST7 345 to 54908 ARCADIA7 345 CKT 1	1053	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
05SP	OKGE	OKGE	54907 ARCADIA4 138 WND 1 ARCADIA3 2	493	49.2	103.5	22.3	54907 ARCADIA4 138 to 54908 ARCADIA7 345 to 55703 ARCADI1113.8 CKT 1	1055	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
05SP	OKGE	OKGE	54851 QUAILCK4 138 to 54873 LONEOAK4 138 CKT 1	308	67.5	100.5	8.5	54854 BRADEN 4 138 to 54879 NORTWST4 138 CKT 1	1141	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
05SP	OKGE	OKGE	54908 ARCADIA7 345 WND 2 ARCADIA2 1	493	40.5	100.3	24.6	54880 NORTWST7 345 to 54908 ARCADIA7 345 CKT 1	1189	See Previous Solution Specified for Facility in Table 1.1	
05SP	OKGE	OKGE	54879 NORTWST4 138 WND 1 NORTWST3 2	493	73.3	100.0	11.0	54879 NORTWST4 138 to 54880 NORTWST7 345 to 55742 NORTWS1113.8 CKT 1	1194	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
05SP	OKGE	OKGE	54870 STONWAL4 138 to 54872 REMPKTP4 138 CKT 1	191	77.2	106.1	4.6	54835 MEMRIAL4 138 to 54837 TENESTP4 138 CKT 1	1200	Invalid Contingency	
05SP	OKGE	OKGE	54988 TINKER44 138 to 54990 TINKER24 138 CKT 1	100	48.9	119.6	5.9	54965 POSTRDT4 138 to 54993 SE15TH 4 138 CKT 1	1200	Not a valid Overload; Relays trip to open UG transmission line when loading reaches 100%, No problem exist with line open.	
05SH	OKGE	OKGE	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 2	1195	35.9	122.8	86.5	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 1	883	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
05SH	OKGE	OKGE	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 1	1195	35.8	122.5	86.3	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 2	886	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
05SH	OKGE	OKGE	54906 KAMOMEM4 138 to 54907 ARCADIA4 138 CKT 1	287	47.8	109.4	14.7	54880 NORTWST7 345 to 54908 ARCADIA7 345 CKT 1	1003	OKGE Terminal Equipment Project underway to increase line rating. Estimated In-Service Date 9/30/2004. New Emergeny Rating 308 MVA. Relieved or Impact Removed by Selected Upgrades for 1200 MW	
00011	JILOL	JILOL	5 1555 TO MINISTERIA 100 TO 04501 / MONDINA 100 OKT 1	201	71.0	100.7	17.7	C. 1000 HOLLING IT OF OLD OF OLD ALLOHOLINE OF OLD IT	1000	OKGE Terminal Equipment Project underway to increase line rating.	
05SH	OKGE	OKGE	54906 KAMOMEM4 138 to 54907 ARCADIA4 138 CKT 1	287	57.3	106.7	11.8	54833 DANFRTH4 138 to 54907 ARCADIA4 138 CKT 1	1016	Estimated In-Service Date 9/30/2004. New Emergeny Rating 308 MVA. Relieved or Impact Removed by Selected Upgrades for 1200 MW	
05SH	OKGE	OKGE	54880 NORTWST7 345 WND 2 NORTWST2 1	493	83.5	101.0	7.2	54879 NORTWST4 138 to 54880 NORTWST7 345 to 55743 NORTWS2113.8 CKT 2	1096	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
05SH	OKGE	OKGE	54906 KAMOMEM4 138 to 54941 HSL 4 138 CKT 1	287	44.4	104.4	14.3	54880 NORTWST7 345 to 54908 ARCADIA7 345 CKT 1	1105	Relieved or Impact Removed by Selected Opgrades for 1200 MW	
DOCU	ONGE	UNGE	54500 NAIVIOWEIVI4 130 to 54941 HSL 4 130 CKT 1	201	44.4	104.4	14.3	Multiple Contingency Outage:	1105	Nelieved of Impact Nemoved by Selected Opgrades for 1200 MW	1
