BEFORE THE
MISSOURI PUBLIC SERVICE COMMISSION
CASE NO. EM-97-515
WESTERN RESOURCES, INC
AND KANSAS CITY POWER AND LIGHT
SUPPLEMENTAL DIRECT TESTIMONY OF
RICHARD A. DIXON

Exhibit No.:	
Issues:	Description of import capabilities and an update on Southwest Power Pool activities
Witness:	Richard A. Dixon
Sponsoring Party:	Western Resources, Inc. and Kansas City Power & Light Company
Type of Exhibit:	Supplemental Direct Testimony
Case No.:	EM97-515

IN THE MATTER OF THE

MERGER APPLICATION OF

WESTERN RESOURCES, INC. AND

KANSAS CITY POWER & LIGHT COMPANY

SUPPLEMENTAL DIRECT TESTIMONY

OF

RICHARD A. DIXON

WESTERN RESOURCES, INC.

BEFORE THE PUBLIC SERVICE COMMISSION
OF THE STATE OF MISSOURI

SUPPLEMENTAL DIRECT TESTIMONY
OF
RICHARD A. DIXON
EXECUTIVE DIRECTOR
ELECTRIC TRANSMISSION SERVICES
WESTERN RESOURCES, INC.

CASE NO. EM97-515

I. INTRODUCTION

Q. PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.

A. My name is Richard A. Dixon. My business address is P.O. Box 889, 818 South Kansas Avenue, Topeka, Kansas 66612.

Q. ARE YOU THE SAME RICHARD A. DIXON WHO PREVIOUSLY FILED TESTIMONY IN THIS PROCEEDING?

A. Yes.

Q. WHAT IS THE PURPOSE OF YOUR SUPPLEMENTAL TESTIMONY?

A. The purpose of my supplemental testimony is to provide the Commission with an update on regional transmission developments and to provide information on transmission import capabilities, especially information pertinent to the supplemental direct testimony of Dr. Robert M. Spann on retail market power.

Q. WHAT TRANSMISSION DEVELOPMENTS HAVE OCCURRED SINCE YOU FILED YOU DIRECT TESTIMONY IN MAY, 1997?

A. There are several very significant developments, including implementation of Southwest Power Pool's (SPP) security coordination function, line loading relief

orders that were issued as a result of line outages during the summer of 1997, SPP's completion of a regional transmission tariff, SPP's efforts to develop an independent system operator (ISO) structure, and discussions between SPP and Mid-Continent Area Power Pool (MAPP) to consolidate many of their common activities.

Q. PLEASE DESCRIBE THE SPP SECURITY COORDINATION FUNCTION.

A. In 1997, the SPP became a Security Coordinator under NERC criteria and is now responsible for monitoring the status of the SPP member transmission systems, transmission transactions, system security, and reliability. As such, the SPP is now subject to NERC's interregional line loading relief procedures under which one reliability area may request relief from another reliability area in the event of excessive line loading conditions. The SPP has the authority to seek line loading relief in the form of curtailments, interruptions or schedule holds from SPP members when such interregional relief is requested. In addition, the SPP may seek curtailment, interruption, or schedule holds from members to ease an overloading problem within the SPP.

Q. HOW DO THE NERC AND SPP LINE LOAD RELIEF PROCEDURES AFFECT THE AVAILABILITY OF TRANSMISSION SERVICE?

A. Service availability may be impacted in the interest of maintaining system reliability. For example, a constraint on one transmission system may be relieved by the SPP through curtailment orders to another transmission system. In addition, a constraint in another reliability area, such as in the Mid-Continent Area Power Pool (MAPP) may result in curtailments in the SPP region. Line loading relief is generally of short

duration and is triggered by the overloading of facilities or the sudden loss of generation or transmission facilities in the region. Although the SPP has the authority to curtail all loads, including firm transactions during such conditions, sufficient relief is achieved generally by temporarily curtailing non-firm transactions and/or not allowing new transactions to begin.

Q. HAS LINE LOADING RELIEF BEEN ORDERED BY THE SPP SECURITY COORDINATOR?

A. Yes. The SPP has instituted line loading relief from time to time this past summer at the request of MAPP. In addition, several events occurred this past summer within the SPP that triggered line load relief orders. One of the more significant events was the destruction of approximately 33 miles of 345 kV line between Western Resources and Oklahoma Gas and Electric Company (OGE) by a severe wind storm on June 29, 1997. This line was subsequently rebuilt and placed back in service on September 13, 1997. Several times during this line outage, a second interconnection between Western Resources and OGE overloaded to the point that Western Resources opened the line. In some of those situations, this action caused overloads on the OGE system and OGE requested line load relief from the SPP. In addition to these situations, Public Service Company of Oklahoma (PSO) requested line load relief several times this last summer due to sudden loss of generation and to overloaded facilities.

