EVERGY

2020 Analysis of System Losses

December 2021

Prepared by:

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December 20, 2021

Ms. Linda Nunn
Manager, Regulatory Affairs
Evergy
818 South Kansas Avenue
Topeka, KS 66612

RE: 2020 LOSS ANALYSIS – EVERGY

Dear Ms. Nunn:

Transmitted herewith are the results of the 2020 Analysis of System Losses for the Evergy power system consisting of Evergy Metro (MO and KS) and Missouri West. Our analysis develops cumulative expansion factors (loss factors) for both demand (peak/kW) and energy (average/kWh) losses by discrete voltage levels applicable to metered sales data. Our analysis considers only technical losses in arriving at our final recommendations.

On behalf of MAC, we appreciate the opportunity to assist you in performing the loss analysis contained herein. The level of detailed load and sales data by voltage level, coupled with the FERC-approved transmission loss factors, forms the foundation for determining reasonable and representative power losses on the Evergy system. Our review of these data and calculated loss results support the proposed loss factors as presented herein for your use in various cost of service, rate studies, and demand analyses.

Should you require any additional information, please let us know at your earliest convenience.

Sincerely,

Paul M. Normand
Principal

Enclosure
PMN/rjp

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1.0 EXECUTIVE SUMMARY

This report presents Evergy's 2020 Analysis of System Losses for the power systems as performed by Management Applications Consulting, Inc. (MAC). The study developed separate demand (kW) and energy (kWh) loss factors for each voltage level of service in the power system for Evergy consisting of Metro MO, Metro KS, Metro combined, and MO West. The cumulative loss factor results by voltage level, as presented herein, can be used to adjust metered kW and kWh sales data for losses in performing cost of service studies, determining voltage discounts, and other analyses which may require a loss adjustment.

The procedures used in the overall loss study emphasized the use of "in house" resources where possible. Extensive use was made of the Company's transformer plant investments in the model. In addition, measured and estimated load data provided a means of calculating reasonable estimates of losses by using a "top-down" and "bottom-up" procedure. In the "top-down" approach, losses from the high voltage system, through and including distribution substations, were estimated along with transformer loss estimates and metered data.

At this point in the analysis, system loads and losses at the input into the distribution substation system are known with reasonable accuracy. However, it is the remaining loads and losses on the distribution substations, primary system, secondary circuits, and services which are generally difficult to estimate. Estimated Company load data provided the starting point for performing a "bottom-up" approach for calculating the remaining distribution losses. Basically, this "bottom-up" approach develops loadings by first determining loads and losses at each level beginning at a customer's meter service entrance and then going through secondary lines, line transformers, primary lines, and finally distribution substation. These distribution system loads and associated losses are then compared to the initial calculated input into Distribution Substation loadings for reasonableness prior to finalizing the loss factors. An overview of the loss study is shown on Figure 1.

Table 1, below, provides the final results from Appendix A for the 2020 calendar year. Exhibits 8 and 9 of Appendix A present a more detailed analysis of the final calculated summary results of losses by voltage segments and delivery service level in the Company's power system. These Table 1 cumulative loss expansion factors are applicable only to metered sales at the point of receipt for adjustment to the power system's input level. A separate Metro combined loss factor was also calculated on Exhibit 10 (Appendices A and B) which combines the separate loss factors from the Evergy Metro MO and Metro KS loss results on a load weighted basis.

TABLE 1
Loss Factors at Sales Level, Calendar Year 2020

Voltage Level of Service	Metro-MO Total (Appendix A)	Metro-KS Total (Appendix B)	Metro Composite	MO West Total (Appendix C)
Demand (kW)				
Transmission[1]	1.03000	1.03000	1.03000	1.03000
Substation	1.03709	1.03587	1.03694	1.03724
Primary Lines	1.05865	1.05695	1.05786	1.05618
Secondary	1.07994	1.07642	1.07822	1.08050
Energy (kWh)				
Transmission[1]	1.03000	1.03000	1.03000	1.03000
Substation	1.03776	1.03762	1.03775	1.03880
Primary Lines	1.04965	1.05008	1.04982	1.05026
Secondary	1.06899	1.07116	1.06997	1.07664
Losses – Net System Input[2]	6.09% MWh 7.14% MW	6.51% MWh 7.01% MW		6.69% MWh 7.16% MW
Losses – Net System Output[3]	6.49% MWh 7.69% MW	6.97% MWh 7.54% MW		7.17% MWh 7.71% MW

The net system input shown in Table 1 is the MWh losses of 6.09% for the total Evergy MO load using calculated losses divided by the total input energy to the system. The 6.49% represents the same MWh losses using system output instead of input as a reference. The net system input reference shown in Table 1 represents MW losses of 7.14% and 7.69% represents these MW losses at output. These results use the appropriate total losses for each but are divided by system output or sales. These calculations are all based on the data and results shown on Exhibits 1, 7 and 9 of each study.

Variable losses are primarily a function of equipment loading levels for a peak load hour, the loss factor derivations for any voltage level must consider both the load at that level plus the loads from lower voltages and their associated losses. As a result, cumulative losses on losses equates to additional load at higher levels along with future changes (+ or –) in loads throughout the power system. It is important to recognize that losses are multiplicative in nature (future) and not additive (test year only) for all future years to ensure total recovery.