0501	OKCE	OKCE	E4070 CTONIMAL 4 120 to E4072 DEMDI/TD4 420 C//T 4	101	74.1	101.0	4.2	54837 TENESTP4 138 to 54843 84TH ST4 138 CKT 1 54835 MEMRIAL4 138 to 54837 TENESTP4 138 CKT 1	1139	Coo Provious Colution Consider for Enablity in Table 4.4	
05SH	OKGE	OKGE	54870 STONWAL4 138 to 54872 REMPKTP4 138 CKT 1	191	74.1	101.0	4.3	54838 TENNESE4 138 to 54837 TENESTP4 138 CKT 1	1139	See Previous Solution Specified for Facility in Table 1.1	+ +
05SH 05SH	OKGE OKGE	OKGE OKGE	54906 KAMOMEM4 138 to 54941 HSL 4 138 CKT 1 54908 ARCADIA7 345 WND 2 ARCADIA2 1	287 493	53.4 59.3	102.1 100.2	11.6 16.8	54833 DANFRTH4 138 to 54907 ARCADIA4 138 CKT 1 54907 ARCADIA4 138 to 54908 ARCADIA7 345 to 55704 ARCADI2113.8 CKT 2	1141 1193	Relieved or Impact Removed by Selected Upgrades for 1200 MW See Previous Solution Specified for Facility in Table 1.1	

Study	From Area	To Area	Monitored Branch Overload	Rate <mva></mva>	BC % Loading	TC % Loading	%TDF	Outaged Branch Causing Overload	ATC (MW)	Solution	Estimated Cost
											Cost
05FA	OKGE	OKGE	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 2	1195	26.2	113.2	86.6	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 1	1017	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
05FA	OKGE		54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 1	1195	26.2	113.0	86.5	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 2	1020	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
05FA	OKGE	OKGE	54832 EASTERN4 138 to 54835 MEMRIAL4 138 CKT 1	191	53.8	102.5	7.8	54835 MEMRIAL4 138 to 54850 SKYLINE4 138 CKT 1	1102	See Previous Solution Specified for Facility in Table 1.1 OKGE Terminal Equipment Project underway to increase line rating.	
										Estimated In-Service Date 9/30/2004. New Emergeny Rating 308	
05FA	OKGE	OKGE	54906 KAMOMEM4 138 to 54907 ARCADIA4 138 CKT 1	287	29.6	101.5	17.2	54880 NORTWST7 345 to 54908 ARCADIA7 345 CKT 1	1162	MVA. Relieved or Impact Removed by Selected Upgrades for 1200 MW	
05WP	OKGE	OKGE	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 2	1195	35.3	121.9	86.2	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 1	897	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
05WP	OKGE	OKGE	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 1	1195	35.2	121.7	86.1	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 2	900	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
										OKGE Terminal Equipment Project underway to increase line rating. Estimated In-Service Date 9/30/2004. New Emergeny Rating 308	
										MVA. Relieved or Impact Removed by Selected Upgrades for 1200	
05WP	OKGE	OKGE	54906 KAMOMEM4 138 to 54907 ARCADIA4 138 CKT 1	287	52.2	103.8	12.3	54880 NORTWST7 345 to 54908 ARCADIA7 345 CKT 1	1113	MW	
07SP	OKGE	OKGE	54880 NORTWST7 345 WND 2 NORTWST2 1	493	83.4	117.6	14.1	54879 NORTWST4 138 to 54880 NORTWST7 345 to 55743 NORTWS2113.8 CKT 2	588	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
07SP	OKGE	OKGE	54879 NORTWST4 138 WND 1 NORTWST2 1	493	81.8	113.8	13.1	54879 NORTWST4 138 to 54880 NORTWST7 345 to 55743 NORTWS2113.8 CKT 2	665	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
										OKGE Terminal Equipment Project underway to increase line rating.	