Q. WHAT ACTION HAS THE SPP REQUIRED DURING LINE LOADING RELIEF?

A. In some cases, the relief requested has been to place a hold on all new transactions that might aggravate the line loading problem during the relief period. In other more severe cases, non-firm transactions have been curtailed or interrupted.

Q. DO YOU EXPECT LINE LOADING RELIEF TO CONTINUE?

A. Line loading relief will continue in the SPP as needed to maintain reliable operations. However, under most circumstances, it is not expected to be of major consequence. This is because the relief will be infrequent and of short duration, driven by the sudden loss of generation or an occasional equipment overload or failure.

Under SPP criteria, utility members construct and maintain their bulk transmission systems to operate without overload in the event of the loss of a single transmission line or transformer. This limits exposure to line loading relief. In addition, the SPP will soon implement procedures that for generation redispatch to avoid curtailing load during an overload condition. Often, the output of a generator can be changed to counter the effects of overloads due to transmission transactions. Obviously, there is a cost to provide this service and the SPP, acting as an intermediary between generators and transmission customers, will arrange for redispatch when it is economical to do so. I anticipate that generators identified as possible solutions to line loading problems will actively seek to participate in this program because it will represent new business opportunities to them. These redispatch procedures will be available on January 1, 1998. In addition to redispatch, the SPP also is studying the transmission systems of its members to identify specific elements of the systems which could be upgraded or for which

special operating procedures could be developed to delay the need to curtail transactions for reliability reasons.

Q. YOUR DIRECT TESTIMONY DESCRIBES THE SPP EFFORTS TO DEVELOP A REGIONAL TRANSMISSION TARIFF. WHAT IS THE STATUS OF THAT EFFORT?

A. The SPP board of directors approved the tariff in October, 1997. SPP plans to file the tariff with the FERC in December, 1997 and to request an effective date of April 1, 1998. Under the tariff, the SPP will act as an agent for transmission owning members and will coordinate all non-firm and short term firm transmission service. The tariff will be applicable to all point-to-point transactions which involve SPP members and for which service is contracted after FERC acceptance of the tariff.

The tariff follows the FERC's requirements for open access tariffs that are required for public utilities as described in Order No. 888 *et. seq.* The pricing methodology is flow-based and distance sensitive, thereby matching the cost of facilities with the use of those facilities. A discussion of the benefits of this methodology is contained in my direct testimony.

Q. YOU STATED IN YOUR DIRECT TESTIMONY THAT SPP MEMBERS WERE NOT PROHIBITED FROM PARTICIPATING IN REGIONAL TARIFFS OUTSIDE THE SPP. IS THAT FLEXIBILITY STILL AVAILABLE?

A. Yes, however the benefits of such participation soon may be available to SPP members without directly joining another regional tariff group. This is because the SPP is seeking reciprocity for its members from other regions. The SPP tariff

permits non-members to use the tariff so long as that non-member is a member of another reliability council and that council permits similar unfettered access by SPP members to that council's regional tariff.

Q. HAS SUCH RECIPROCITY BEEN ACHIEVED?

A. The SPP and MAPP have begun a series of discussions which are intended to identify services that could be provided more economically or reliably on a combined basis. Ultimately, this process could lead to a merger of SPP and MAPP; but for now, the two councils are seeking efficiencies that may be available without a merger. These include, at a minimum, reciprocity with respect to tariff applicability, back up of certain reliability functions, enhanced security coordination and line loading relief, load flow modeling, standardization of operating procedures and possible alignment of ISO functions. These are positive developments as the emphasis is not only on reliability but also on procedures to reliably maintain and increase transmission transactions.

Q. YOU STATED IN YOUR DIRECT TESTIMONY THAT THE SPP WAS ALSO DEVELOPING THE FRAMEWORK FOR AN ISO. HAS PROGRESS BEEN MADE ON THIS EFFORT?

A. Yes. As I testified earlier, the SPP has been directed by its Board of Directors to evaluate and to plan for an ISO. That process began in May, 1997 and has proceeded rapidly through 1997. It is anticipated that a recommendation on the formation of an ISO within the SPP will be made to the Board of Directors early in 1998. The SPP has established a task force of its members to formulate that

recommendation. In addition to numerous meetings and considerable research of other ISOs and of the FERC's orders addressing ISOs, two major workshops were convened during 1997 to receive input not only from the SPP members but also from any other interested party including power marketers, other utilities, industry trade representatives and regulatory bodies. Based on that effort, a set of fundamental principles was developed and approved by the SPP board of directors in November, 1997. The principles are set forth below.