[1] Reflects results for 345 kV, 138 kV, and 69 kV.
[2] Net system input equals firm sales plus losses, Company use less non-requirement sales and related losses. See Appendix A, Exhibit 1, for their calculations.
[3] Net system output uses losses divided by output or sales data as a reference.

The derivation of the cumulative loss factors shown in Table 1 have been detailed for all electrical facilities in Exhibit 9, page 1 for demand and page 2 for energy for all Appendices. Beginning on line 1 of page 1 (demand) under the secondary column, metered sales are adjusted for service losses on lines 3 and 4. This new total load (with losses) becomes the load amount for the next higher facilities of secondary conductors and their loss calculations. This process is repeated for all the installed facilities until the secondary sales are at the input level (line 45). The final loss factor for all delivery voltages using this same process is shown on line 46 and Table 1 for demand. This procedure is repeated in Exhibit 9, page 2, for the energy loss factors.

The loss factor calculation is simply the input required (line 45) divided by the metered sales (line 43).

An overview of the loss study is shown on Figure 1 on the next page. Figure 2 simply illustrates the major components that must be considered in a loss analysis.

Figure 1

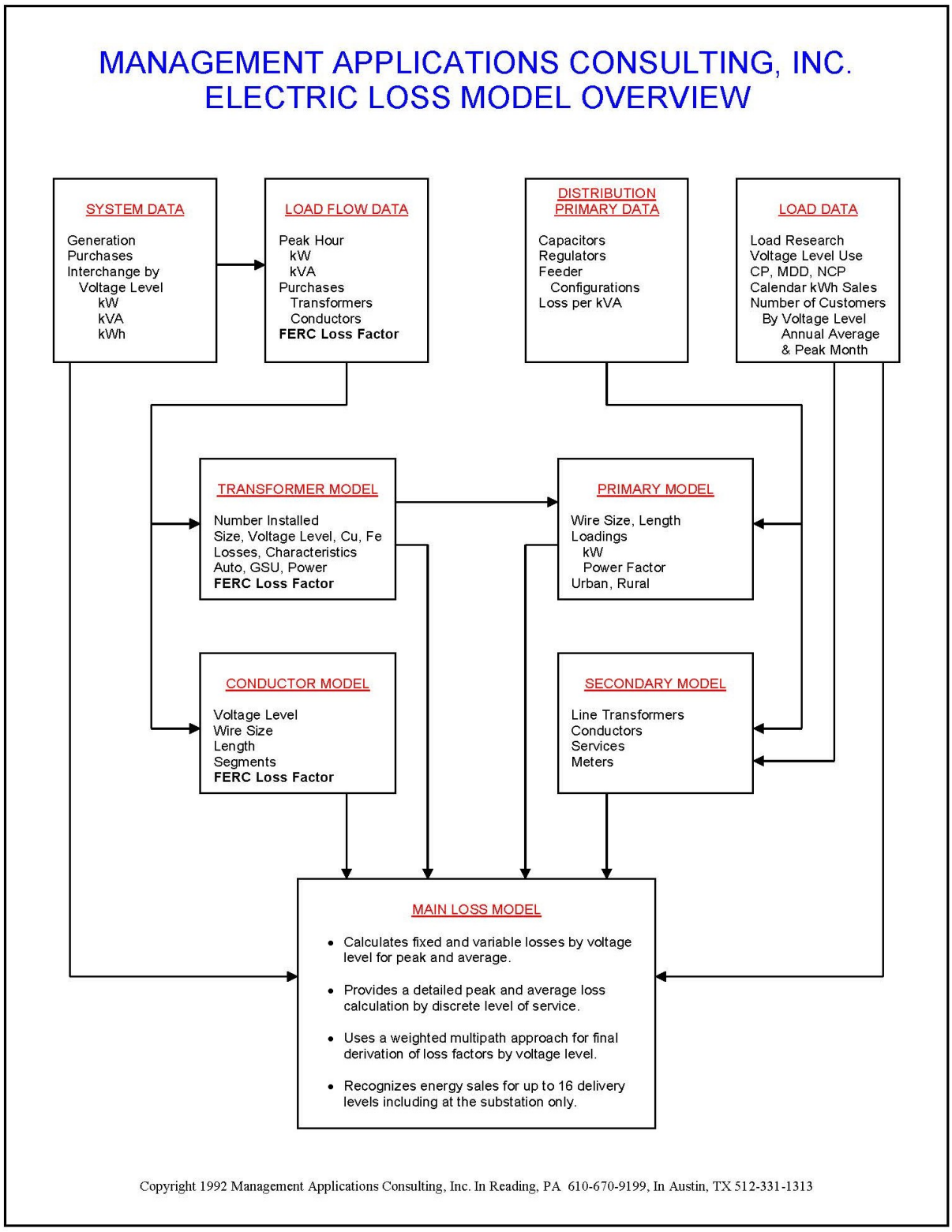
MANAGEMENT APPLICATIONS CONSULTING, INC.
ELECTRIC LOSS MODEL OVERVIEW
SYSTEM DATA
Generation
Purchases
Interchange by
Voltage Level
kW
kVA
kWh
LOAD FLOW DATA
Peak Hour
kW
kVA
Purchases
Transformers
Conductors
FERC Loss Factor
DISTRIBUTION PRIMARY DATA
Capacitors
Regulators
Feeder
Configurations
Loss per kVA
LOAD DATA
Load Research
Voltage Level Use
CP, MDD, NCP
Calendar kWh Sales
Number of Customers
By Voltage Level
Annual Average
& Peak Month
TRANSFORMER MODEL
Number Installed
Size, Voltage Level, Cu, Fe
Losses, Characteristics
Auto, GSU, Power
FERC Loss Factor
PRIMARY MODEL
Wire Size, Length
Loadings
kW
Power Factor
Urban, Rural
CONDUCTOR MODEL
Voltage Level
Wire Size
Length
Segments
FERC Loss Factor
SECONDARY MODEL
Line Transformers
Conductors
Services
Meters
MAIN LOSS MODEL
Calculates fixed and variable losses by voltage level for peak and average.
Provides a detailed peak and average loss calculation by discrete level of service.
Uses a weighted multipath approach for final derivation of loss factors by voltage level.
Recognizes energy sales for up to 16 delivery levels including at the substation only.
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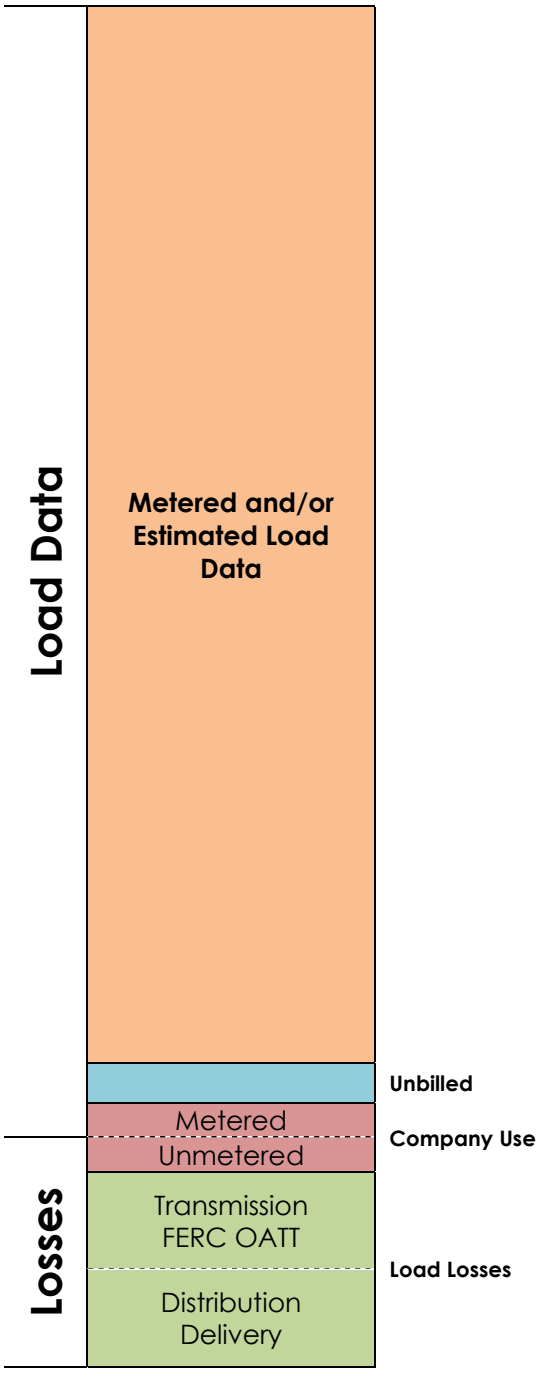
Figure 2
Major Energy and Loss Components