										Estimated In-Service Date 9/30/2004. New Emergeny Rating 308 MVA. Relieved or Impact Removed by Selected Upgrades for 1200	
07SP	OKGE		54906 KAMOMEM4 138 to 54907 ARCADIA4 138 CKT 1	287	30.2	117.4	20.9	54833 DANFRTH4 138 to 54907 ARCADIA4 138 CKT 1	837	MW	
07SP	OKGE	OKGE	54908 ARCADIA7 345 WND 2 ARCADIA2 1	493	52.3	114.4	25.5	54907 ARCADIA4 138 to 54908 ARCADIA7 345 to 55704 ARCADI2113.8 CKT 2	855	See Previous Solution Specified for Facility in Table 1.1	
07SP	OKGE	OKGE	54880 NORTWST7 345 WND 2 NORTWST3 2	493	76.4	107.8	12.9	54879 NORTWST4 138 to 54880 NORTWST7 345 to 55742 NORTWS1113.8 CKT 1	879	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
										OKGE Terminal Equipment Project underway to increase line rating. Estimated In-Service Date 9/30/2004. New Emergeny Rating 308	
										MVA. Relieved or Impact Removed by Selected Upgrades for 1200	
07SP	OKGE	OKGE	54906 KAMOMEM4 138 to 54907 ARCADIA4 138 CKT 1	287	19.1	117.1	23.4	54880 NORTWST7 345 to 54908 ARCADIA7 345 CKT 1	888	MW	
								Multiple Contingency Outage: 54837 TENESTP4 138 to 54843 84TH ST4 138 CKT 1			
								54835 MEMRIAL4 138 to 54837 TENESTP4 138 CKT 1			
07SP	OKGE	OKGE	54870 STONWAL4 138 to 54872 REMPKTP4 138 CKT 1	191	80.7	114.1	5.3	54838 TENNESE4 138 to 54837 TENESTP4 138 CKT 1	898	See Previous Solution Specified for Facility in Table 1.1	
07SP	OKGE		54908 ARCADIA7 345 WND 2 ARCADIA3 2	493	51.0	111.6	24.9	54907 ARCADIA4 138 to 54908 ARCADIA7 345 to 55703 ARCADI1113.8 CKT 1	908	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
07SP	OKGE		54907 ARCADIA4 138 WND 1 ARCADIA2 1 54894 CZECHAL4 138 to 54898 CIMARON4 138 CKT 1	493 382	51.5 70.1	110.3 110.7	24.2 12.9	54907 ARCADIA4 138 to 54908 ARCADIA7 345 to 55704 ARCADI2113.8 CKT 2 54902 MCCLAIN4 138 to 54929 PLVALLY4 138 CKT 1	916 952	See Previous Solution Specified for Facility in Table 1.1 See Previous Solution Specified for Facility in Table 1.1	
0.0.										,	
07SP	OKGE	OKGE	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 2	1195	28.7	117.5	88.4	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 1	966	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
07SP	OKGE	OKGE	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 1	1195	28.6	117.2	88.2	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 2	968	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
07SP	OKGE	OKGE	54879 NORTWST4 138 WND 1 NORTWST3 2	493	74.9	104.2	12.0	54879 NORTWST4 138 to 54880 NORTWST7 345 to 55742 NORTWS1113.8 CKT 1	970	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
07SP	OKGE	OKGE	54907 ARCADIA4 138 WND 1 ARCADIA3 2	493	50.2	107.4	23.5	54907 ARCADIA4 138 to 54908 ARCADIA7 345 to 55703 ARCADI1113.8 CKT 1	976	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
07SP	OKGE	OKGE	54906 KAMOMEM4 138 to 54941 HSL 4 138 CKT 1	287	19.7	108.3	21.2	54833 DANFRTH4 138 to 54907 ARCADIA4 138 CKT 1	991	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
07SP	OKGE	OKGE	54853 DVISION4 138 to 54863 HAYMAKR4 138 CKT 1	287	68.3	106.7	9.2	54894 CZECHAL4 138 to 54898 CIMARON4 138 CKT 1	992	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
07SP	OKGE	OKGE	54851 QUAILCK4 138 to 54873 LONEOAK4 138 CKT 1	308	68.5	105.1	9.4	54854 BRADEN 4 138 to 54879 NORTWST4 138 CKT 1	997	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
07SP	OKGE	OKGE	54851 QUAILCK4 138 to 54873 LONEOAK4 138 CKT 1	308	67.7	104.3	9.4	54852 SLVRLAK4 138 to 54854 BRADEN 4 138 CKT 1	1027	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
07SP	OKGE	OKGE	54906 KAMOMEM4 138 to 54941 HSL 4 138 CKT 1	287	9.0	107.5	23.6	54880 NORTWST7 345 to 54908 ARCADIA7 345 CKT 1	1038	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