Organizational Structure
An ISO for SPP members should be synonymous with the SPP organization with all reliability, transmission administration, commercial, compliance and administration functions reporting to a single board of directors.

Governance
The SPP ISO should be governed by a hybrid board structure with three sectors containing an equal number of representatives; transmission providers, transmission customers, and disinterested experts. The president should hold one position in the disinterested sector. Sector qualifications and sub-qualifications should be developed to ensure proper balanced representation of all SPP members. Approval of action should require two-thirds majority.

Coordinated Planning
The SPP ISO should actively and openly coordinate regional planning with transmission providers, rather than centrally perform planning.

Constraint Identification and Control
The SPP ISO should perform the full security functionality currently approved and being implemented by SPP.

Regional Network and Long Term Firm Point-to-Point Transmission Service
The SPP ISO should provide regional network service and long term firm point-to-point transmission service under its tariff.

Compliance Monitoring

The SPP ISO staff should actively and openly monitor compliance with SPP and NERC criteria and policies with oversight from an SPP organizational group

Energy Exchange

The SPP ISO should have no involvement in an energy exchange market at this time.

Q. IF THE SPP ALREADY HAS A SECURITY COORDINATOR AND IMPLEMENTS THE REGIONAL TRANSMISSION TARIFF AS PLANNED, WHAT OTHER BENEFITS WILL AN ISO PROVIDE?

A. There are several additional benefits that will be available through an ISO. First, the current SPP regional tariff provides only for non-firm and short term firm transmission service. Also, the generation redispatch function to support non-firm transactions described earlier in this testimony is a voluntary procedure based on economics. For an ISO, the regional tariff will be amended to include long term firm and network transmission service. Integral to these two services, the ISO will have authority to require joint planning and the construction of new transmission facilities to support firm transmission transactions. The ISO will also have the authority to require redispatching of generation to eliminate constraints on the transmission systems of its members.

Second, the ISO will have authority to monitor compliance with SPP and NERC criteria and policies related to administering the regional tariff, security of the interconnected network and reliability of the transmission systems. This authority will include the authority to require compliance and to impose sanctions where necessary.

And third, the ISO will provide an organizational and governance structure that will insure that the ISO's policies, and the administration of those policies, are consistent with the FERC's comparability standards imposed on the electric utility industry.

Q. DOES WESTERN RESOURCES BELIEVE THAT A PROPERLY FORMED ISO WOULD BE BENEFICIAL TO REGIONAL POWER TRANSACTIONS?

A. Yes, and for that reason, Western Resources supports the efforts of the SPP to form an ISO.

Q. DO YOU BELIEVE THAT MOST SPP MEMBERS SUPPORT THE SPP EFFORTS TO DEVELOP REGIONAL PRICING, COORDINATE CERTAIN FUNCTIONS WITH MAPP, AND FORM AN ISO?

A. Yes, there is a high degree of consensus on these matters. After all, the SPP is an organization of its members and its actions should be interpreted as such. This is not to imply, however, that there has been unanimous support of all of the SPP initiatives undertaken. Entergy, the largest SPP member did not support the regional tariff. In addition, Entergy stated that its business interests were aligned more closely with the Southeastern Electric Reliability Council (SERC) than with the SPP, and in late 1997, Entergy notified the SPP that it would terminate its membership in SPP effective December 31, 1997. Associated Electric Cooperative, which is aligned closely with Entergy on these issues, did the same. St. Joseph Light and Power gave notice of termination, not because it was at odds with the SPP initiatives, but

because it felt its business interests were aligned more closely with MAPP than the SPP.

Q. DOES THE EXIT OF THESE MEMBERS AFFECT ADVERSELY THE ABILITY OF THE REMAINING MEMBERS TO OPERATE UNDER THE CURRENT OR ANTICIPATED SPP PROCEDURES?

A. No, in fact, the departure of these SPP members has served as an impetus to hasten the transmission service reforms and developments which I describe in this testimony. In addition, these departures have had the unexpected effect of reducing the rates for transmission service under the regional tariff for transactions among the remaining members and for transactions between SPP and SERC.

Q. IS THE AVAILABILITY OF TRANSMISSION SERVICE IN THE REGION IMPACTED BY THESE EXITING MEMBERS?

A. No. Federal regulations require all public utilities engaged in interstate commerce to provide open access transmission service. The exiting members are subject to these regulations whether or not they are SPP members.