2.0 INTRODUCTION

This report of the 2020 Analysis of System Losses for the Evergy power system provides a summary of results, conceptual background or methodology, description of the analyses, and input information related to the study.

2.1 Conduct of Study

Typically, between five to ten percent of the total peak hour MW and annual MWH requirements of an electric utility is lost or unaccounted for in the delivery of power to customers. Investments must be made in facilities which support the total load which includes losses or unaccounted for load. Revenue requirements associated with load losses are an important concern to utilities and regulators in that customers must equitably share in all of these cost responsibilities. Loss expansion factors by voltage level are the mechanism by which customers' metered demand and energy data are mathematically adjusted to the generation or input level (point of reference) when performing cost and revenue calculations.

An acceptable accounting of losses can be determined for any given time period using available engineering, system, and customer data along with empirical relationships. This loss analysis for the delivery of demand and energy utilizes such an approach. A microcomputer loss model[4] is utilized as the vehicle to organize the available data, develop the relationships, calculate the losses, and provide an efficient and timely avenue for future updates and sensitivity analyses. Our procedures and calculations are similar with prior loss studies, and they rely on numerous databases that include customer statistics and power system investments at various voltage levels of service.

Company personnel performed most of the data gathering and data processing efforts and checked for reasonableness. MAC provided assistance as necessary to construct databases, transfer files, perform calculations, and check the reasonableness of results. Efforts in determining the data required to perform the loss analysis centered on information which was available from existing studies or reports within the Company. From an overall perspective, our efforts concentrated on five major areas:

1. System information concerning peak demand and annual energy requirements by voltage level,
2. High voltage power system analysis not required as using FERC-approved loss factors,
3. Distribution system primary and secondary loss calculations,
4. Derivation of fixed and variable losses by voltage level, and
5. Development of final cumulative expansion factors at each voltage for peak demand (kW) and annual energy (kWh) requirements at the point of delivery (meter).