07SP	OKGE		54908 ARCADIA7 345 WND 2 ARCADIA2 1	493	40.9	103.5	25.7	54880 NORTWST7 345 to 54908 ARCADIA7 345 CKT 1	1116	See Previous Solution Specified for Facility in Table 1.1	
07SP	OKGE	OKGE	54853 DVISION4 138 to 54863 HAYMAKR4 138 CKT 1	287	63.7	101.6	9.1	54893 XEROX 4 138 to 54894 CZECHAL4 138 CKT 1	1149	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
07SP	OKGE	OMPA	54832 EASTERN4 138 to 56174 OMHAFER4 138 CKT 1	287	49.3	101.6	12.5	54835 MEMRIAL4 138 to 54850 SKYLINE4 138 CKT 1	1149	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
	OKGE OKGE	OKGE OKGE	54880 NORTWST7 345 WND 2 NORTWST2	493 493	67.1 40.5	100.7 100.4	13.8 24.6	54880 NORTWST7 345 to 54901 CIMARON7 345 CKT 1 54880 NORTWST7 345 to 54908 ARCADIA7 345 CKT 1	1173 1188	Relieved or Impact Removed by Selected Upgrades for 1200 MW See Previous Solution Specified for Facility in Table 1.1	1

Study	From			Rate	BC %	TC %			ATC		Estimated
Case	Area	To Area	Monitored Branch Overload	<mva></mva>	Loading	Loading	%TDF	Outaged Branch Causing Overload	(MW)	Solution	Cost
07SP	OKGE	OKGE	54894 CZECHAL4 138 to 54898 CIMARON4 138 CKT 1	382	57.2	100.2	13.7	54853 DVISION4 138 to 54863 HAYMAKR4 138 CKT 1	1195	See Previous Solution Specified for Facility in Table 1.1	
07SP	OKGE	OKGE	54849 LAKESID4 138 to 54853 DVISION4 138 CKT 1	287	84.8	101.0	3.9	54835 MEMRIAL4 138 to 54837 TENESTP4 138 CKT 1	1200	Invalid Contingency	
07SP	OKGE	OKGE	54870 STONWAL4 138 to 54872 REMPKTP4 138 CKT 1	191	80.3	112.9	5.2	54835 MEMRIAL4 138 to 54837 TENESTP4 138 CKT 1	1200	Invalid Contingency	
07WP	OKGE	OKGE	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 2	1195	32.7	120.3	87.2	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 1	919	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
07WP	OKGE	OKGE	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 1	1195	32.6	120.0	87.1	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 2	922	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
07WP	OKGE	OKGE	54906 KAMOMEM4 138 to 54907 ARCADIA4 138 CKT 1	287	17.0	103.8	20.8	54880 NORTWST7 345 to 54908 ARCADIA7 345 CKT 1	1109	OKGE Terminal Equipment Project underway to increase line rating. Estimated In-Service Date 9/30/2004. New Emergeny Rating 308 MVA. Relieved or Impact Removed by Selected Upgrades for 1200 MW	
10SP	OKGE	OKGE	54880 NORTWST7 345 WND 2 NORTWST2 1	493	85.8	119.8	14.0	54879 NORTWST4 138 to 54880 NORTWST7 345 to 55743 NORTWS2113.8 CKT 2	582	Facility Limits Service to 1195 MW 6/1/2009-10/1/2009 and Limits Renewal Rights to 1165 MW 6/1/2010 with Selected Upgrades modeled for 1200 MW,	
10SP	OKGE	OKGE	54879 NORTWST4 138 WND 1 NORTWST2 1	493	84.1	116.2	13.2	54879 NORTWST4 138 to 54880 NORTWST7 345 to 55743 NORTWS2113.8 CKT 2	654	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
10SP	OKGE	OKGE	54908 ARCADIA7 345 WND 2 ARCADIA2 1	493	53.0	116.6	26.1	54907 ARCADIA4 138 to 54908 ARCADIA7 345 to 55704 ARCADI2113.8 CKT 2	867	See Previous Solution Specified for Facility in Table 1.1	
10SP	OKGE	OKGE	54880 NORTWST7 345 WND 2 NORTWST3 2	493	78.6	109.9	12.9	54879 NORTWST4 138 to 54880 NORTWST7 345 to 55742 NORTWS1113.8 CKT 1	868	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
1001	ONOL	ONOL	04000 NORTWOTT 040 WND 2 NORTWOTO 2	400	70.0	100.0	12.0	04013 NOICHWOTH 100 to 04000 NOICHWOTT 040 to 00142 NOICHWOTT 10.0 CICL 1	000	Relieved of Impact Nemoved by delected opgrades for 1200 MW	1
10SP	OKGE	OKGE	54965 POSTRDT4 138 to 54993 SE15TH 4 138 CKT 1	191	46.7	112.1	10.4	54965 POSTRDT4 138 to 54994 TINKER54 138 CKT 1	878	Relieved or Impact Removed by Selected Upgrades for 1200 MW OKGE Terminal Equipment Project underway to increase line rating.	