Q. YOU STATED IN YOUR DIRECT TESTIMONY THAT THE TRANSMISSION SYSTEM OF THE MERGED COMPANIES WOULD BE OPERATED AS AN INTEGRATED SYSTEM. IS THERE ADEQUATE TRANSFER CAPABILITY BETWEEN WESTERN RESOURCES AND KCPL TO ACCOMMODATE JOINT DISPATCH OF GENERATION UNITS AS WELL AS TO PROVIDE FOR FIRM TRANSMISSION TRANSACTIONS OCCURRING ON THE TWO SYSTEMS?

A. Yes. The thermal capacity of the interconnections between Western Resources and KCPL is over 5,500 megawatts (MW). Although the transfer capability is not nearly that high, it is sufficient to accommodate joint dispatch of generation units and firm transmission transactions occurring on the two systems. This would be true even if all of Western Resources' and KCPL's total pre-merger wholesale load requirements were supplied by off-system power purchases and transported over these interconnections.

Q. IS THERE ADEQUATE TRANSFER CAPABILITY WITH NEIGHBORING TRANSMISSION SYSTEMS TO IMPORT ALL OF THE FIRM LOAD REQUIREMENTS OF WESTERN RESOURCES' AND KCPL'S WHOLESALE CUSTOMERS?

A. Yes; however, as a group, those load requirements are not large.

Q. IS THERE ADEQUATE TRANSFER CAPABILITY WITH NEIGHBORING TRANSMISSION SYSTEMS TO ALSO IMPORT ALL OF THE LOAD REQUIREMENTS OF WESTERN RESOURCES' AND KCPL'S RETAIL CUSTOMERS IN THE EVENT OF RETAIL WHEELING?

A. No; however, this condition exists with or without a merger between Western Resources and KCPL. Moreover, this condition also exists for most if not all of the other utilities under the Commission's jurisdiction.

Western Resources has almost 10,000 MW of thermal capacity through its interconnections with other utilities while KCPL has nearly 15,000 MW. The load requirements, however, are only about 4,000 MW and 3,000 MW respectively. Even

though the sum of the thermal limits between Western Resources and KCPL and the systems with which they are interconnected exceeds the load requirements of the two utilities, the laws of physics will not permit the load to be served solely from off-system generation. This is because, as generation within Western Resources' or KCPL's control area or within the merged entity's control area is reduced, power immediately begins to flow into the control area from generators located in other control areas; however, there is a limit on the amount of power that can be imported. This is because it is not possible to direct that a certain amount of the power enter the area at point A and another amount enter at point B. As stated in my direct testimony, power flows according to the laws of physics, not contract paths. Thus, eventually, as more and more power is imported, a limit will be reached on some piece of equipment such as a transmission conductor, power transformer, disconnect switch, etc. At that point, no more power can enter the system without damaging equipment. This is true even though there may be plenty of spare thermal capacity at some other point of interconnection.

Q. HAVE THE APPLICANTS ESTIMATED THE IMPORT CAPABILITIES OF THEIR SYSTEMS ON EITHER A STAND-ALONE OR A MERGED BASIS?

A. Yes. First contingency incremental transfer capability (FCITC) studies were conducted under my direction to evaluate import capabilities under varying internal generation assumptions. The base case for this study effort is the 1998 summer peak case used by SPP in its available transfer capability (ATC) calculations. The SPP regularly calculates ATC values for its members which then are posted on the

SPP's open access same time information system (OASIS) for access by potential transmission customers. The transfer studies use the base case data under varying assumptions and the results of the transfer studies as compared to the base case become the FCITC amounts.

The first step in a transfer study is to identify the power transfer source (generator) and sink (load). For SPP analyses, these sources and sinks are represented by all of the generation located within one control area and all load located within another control area. The next step is to gradually increase load in one control area, which may be represented as a reduction in generation in that control area, while at the same time increasing output from the generation source in the sending control area. At this point, the resultant power flows are different than those in the base case. In the process of decreasing generation in one control area and increasing generation in another control area, single component outages (first contingencies) are simulated on various segments of the transmission systems of the SPP members. For each of these single contingencies, the model then evaluates all other components of the transmission systems that are contained in the model for overloads or other unsatisfactory conditions. Unsatisfactory in this context refers to an overloaded facility that is carrying at least three percent of the power transfer. Overloaded facilities that carry less than three percent of the transfer are ignored. The process continues until the transfer of power has increased to a point that under first contingency conditions, an overload is experienced. The amount of the transfer,

in megawatts, at that point is said to be the FCITC amount between the two control areas being studied.