[4]Copyright by Management Applications Consulting, Inc.

2.2 Electric Power Losses

Losses in power systems consist of primarily technical losses with a much smaller level of non-technical losses.

Technical Losses

Electrical losses result from the transmission of energy over various electrical equipment. The largest component of total losses during peaking conditions is power dissipation as a result of varying loading conditions and are oftentimes called load losses which are mostly related to the square of the current (I^2R). These peak hour losses can be very high percent of all technical losses during peak loading conditions. The remaining losses are called no-load and represent essentially fixed (constant) energy losses throughout the year. These no-load losses represent energy required to energize various electrical equipment regardless of their loading levels over the entire year. The major portion of these no-load losses consist of core or magnetizing energy related to installed transformers throughout the power system and generates the major component of annual losses on any distribution system.

The following Tables 2, 3, and 4 summarize the unadjusted fixed and variable losses by major functional categories from Exhibit 5 of Appendices A, B, and C:

TABLE 2 – METRO MO

	DEMAND (PEAK HOUR – MW)			ENERGY (ANNUAL AVERAGE – MWH)		
	FIXED	VARIABLE	TOTAL	FIXED	VARIABLE	TOTAL
TRANS	6.05	44.35	50.40	53,121	197,364	250,485
(%)	12.00%	88.00%	100.00%	21.21%	78.79%	100.00%
SUBTRANS	0.00	0.00	0.00	0.00	0.00	0.00
(%)	N/A	N/A	N/A	N/A	N/A	N/A
DIST SUBS	5.13	3.60	8.73	45,080	12,373	57,453
(%)	58.76%	41.24%	100.00%	78.46%	21.54%	100.00%
PRIMARY	2.54	22.84	25.38	22,290	61,348	83,638
(%)	10.00%	90.00%	100.00%	26.65%	73.35%	100.00%
SECONDARY	10.62	12.24	22.86	93,328	28,028	121,357
(%)	46.48%	53.52%	100.00%	76.90%	23.10%	100.00%
TOTAL SYS	24.34	83.02	107.37	213,819	299,114	512,933
(%)	22.67%	77.33%	100.00%	41.69%	58.31%	100.00%
TOTAL DIST	18.29	38.68	56.97	160,698	101,749	262,447
(%)	32.11%	67.89%	100.00%	61.23%	38.77%	100.00%

TABLE 3 – METRO KS

	DEMAND (PEAK HOUR – MW)			ENERGY (ANNUAL AVERAGE – MWH)		
	FIXED	VARIABLE	TOTAL	FIXED	VARIABLE	TOTAL
TRANS	5.50	40.37	45.87	48,355	143,878	192,233
(%)	12.00%	88.00%	100.00%	25.15%	74.85%	100.00%
SUBTRANS	0.00	0.00	0.00	0.00	0.00	0.00
(%)	N/A	N/A	N/A	N/A	N/A	N/A
DIST SUBS	4.25	3.55	7.80	37,362	9,442	46,804
(%)	54.54%	45.46%	100.00%	79.83%	20.17%	100.00%
PRIMARY	2.72	24.48	27.20	23,888	50,833	74,721
(%)	10.00%	90.00%	100.00%	31.97%	68.03%	100.00%
SECONDARY	10.45	12.63	23.08	91,770	22,946	114,716
(%)	45.27%	54.73%	100.00%	80.00%	20.00%	100.00%
TOTAL SYS	22.93	81.02	103.95	201,374	227,100	428,475
(%)	22.06%	77.94%	100.00%	47.00%	53.00%	100.00%
TOTAL DIST	17.42	40.65	58.07	153,020	83,222	236,242
(%)	30.00%	70.00%	100.00%	64.77%	35.23%	100.00%

TABLE 4 – MO WEST

	DEMAND (PEAK HOUR – MW)			ENERGY (ANNUAL AVERAGE – MWH)		
	FIXED	VARIABLE	TOTAL	FIXED	VARIABLE	TOTAL
TRANS	6.45	47.28	53.73	56,635	193,356	249,991
(%)	12.00%	88.00%	100.00%	22.65%	77.35%	100.00%
SUBTRANS	0.00	0.00	0.00	0.00	0.00	0.00
(%)	N/A	N/A	N/A	N/A	N/A	N/A
DIST SUBS	5.98	4.95	10.93	52,490	14,872	67,363
(%)	54.69%	45.31%	100.00%	77.92%	22.08%	100.00%
PRIMARY	2.71	24.37	27.08	23,786	58,870	82,656
(%)	10.00%	90.00%	100.00%	28.78%	71.22%	100.00%
SECONDARY	15.57	16.00	31.57	136,802	32,091	168,893
(%)	49.33%	50.67%	100.00%	81.00%	19.00%	100.00%
TOTAL SYS	30.71	92.60	123.31	269,713	299,190	568,903
(%)	24.90%	75.10%	100.00%	47.41%	52.59%	100.00%
TOTAL DIST	24.26	45.32	69.58	213,078	105,833	318,911
(%)	34.86%	65.14%	100.00%	66.81%	33.19%	100.00%

Non-Technical Losses

These are unaccounted for energy losses that are related to energy theft, metering, non-payment by customers, and accounting errors. Losses related to these areas are generally very small and can be extremely difficult and subjective to quantify. Our efforts generally do not develop any meaningful level because we assume that improving technology and utility practices have minimized these amounts.