										Estimated In-Service Date 9/30/2004. New Emergeny Rating 308 MVA. Relieved or Impact Removed by Selected Upgrades for 1200	
10SP	OKGE	OKGE	54906 KAMOMEM4 138 to 54907 ARCADIA4 138 CKT 1	287	29.0	118.0	21.3	54833 DANFRTH4 138 to 54907 ARCADIA4 138 CKT 1	901	MW	
10SP	OKGE	OKGE	54908 ARCADIA7 345 WND 2 ARCADIA3 2 54907 ARCADIA4 138 WND 1 ARCADIA2 1	493 493	51.7 52.1	113.6 112.4	25.5 24.8	54907 ARCADIA4 138 to 54908 ARCADIA7 345 to 55703 ARCADI1113.8 CKT 1 54907 ARCADIA4 138 to 54908 ARCADIA7 345 to 55704 ARCADI2113.8 CKT 2	911 921	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
10SP	OKGE	OKGE	54906 KAMOMEM4 138 to 54907 ARCADIA4 138 CKT 1	287	16.0	116.2	24.0	54880 NORTWST7 345 to 54908 ARCADIA7 345 CKT 1	947	See Previous Solution Specified for Facility in Table 1.1 OKGE Terminal Equipment Project underway to increase line rating. Estimated In-Service Date 9/30/2004. New Emergeny Rating 308 MVA. Relieved or Impact Removed by Selected Upgrades for 1200 MW	
10SP	OKGE	OKGE	54907 ARCADIA4 138 WND 1 ARCADIA3 2	493	50.8	109.5	24.1	54907 ARCADIA4 138 to 54908 ARCADIA7 345 to 55703 ARCADI1113.8 CKT 1	970	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
10SP	OKGE	OKGE	54879 NORTWST4 138 WND 1 NORTWST3 2	493	77.0	106.4	12.1	54879 NORTWST4 138 to 54880 NORTWST7 345 to 55742 NORTWS1113.8 CKT 1	981	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
10SP	OKGE	OKGE	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 2	1195	25.5	114.2	88.3	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 1	1010	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
10SP	OKGE	OKGE	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 1	1195	25.4	113.9	88.1	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 2	1013	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
10SP	OKGE	OKGE	54906 KAMOMEM4 138 to 54941 HSL 4 138 CKT 1	287	17.0	107.2	21.6	54833 DANFRTH4 138 to 54907 ARCADIA4 138 CKT 1	1039	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
10SP	OKGE	OKGE	54851 QUAILCK4 138 to 54873 LONEOAK4 138 CKT 1 54894 CZECHAL4 138 to 54898 CIMARON4 138 CKT 1	308 382	67.8 68.6	103.7 107.0	9.2	54854 BRADEN 4 138 to 54879 NORTWST4 138 CKT 1 54902 MCCLAIN4 138 to 54929 PLVALLY4 138 CKT 1	1095 1104	Relieved or Impact Removed by Selected Upgrades for 1200 MW See Previous Solution Specified for Facility in Table 1.1	
10SP	OKGE	OKGE	54906 KAMOMEM4 138 to 54941 HSL 4 138 CKT 1	287	4.4	105.1	24.1	54880 NORTWST7 345 to 54908 ARCADIA7 345 CKT 1	1105	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
10SP	OKGE	OKGE	54851 QUAILCK4 138 to 54873 LONEOAK4 138 CKT 1	308	67.0	102.9	9.2	54852 SLVRLAK4 138 to 54854 BRADEN 4 138 CKT 1	1118	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
10SP	OKGE	OKGE	54880 NORTWST7 345 WND 2 NORTWST2 1	493	69.1	102.6	13.8	54880 NORTWST7 345 to 54901 CIMARON7 345 CKT 1	1121	Relieved or Impact Removed by Selected Upgrades for 1200 MW	
10SP	OKGE	OKGE	54908 ARCADIA7 345 WND 2 ARCADIA2 1	493	39.9	103.8	26.3	54880 NORTWST7 345 to 54908 ARCADIA7 345 CKT 1	1124	See Previous Solution Specified for Facility in Table 1.1	
10SP	OKGE	OKGE	54853 DVISION4 138 to 54863 HAYMAKR4 138 CKT 1 54907 ARCADIA4 138 WND 1 ARCADIA2 1	287 493	67.1 39.5	103.3 100.8	8.6 25.2	54894 CZECHAL4 138 to 54898 CIMARON4 138 CKT 1 54880 NORTWST7 345 to 54908 ARCADIA7 345 CKT 1	1144	Relieved or Impact Removed by Selected Upgrades for 1200 MW See Previous Solution Specified for Facility in Table 1.1	