Q. HOW ARE THE INDIVIDUAL GENERATION UNITS WITHIN A CONTROL AREA MODELED BY THE SPP?

A. At the direction of the control area operator, certain generation may be excluded from the effects of scaling to meet load changes. For example, Wolf Creek is included in the base and transfer cases at the same generation level because it is not available to follow load. Other selected units in a control area are increased or decreased on a proportionate basis even though they would not be operated in that manner. Nevertheless, on a "big picture" basis in modeling the entire SPP region, this method yields results that, if not precise, are reasonably accurate for the purpose of estimating transfer capabilities between control areas. I refer to this method of modeling as the SPP method of generation dispatch. The Applicants studied FCITC for imports under this method for the Western Resources system, the KCPL system and for the combined systems. The results of these studies show net import capabilities for Western Resources of 887 MW, for KCPL of 1,644 MW and for the merged entity of 1,606 MW.

Q. ARE THERE OTHER WAYS TO MODEL GENERATION WHEN ESTIMATING IMPORT CAPABILITY?

A. Yes. Any number of assumptions may be made with respect to generation, each of which may give different results. The goal, however, is to model generation in a way that approximates the manner in which it is actually dispatched to satisfy load

changes. One such method is to assume that the generation is dispatched on an economic basis solely on the basis of incremental or decremental costs. Under this method, discrete generation within a control area is increased or decreased based on cost although there may be some units that are required to be operated to maintain voltage within acceptable limits during peak periods. The resultant power flows into or out of a control area are different when dispatching on an economic basis than when dispatching by the SPP method discussed above. This is because the individual generating units are located on different parts of the transmission system and the transmission system will respond accordingly. The Applicants studied FCITC for imports under the economic dispatch method with the results these studies show net import capability for Western Resources of 581 MW, KCPL of 2,016 MW and for the merged entity of 704 MW.

Another method of generation dispatch is to control individual units in such a manner that import capability is maximized without regard to generation cost or operating realities. Net import capability results of this method, along with the results of the other two methods are shown in the following table.

Net Import Capabilities
(MW)

	Control Area		
Dispatch Method	Western Resources	KCPL	Combined
SPP	887	1,644	1,606
Economic	581	2,016	704
Maximize Imports	1,887	2,414	1,606

Note: Net Import Capability = FCITC + Base case imports - Base case exports

Q. WHAT DO THE STUDY RESULTS CONTAINED IN THIS TABLE REVEAL?

A. Before discussing the above table, I need to qualify the study results. First, it is important to remember that these studies represent incremental transfer capability with respect to the estimated system configuration under forecasted peak conditions for 1998. Thus, the base case itself contains certain assumptions that are intended to represent expected operations. It is not a model of actual operations.

Second, the model results are only as good as the underlying data. Although every reasonable attempt is made to model the SPP system components in a thorough and consistent manner, the base model is the product of a working group of SPP members and there are likely to be some inconsistencies in exactly what facilities are included and how those facilities are rated for normal and emergency operations. In addition certain assumptions must be made with respect to some of the smaller systems included in the model. Notwithstanding these shortcomings, the SPP method provides a good representation of the SPP transmission systems, and other interconnected systems as applicable, for the purposes intended.

And third, the results of the transfer cases shown in the above table are subject to the same qualifications applicable to the base case. In addition, the results depend heavily on the assumptions regarding generation dispatch. As in the base case, the transfer cases do not represent actual operations. Instead, they are intended to be a tool with which to estimate the transfer capabilities in such a way that one can forecast results under reasonably expected actual conditions.

Q. CAN YOU GENERALIZE THE STUDY RESULTS?

A. My first conclusion is that the SPP method, although somewhat illustrative, may not provide the best estimate of net import capability simply because not all generation that is included in the model is permitted by the various control area operators to be used for modeling transfer cases. Instead, only enough generation is included to effect control area to control area transfers being studied by the SPP. When evaluating import capability, it is important to include all of the generation. Moreover, the SPP method does not recognize the ability of a utility to individually dispatch units within its control area.

The other two cases estimate net import capability from the perspective of dispatching generation to minimize generation costs or dispatching generation to maximize import capability without regard to generation costs. These two cases may be useful in estimating the upper and lower bounds of expected operations. However, it is important to point out once again that the study results are based on a single peak hour configuration and import capabilities would be expected to increase significantly in other hours of the year. In addition, because the studies are FCITC studies, it must be remembered that a transmission component critical to the transfer (the first contingency) is "removed from service" and then the transfer limit is determined. Obviously, under actual conditions, especially during peak hours, these critical elements are not allowed to be removed from service and, barring a force majeure event, they will support transfer capabilities much larger than those shown in the table above.