2.3 Loss Impacts from Distributed Generation (DG)

The impacts of losses on a power system from the installation of various DG facilities will depend somewhat on the penetration level, type of installations and location on a circuit. Based on the results presented in Tables 2, 3, and 4 of this loss study, the loss impacts are significantly different from looking at any single peak load hour versus the potential impacts over all hours of an entire year. Use of a typical uniform loss factor(s) for each voltage level may require additional consideration to recognize that a reduced consumption level could have little or no impact due to the recovery requirements for the high level of fixed losses over the entire hourly electric grid condition for any DG location.

2.4 Description of Model

The loss model is a customized applications model, constructed using the Excel software program. Documentation consists primarily of the model equations at each cell location. A significant advantage of such a model is that the actual formulas and their corresponding computed values at each cell of the model are immediately available to the analyst.

A brief description of the three (3) major categories of effort for the preparation of each loss model is as follows:

- Main tab which contains calculations for all primary and secondary losses, summaries of all conductor and transformer calculations from other tabs discussed below, output reports and supporting results.

- Transformer tab which contains data input and loss calculations for each distribution substation and high voltage transformer. Separate iron and winding losses are calculated for each transformer by identified type.

- Conductor tab containing summary data by major voltage level as to circuit miles, loading assumptions, and kW and kWh loss calculations. Separate loss calculations for each line segment were made using the Company's power flow data by line segment and summarized by voltage level in this model.

3.0 METHODOLOGY

3.1 Background

The objective of a Loss Study is to provide a reasonable set of energy (average) and demand (peak) loss expansion factors which account for system losses associated with the transmission and delivery of power to each voltage level over a designated period of time. The focus of this study is to identify the difference between total energy inputs and the associated sales with the difference being equitably allocated to all delivery levels. Several key elements are important in establishing the methodology for calculating and reporting the Company's losses. These elements are:

- Selection of voltage level of services,
- Recognition of losses associated with conductors, transformations, and other electrical equipment/components within voltage levels,
- Identification of customers and loads at various voltage levels of service,
- Review of generation or net power supply input at each level for the test period studied, and
- Analysis of kW and kWh sales by voltage levels within the test period.

The three major areas of data gathering and calculations in the loss analysis were as follows:

1. System Information (monthly and annual)
    - MWH generation and MWH sales.
    - Coincident peak estimates and net power supply input from all sources and voltage levels.
    - Customer load estimates, adjusted MWH sales, and number of customers in the customer groupings and voltage levels identified in the model.
    - System default values, such as power factor, loading factors, and load factors by voltage level.

2. High Voltage System

   These calculations were prepared separately and their results incorporated through the use of approved FERC loss factors for each generation.

3. Distribution System

   - Distribution Substations – Data was developed for modeling each substation as to its size and loading. Loss calculations were performed from this data to determine load and no load losses separately for each transformer.

   - Primary lines – Line loading and loss characteristics for representative primary circuits were obtained from the Company. These loss results developed kW loss per MW of load and a composite average was calculated to derive the primary loss estimate.

   - Secondary voltage transformers – Losses in line transformers were based on each customer service group's size, as well as the number of customers per transformer. Accounting and load data provided the foundation with which to model the transformer loadings and to calculate load and no load losses.

   - Secondary network – Typical secondary networks were estimated for conductor sizes, lengths, loadings, and customer penetration for residential and small general service customers.

   - Services – Typical services were estimated for each secondary service class of customers identified in the study with respect to type, length, and loading.

The loss analysis was thus performed by constructing the model in segments and subsequently calculating the composite until the constraints of peak demand and energy were met:

- Information as to the physical characteristics and loading of each transformer and conductor segment was modeled.

- Conductors, transformers, and distribution were grouped by voltage level, and unadjusted losses were calculated.

- The loss factors calculated at each voltage level were determined by "compounding" the per-unit losses. Equivalent sales at the supply point

were obtained by dividing sales at a specific level by the compounded loss factor to determine losses by voltage level.

- The resulting demand and energy loss expansion factors were then used to adjust all sales to the generation or input level in order to estimate the difference.

- Reconciliation of kW and kWh sales by voltage level using the reported system kW and kWh was accomplished by adjusting the initial loss factor estimates until the mismatch or difference was eliminated.

3.2 Calculations and Analysis

This section provides a discussion of the input data, assumptions, and calculations performed in the loss analysis. Specific appendices have been included in order to provide documentation of the input data utilized in the model.

3.2.1 Bulk, Transmission and Subtransmission Lines

3.2.2 Transformers

Loss calculations for all high voltage were prepared separately and presented at FERC with the respective approved loss factors incorporated in each of these studies.

3.2.3 Distribution System

The load data at the substation and customer level, coupled with primary and secondary network information, was sufficient to model the distribution system in adequate detail to calculate losses.

Primary Lines

Primary line loadings take into consideration the available distribution load along with the actual customer loads including losses. Primary line loss estimates were prepared by the Company for use in this loss study. These estimates considered voltage levels, loadings, total circuit miles, and wire size. All of these factors were considered in calculating the actual demand (kW) and energy (kWh) for the primary system.