10SP	OKGE	OKGE	54870 STONWAL4 138 to 54872 REMPKTP4 138 CKT 1	191	71.2	100.9	4.7	Multiple Contingency Outage: 54837 TENESTP4 138 to 54843 84TH ST4 138 CKT 1 54835 MEMRIAL4 138 to 54837 TENESTP4 138 CKT 1 54836 TENNESE4 138 to 54837 TENESTP4 138 CKT 1	1185	See Previous Solution Specified for Facility in Table 1.1	
1000	OKCE	OKCE	54970 NORTWETA 129 WIND 1 NORTWETS 4	402	60.0	100.2	122	E4000 NIODTINICTT 245 to E4004 CIMADONT 245 CVT 4	1104	Policy and as Impact Removed by Colosted Lingrades for 4200 MW	
10SP	OKGE	OKGE	54879 NORTWST4 138 WND 1 NORTWST2 1 54988 TINKER44 138 to 54990 TINKER24 138 CKT 1	493 100	68.0 82.3	100.3	13.3	54880 NORTWST7 345 to 54901 CIMARON7 345 CKT 1 54965 POSTRDT4 138 to 54993 SE15TH 4 138 CKT 1	1191	Relieved or Impact Removed by Selected Upgrades for 1200 MW Not a valid Overload; Relays trip to open UG transmission line when loading reaches 100%, No problem exist with line open.	
10WP		OKGE	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 2	1195	32.4	117.6	84.8	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 1	954	Relieved or Impact Removed by Selected Upgrades for 1200 MW	

Study	From			Rate	BC %	TC %			ATC		Estimated
		To Area	Monitored Branch Overload		Loading		%TDF		(MW)	Solution	Cost
10WP	OKGE	OKGE	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 1	1195	32.4	117.4	84.7	54908 ARCADIA7 345 to 54909 REDBUD 7 345 CKT 2		Relieved or Impact Removed by Selected Upgrades for 1200 MW	
										OKGE Terminal Equipment Project underway to increase line rating. Estimated In-Service Date 9/30/2004. New Emergeny Rating 308	
10WP	OKGE	OKGE	54906 KAMOMEM4 138 to 54907 ARCADIA4 138 CKT 1	287	34.7	106.5	17.2	54880 NORTWST7 345 to 54908 ARCADIA7 345 CKT 1	1052	MVA. Relieved or Impact Removed by Selected Upgrades for 1200 MW	
										OKGE Terminal Equipment Project underway to increase line rating. Estimated In-Service Date 9/30/2004. New Emergeny Rating 308	
10WP	OKGE	OKGE	54906 KAMOMEM4 138 to 54907 ARCADIA4 138 CKT 1	287	42.7	102.4	14.3	54833 DANFRTH4 138 to 54907 ARCADIA4 138 CKT 1		MVA. Relieved or Impact Removed by Selected Upgrades for 1200 MW	
.5001	J. LOL	5OL	0.000.10.00.00.00.00.00.00.00.00.00.00.0	237		.02.4	. 1.0	0.000 B. II. I I I I I I I I I I I I I I I I	20	Total Estimated Engineering and Construction Cost	\$ -

SPP-2003-271-2 Table 3.2a - Modeling Representation for Table 3.2 Includes Bus Numbers and Bus Names

					BC Without	BC With	TC Without	TC With			
Study	From			Rate	Upgrades	Upgrades	Upgrades	Upgrades			Estimated
Case	Area	To Area	Monitored Branch Overload	<mva></mva>	%Loading	%Loading	%Loading	%Loading	Outaged Branch Causing Overload	Solution	Cost
05AP			NONE IDENTIFIED								Ì
05G			NONE IDENTIFIED								
05SH			NONE IDENTIFIED								
05FA			NONE IDENTIFIED								
		01/05							Multiple Contingency Outage: 54837 TENESTP4 138 to 54843 84TH ST4 138 CKT 1 54835 MEMRIAL4 138 to 54837 TENESTP4 138 CKT 1		
		OKGE	54870 STONWAL4 138 to 54869 WESTERN4 138 CKT 1	191	75.6	79.9	86.1	102.3	54838 TENNESE4 138 to 54837 TENESTP4 138 CKT 1	Replace Wavetrap	\$ 50,000
07WP			NONE IDENTIFIED								
10SP			NONE IDENTIFIED								
10WP			NONE IDENTIFIED								
					·				·	Total Estimated Engineering and Construction Cost	\$ 50,000