Q. ARE THERE WAYS TO INCREASE THE AMOUNT OF IMPORT CAPABILITY INTO A CONTROL AREA?

A. One of the best ways is to increase the output of internal generation for sale to customers outside the control area. Another way is to dispatch units strategically within the control area in such a way that power flows are altered and additional imports may be made. This is very similar to the generation redispatch that I described earlier which is being implemented by the SPP. Another possibility would be to construct additional generation within the control area. Another way to increase import capability is to upgrade overloaded facilities or system components or to construct new transmission facilities. In many cases, these various actions may be justified by the economics of the pending power transaction.

Q. WHAT EMPHASIS DO YOU BELIEVE THE COMMISSION SHOULD PLACE ON THE IMPORT CAPABILITY STUDY?

A. This information is pertinent to Dr. Spann's retail market power analysis; however, because the Commission is not considering this proceeding under an approved retail wheeling program, the information may be more instructive than critical to this proceeding. In other words, the need for greater import capability than described above simply does not exist at this time. I believe it is adequate for the Commission to conclude that the merger will have no adverse impact on the import capabilities that currently exist for Western Resources or KCPL. I also believe that the Commission should continue to participate in regional transmission issues being

addressed by the SPP, some of which may relate directly to increasing transfer capabilities.

Q. THANK YOU.

AFFIDAVIT OF RICHARD A. DIXON

STATE OF)
) ss.
COUNTY OF)

Richard A. Dixon of lawful age, on his oath, states that he has participated in the preparation of the foregoing direct testimony in question-and-answer form to be presented in the above case; that he prepared the attached schedules; that the answers in the foregoing direct testimony were given by him; that he has knowledge of the matters set forth in such answers and schedules, and that such matters are true and correct to the best of his knowledge and belief.

Richard A. Dixon

Subscribed and sworn to before me this 12th day of December, 1997.

NOTARY PUBLIC - State of Kansas
FAITH BEASLEY
My Appt. Exp.

Notary Public

My Commission expires November 18, 2000

STUDY OF SIMULTANEOUS IMPORTS

If ATC calculations use SPP method of generation dispatch:

		Combined System		KCPL		WERE	
		Base Case	Transfer Case	Base Case	Transfer Case	Base Case	Transfer Case
(1)	Generation	8274	6349	3034	1484	5239	3939
(2)	Load+Losses	7955	7955	3128	3128	4826	4826
(1-2)	Net Interchange	319	-1606	-94	-1644	413	-887
(5)	FCITC	-	1925	-	1550	-	1300
(6)	Firm Transfers, Imports	639	639	1070	1070	799	799
(7)	Firm Transfers, Exports	958	958	976	976	1212	1212
(5+6)	FCTTC	-	2564	-	2620	-	2099
(2-5-6)	Minimum Generation	7316	5391	2058	508	4027	2727
(2-5-6+7)	Min.Gen. w/Exports	8274	6349	3034	1484	5239	3939

If ATC calculations use economic generation dispatch:

		Combined System		KCPL		WERE	
		Base Case	Transfer Case	Base Case	Transfer Case	Base Case	Transfer Case
(1)	Generation	8274	7251	3034	1112	5239	4245
(2)	Load+Losses	7955	7955	3128	3128	4826	4826
(1-2)	Net Interchange	319	-704	-94	-2016	413	-581
(5)	FCITC	-	1023	-	1922	-	990
(6)	Firm Transfers, Imports	639	639	1070	1070	799	799
(7)	Firm Transfers, Exports	958	958	n/a [1]	n/a [1]	1212	1212
(5+6)	FCTTC	-	1662	-	2992	-	1789
(2-5-6)	Minimum Generation	7316	6293	2058	136	4027	3037
(2-5-6+7)	Min.Gen. w/Exports	8274	7251			5239	4249

If ATC calculations use generation dispatch for maximum ATC value:

		Combined System		KCPL		WERE	
		Base Case	Transfer Case	Base Case	Transfer Case	Base Case	Transfer Case
(1)	Generation	8274	6349	3034	714	5239	2939
(2)	Load+Losses	7955	7955	3128	3128	4826	4826
(1-2)	Net Interchange	319	-1606	-94	-2414	413	-1887
(5)	FCITC	-	1925	-	2320	-	2300
(6)	Firm Transfers, Imports	639	639	1070	1070	799	799
(7)	Firm Transfers, Exports	958	958	n/a [1]	n/a [1]	n/a [1]	n/a [1]
(5+6)	FCTTC	-	2564	-	3390	-	3099
(2-5-6)	Minimum Generation	7316	5391	2058	-262	4027	1727
(2-5-6+7)	Min.Gen. w/Exports	8274	6349				

Notes:

1. Firm exports (the co-owner generation portion) needed to be decreased in order to create the transfer.
2. The assumption is made that losses remain constant in all cases, so Load+Losses is constant. Actually, losses change every time generation dispatch is modified. The change is not significant, and the assumption is made to simplify the summary.