Secondary Voltage Transformers

Losses in line transformers were determined based on typical transformer sizes for each secondary customer service group and an estimated or calculated number

of customers per transformer. Company records and estimates of load data provided the necessary database with which to model the loadings. These calculations also made it possible to determine separate winding and iron losses for distribution line transformers, based on a table of representative losses for various transformer sizes.

Secondary Conductor Circuits

A calculation of secondary conductor circuit losses was performed for loads served through these secondary line investments. Estimates of typical conductor sizes, lengths, loadings and customer class penetrations were made to obtain total circuit miles and losses for the secondary network. Customer loads which do not have secondary line requirements were estimated so that a reasonable estimate of losses and circuit miles of these investments could be made.

Service Drops and Meters

Service drops were estimated for each secondary customer reflecting conductor size, length and loadings to obtain demand losses. A separate calculation was also performed using customer maximum demands to obtain kWh losses. Meter loss estimates were also made for each customer and incorporated into the calculations of kW and kWh losses included in the Summary Results.

4.0 DISCUSSION OF RESULTS

A brief description of each Exhibit provided in Appendix A follows:

Exhibit 1 - Summary of Company Data

This exhibit reflects system information used to determine percent losses and a detailed summary of kW and kWh losses by voltage level. The loss factors developed in Exhibit 7 are also summarized by voltage level.

Exhibit 2 - Summary of Conductor Information

A summary of MW and MWH load and no load losses for conductors by voltage levels is presented. The sum of all calculated losses by voltage level is based on input data information provided in Appendix A. Percent losses are based on equipment loadings.

Exhibit 3 - Summary of Transformer Information

This exhibit summarizes transformer losses by various types and voltage levels throughout the system. Load losses reflect the winding portion of transformer losses while iron losses reflect the no load or constant losses. MWH losses are estimated using a calculated loss factor for winding and the test year hours times no load losses.

Exhibit 4 - Summary of Losses Diagram (2 Pages)

This loss diagram represents the inputs and output of power at system peak conditions. Page 1 details information from all points of the power system and what is provided to the distribution system for primary loads. This portion of the summary can be viewed as a “top down” summary into the distribution system.

Page 2 represents a summary of the development of primary line loads and distribution substations based on a “bottom up” approach. Basically, loadings are developed from the customer meter through the Company’s physical investments based on load research and other metered information by voltage level to arrive at MW and MVA requirements during peak load conditions by voltage levels.

Exhibit 5 - Summary of Sales and Calculated Losses

Summary of Calculated Losses represents a tabular summary of MW and MWH load and no load losses by discrete areas of delivery within each voltage level. Losses have been identified and are derived based on summaries obtained from Exhibits 2 and 3 and losses associated with meters, capacitors and regulators.

Exhibit 6 - Development of Loss Factors, Unadjusted

This exhibit calculates demand and energy losses and loss factors by specific voltage levels based on sales level requirements. The actual results reflect loads by level and summary totals of losses at that level, or up to that level, based on the results as shown in Exhibit 5. Finally, the estimated values at generation are developed and compared to actual generation to obtain any difference or mismatch.

Exhibit 7 - Development of Loss Factors, Adjusted

The adjusted loss factors are the results of adjusting Exhibit 6 for any difference. All differences between estimated and actual are prorated to each level based on the ratio of each level's total load plus losses to the system total. These new loss factors reflect an adjustment in losses due only to the kW and kWh mismatch.

Exhibit 8 – Adjusted Losses and Loss Factors by Facility

These calculations present an expanded summary detail of Exhibit 7 for each segment of the power system with respect to the flow of power and associated losses from the receipt of energy at the meter to the generation for the Evergy power system.

Exhibit 9 – Summary of Losses by Delivery Voltage

These calculations present a reformatted summary of losses presented in Exhibits 7 and 8 by power system delivery segment as calculated by voltage level of service based on reported metered sales.

Exhibit 10 – Composite Summary of Losses for Evergy Metro Only

These calculations are based on using the individual loss results from their respective Exhibit 7 for Metro MO and KS on a load weighted basis by voltage level of service to derive the loss factors.

Appendix A

Results of 2020 Evergy Missouri and Metro Combined

(NOTE: All of the 0.000 high voltage values shown on Exhibits 2, 3, and 5 reflect results that have been included in the loss factor estimates of Exhibit 5, line 22, TOT TRANS LOSS FAC.)

METRO MO

EXHIBIT 1

SUMMARY OF COMPANY DATA

ANNUAL PEAK	1,730	MW
ANNUAL SYSTEM INPUT	8,600,000	MWH
ANNUAL SALES	8,075,854	MWH
SYSTEM LOSSES @ INPUT	524,146	or 6.09%
SYSTEM LOAD FACTOR	56.6%	

SUMMARY OF LOSSES - OUTPUT RESULTS

SERVICE	KV	--- MW ---		% TOTAL	--- MWH ---		% TOTAL
			Input			Input	
TRANS	345,161,115	50.4		40.80%	250,485		47.79%
	69,66,35		2.91%			2.91%	
PRIM SUBS	33,12,1	11.2		9.08%	59,908		11.43%
			0.65%			0.70%	
PRIMARY	33,12,1	32.6		26.37%	87,211		16.64%
			1.88%			1.01%	
SECONDARY	120/240,to,477	29.3		23.76%	126,542		24.14%
			1.70%			1.47%	
TOTAL		123.5		100.00%	524,146		100.00%
			7.14%			6.09%	