STUDY OF SIMULTANEOUS IMPORT CAPABILITY

WERE

BUS #	NAME	Base Case Gen.	TRANSFER CASES OPTION 1 Scale Gen. (SPP Method)	OPTION 2 Maximum Import	OPTION 3 Economic Dispatch
6551	AEC GT1	0	0	0	0
6553	EEC U1	120	89	83	0
6554	EEC U2	344	254	224	0
6556	GEC U1	0	0	22	0
6557	GEC U2	0	0	38	0
6558	GEC U3	90	67	58	0
6559	GEC U4	90	67	58	0
6561	HEC U1	0	0	18	15
6562	HEC U2	15	15	17	25
6563	HEC U3	25	18	28	0
6564	HEC U4	175	129	197	197
6565	HEC GT1	45	33	51	50
6566	HEC GT2	45	33	49	50
6567	HEC GT3	45	33	54	50
6568	HEC GT4	0	0	78	78
6570	JEC U1	675	500	179	631
6571	JEC U2	675	500	179	629
6572	JEC U3	675	499	179	630
6575	LEC U3	50	37	13	0
6576	LEC U4	105	78	28	0
6577	LEC U5	343	254	91	343
6579	MCPH PLT	26	19	26	26
6580	MCPHGT1	45	33	50	50
6581	MCPHGT2	45	45	50	50
6582	MCPHGT3	45	33	50	50
6585	NEC U3	60	60	0	60
6587	TEC U7	70	52	45	0
6588	TEC U8	120	89	83	0
6589	TEC GT	0	0	0	0
6595	WCGS U1	1185	876	864	1185
6807	6TH ST 3	1	1	1	1
7010	WELLING2	9	9	9	9
7011	WINFLD 2	24	24	24	24
7017	AUGUSTA2	17	17	17	17
7026	GETTY 2	35	35	35	35
7050	BURLING2	7	7	7	7
7056	CHANUTE2	21	21	21	21
7062	IOLA 2	1	1	1	1
7114	NEODESH2	1	1	1	1
7125	SUB A 2	9	9	9	9
7221	MULVANE2	1	1	1	1
	TOTAL GEN	5239	3939	2938	4245
	FCITC			2300	140
	LOAD	4826	4826	4826	4826
	NET IMPORT	413	-887	-1888	-581

Firm Transfers in Base Case:

	ID	Firm Exports Contract	JOU	Firm Imports Contract	JOU	
SWPA	1			92		
OMPA	1	57				
MIDW	1	125				
MIDW	2	44				
WEPL	1		166			JEC
WEPL	2			2		
WEPL	3	14				
MIPU	1		168			JEC
KCPL	1			10		
KCPL	2		548			WC
KCPL	3				672	LaCygne
KACY	1			23		
EMDE	1	30				
EMDE	2	60				
Total:		330	882	127	672	
		= 1212		= 799		

Net Int. = Exports - Imports = **413**

Limiting Elements:
Option 1: Midtown-Leeds 161 kV
Option 2: Midtown-Leeds 161 kV
Option 3: Low voltages west of Hutchinson

4826(LOAD) - 1300(FCITC) - (92+2+10+672+23)BASE IMPORTS = 2727(NET LOAD REMAINING)

2727+(166+168+548)JOU EXPORT+(57+125+44+14+30+60)BASE EXPORTS=3939(NET TRANSFER GEN)

4826(LOAD) - 3939(NET TRANSFER GEN) = 887(NET IMPORT TOTAL TRANSFER CAPABILITY)