SUMMARY OF LOSS FACTORS

SERVICE	KV	CUMMULATIVE SALES EXPANSION FACTORS DEMAND (Peak)		ENERGY (Annual)	
		d	1/d	e	1/e
TOT TRANS	345,161,115	1.03000	0.97087	1.03000	0.97087
	69,66,35				
PRIM SUBS	33,12	1.03709	0.96424	1.03776	0.96361
PRIMARY	33,12,1	1.05865	0.94460	1.04965	0.95270
SECONDARY	120/240,to,477	1.07994	0.92597	1.06899	0.93547

SUMMARY OF CONDUCTOR INFORMATION

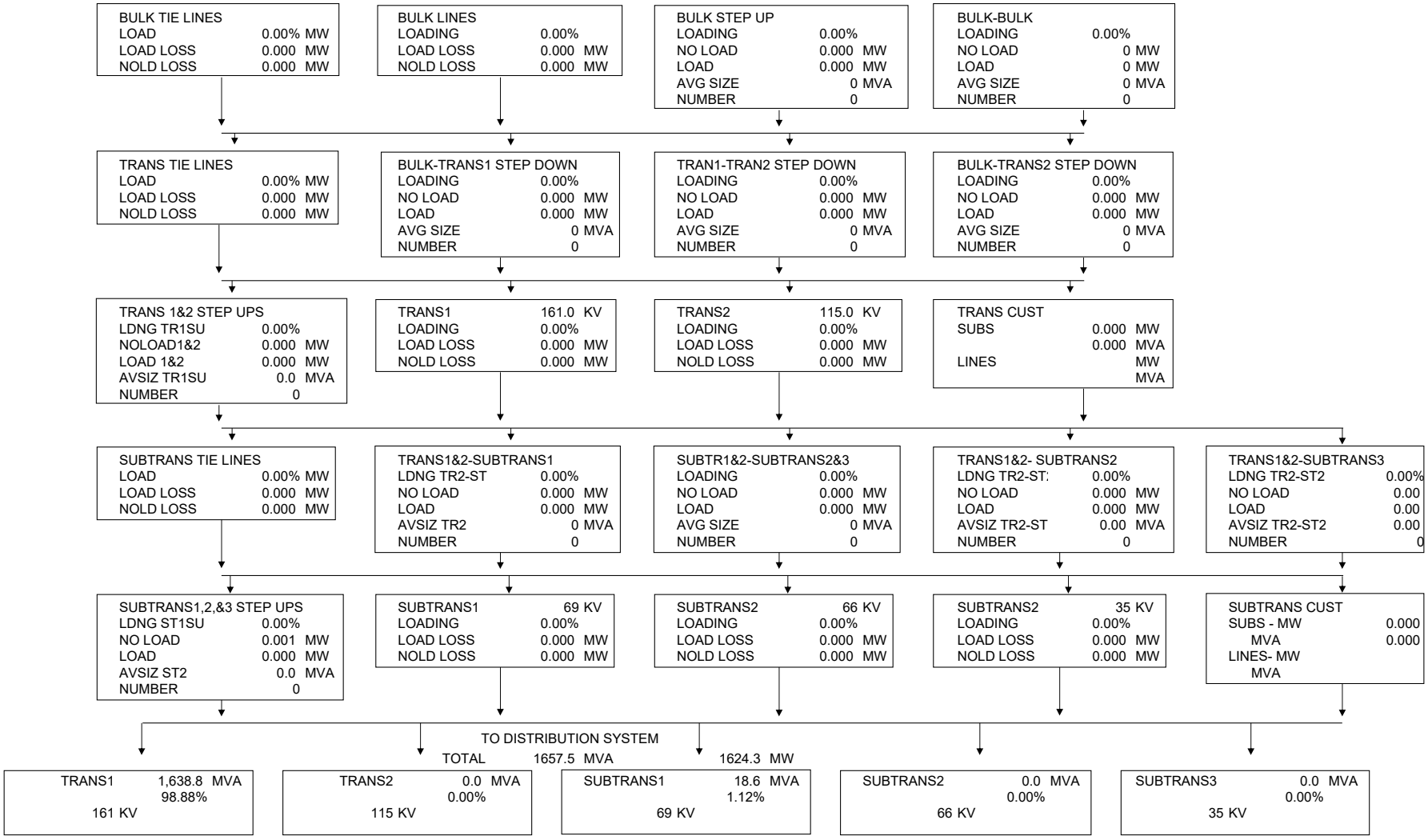
EXHIBIT 2

DESCRIPTION		CIRCUIT MILES	LOADING % RATING	----- MW LOSSES ----- LOAD	NO LOAD	TOTAL	---- MWH LOSSES ---- LOAD	NO LOAD	TOTAL
--- BULK ----------	345 KV OR GREATER ----------								
TIE LINES		0.0	0.00%	0.000	0.000	0.000	0	0	0
BULK TRANS		0.0	0.00%	0.000	0.000	0.000	0	0	0
SUBTOT		0.0		0.000	0.000	0.000	0	0	0
--- TRANS ---------	115 KV TO 345.00 KV								
TIE LINES		0	0.00%	0.000	0.000	0.000	0	0	0
TRANS1	161 KV	0.0	0.00%	0.000	0.000	0.000	0	0	0
TRANS2	115 KV	0.0	0.00%	0.000	0.000	0.000	0	0	0
SUBTOT		0.0		0.000	0.000	0.000	0	0	0
--- SUBTRANS ------	35 KV TO 115 KV								
TIE LINES		0	0.00%	0.000	0.000	0.000	0	0	0
SUBTRANS1	69 KV	0.0	0.00%	0.000	0.000	0.000	0	0	0
SUBTRANS2	66 KV	0.0	0.00%	0.000	0.000	0.000	0	0	0
SUBTRANS3	35 KV	0.0	0.00%	0.000	0.000	0.000	0	2	2
SUBTOT		0.0		0.000	0.000	0.000	0	2	2
PRIMARY LINES		5,601		22.756	2.538	25.293	61,103	22,290	83,393
SECONDARY LINES		3,386		2.413	0.000	2.413	4,184	0	4,184
SERVICES		4,133		2.759	0.618	3.377	6,708	5,431	12,139
TOTAL		13,120		27.927	3.156	31.083	71,995	27,723	99,718

SUMMARY OF TRANSFORMER INFORMATION EXHIBIT 3

DESCRIPTION	KV CAPACITY VOLTAGE	MVA	NUMBER TRANSFMR	AVERAGE SIZE	LOADING %	MVA LOAD	MW LOSSES LOAD	MW LOSSES NO LOAD	MW LOSSES TOTAL	MWH LOSSES LOAD	MWH LOSSES NO LOAD	MWH LOSSES TOTAL