STUDY OF SIMULTANEOUS IMPORT CAPABILITY

KCPL

BUS #	NAME	BASE CASE GENERATION	OPTION 1 GENERATION SCALING TRANSFER CASE	OPTION 2 MAXIMUM IMPORT TRANSFER CASE	OPTION 3 ECONOMIC DISPATCH TRANSFER CASE
7651	HAW G5 1	460	284	460	450
7652	MONTG1 1	130	51	0	0
7653	MONTG2 1	130	51	0	0
7654	MONTG3 1	136	57	0	0
7655	LAC G1 1	682	335	0	0
7656	LAC G2 1	662	314	170	331
7657	IAT G1 1	670	318	0	331
7659	NE CTN 1	0	0	0	0
7660	GA CT 1	0	0	0	0
7661	HAW CT 1	120	47	84	0
7662	NE CTS 1	0	0	0	0
7744	MOONLT 5	10	10	0	0
7798	CTY HIG2	34	17	0	0
	TOTAL GEN	3034	1484	714	1112
	FCITC		1550 HAW XFMR LIMIT	2320 UE LIMIT	1922 HAW XFMR LIMIT
	LOAD		3128	3128	3128
	NET IMPORT		1644	2414	2016

	ID	INTRCHG MW	JOU MW
SWPA	1	-5	
WERE	1	10	
WERE	2	-548	-548
WERE	3	672	672
MIPU	1	3	
KACY	1	-17	
STJO	1	151	121
EMDE	1	80	80
INDN	1	60	
ASEC	1	-500	
	TOTAL	-94	325

3128(LOAD) - 1550(FCITC) - (500+548+17+5)BASE IMPORTS = 508(NET LOAD REMAINING)

508 + (201+672)GEN EXPORT JOU + (10+3+30+60)BASE EXPORTS = 1484(NET TRANSFER GEN)

3128(LOAD) - 1484(NET TRANSFER GEN) = 1644(NET IMPORT)

STUDY OF SIMULTANEOUS IMPORT CAPABILITY

MERGED AREA

BUS #	NAME	BASE CASE GENERATION	OPTION 1 GENERATION SCALING TRANSFER CASE	OPTION 2 MAXIMUM IMPORT TRANSFER CASE	OPTION 3 ECONOMIC DISPATCH TRANSFER CASE
6551	AEC GT1	0	0	0	0
6553	EEC U1	130	90	90	0
6554	EEC U2	350	242	242	350
6556	GEC U1	35	24	24	0
6557	GEC U2	60	42	42	0
6558	GEC U3	90	62	62	0
6559	GEC U4	90	62	62	0
6561	HEC U1	13	9	9	0
6562	HEC U2	0	0	0	0
6563	HEC U3	20	14	14	0
6564	HEC U4	175	121	121	0
6565	HEC GT1	40	28	28	0
6566	HEC GT2	40	28	28	0
6567	HEC GT3	40	28	28	0
6568	HEC GT4	0	0	0	0
6570	JEC U1	675	468	468	675
6571	JEC U2	675	468	468	675
6572	JEC U3	675	468	468	675
6575	LEC U3	50	35	35	50
6576	LEC U4	100	69	69	100
6577	LEC U5	355	241	241	355
6579	MCPH PLT	20	14	14	0
6580	MCPHGT1	40	28	28	0
6581	MCPHGT2	0	0	0	0
6582	MCPHGT3	40	28	28	0
6585	NEC U3	0	0	0	0
6587	TEC U7	70	48	48	70
6588	TEC U8	130	90	90	130
6589	TEC GT	30	25	25	0
6595	WCGS U1	1185	1185	1185	1185
7651	HAW G5 1	450	364	364	450
7652	MONTG1 1	140	97	97	140
7653	MONTG2 1	140	97	97	140
7654	MONTG3 1	140	97	97	140
7655	LAC G1 1	660	515	515	660
7656	LAC G2 1	660	515	515	660
7657	IAT G1 1	670	510	510	670
7659	NE CTN 1	0	0	0	0
7660	GA CT 1	0	0	0	0
7661	HAW CT 1	130	90	90	0
7662	NE CTS 1	0	0	0	0
7744	MOONLT 5	0	0	0	0
7798	CTY HIG2	30	21	21	0
	OTHER	126	126	126	126
	TOTAL GEN	8274	6349	6349	7251
	FCITC		1925 UE LIMIT	1925 UE LIMIT	1023 CESW/OGE LIMIT
	LOAD		7955	7955	7955
	NET IMPORT		1606	1606	704

STUDY OF SIMULTANEOUS IMPORT CAPABILITY

	ID	INTRCHG MW	JOU MW
SWPA	1	-5	
SWPA	2	-92	
OMPA	1	57	
MIDW	1	125	
MIDW	2	44	
WEPL	1	166	166
WEPL	2	-2	
WEPL	3	14	
MIPU	1	3	
MIPU	2	168	168
KACY	1	-17	
KACY	2	-23	
STJO	1	151	121
EMDE	1	80	80
EMDE	2	60	
EMDE	3	30	
INDN	1	60	
ASEC	1	-500	
	TOTAL	319	535