BULK STEP-UP	345	0.0	0	0.0	0.00%	0	0.000	0.000	0.000	0	0	0
BULK - BULK		0.0	0	0.0	0.00%	0	0.000	0.000	0.000	0	0	0
BULK - TRANS1	161	0.0	0	0.0	0.00%	0	0.000	0.000	0.000	0	0	0
BULK - TRANS2	115	0.0	0	0.0	0.00%	0	0.000	0.000	0.000	0	0	0
TRANS1 STEP-UP	161	0.0	0	0.0	0.00%	0	0.000	0.000	0.000	0	0	0
TRANS1 - TRANS2	115	0.0	0	0.0	0.00%	0	0.000	0.000	0.000	0	0	0
TRANS1-SUBTRANS1	69	0.0	0	0.0	0.00%	0	0.000	0.000	0.000	0	0	0
TRANS1-SUBTRANS2	66	0.0	0	0.0	0.00%	0	0.000	0.000	0.000	0	0	0
TRANS1-SUBTRANS3	35	0.0	0	0.0	0.00%	0	0.000	0.000	0.000	0	0	0
TRANS2 STEP-UP	115	0.0	0	0.0	0.00%	0	0.000	0.000	0.000	0	0	0
TRANS2-SUBTRANS1	69	0.0	0	0.0	0.00%	0	0.000	0.000	0.000	0	0	0
TRANS2-SUBTRANS2	66	0.0	0	0.0	0.00%	0	0.000	0.000	0.000	0	0	0
TRANS2-SUBTRANS3	35	0.0	0	0.0	0.00%	0	0.000	0.000	0.000	0	0	0
SUBTRAN1 STEP-UP	69	0.0	0	0.0	0.00%	0	0.000	0.000	0.000	0	0	0
SUBTRAN2 STEP-UP	66	0.0	0	0.0	0.00%	0	0.000	0.001	0.001	0	0	0
SUBTRAN3 STEP-UP	35	0.0	0	0.0	0.00%	0	0.000	0.000	0.000	0	0	0
SUBTRAN1-SUBTRAN2	66	0.0	0	0.0	0.00%	0	0.000	0.000	0.000	0	0	0
SUBTRAN1-SUBTRAN3	35	0.0	0	0.0	0.00%	0	0.000	0.000	0.000	0	0	0
SUBTRAN2-SUBTRAN3	35	0.0	0	0.0	0.00%	0	0.000	0.000	0.000	0	0	0
DISTRIBUTION SUBSTATIONS												
TRANS1 - 161	33	205.6	8	25.7	46.78%	96	0.224	0.289	0.513	763	2,540	3,303
TRANS1 - 161	12	3,684.8	92	40.1	41.87%	1,543	3.304	4.753	8.057	11,372	41,748	53,120
TRANS1 - 161	1	0.0	0	0.0	0.00%	0	0.000	0.000	0.000	0	0	0
TRANS2 - 115	33	0.0	0	0.0	0.00%	0	0.000	0.000	0.000	0	0	0
TRANS2 - 115	12	0.0	0	0.0	0.00%	0	0.000	0.000	0.000	0	0	0
TRANS2 - 115	1	0.0	0	0.0	0.00%	0	0.000	0.000	0.000	0	0	0
SUBTRAN1- 69	33	0.0	0	0.0	0.00%	0	0.000	0.000	0.000	0	0	0
SUBTRAN1- 69	12	42.3	6	7.1	33.39%	14	0.055	0.070	0.126	178	618	796
SUBTRAN1- 69	1	9.3	3	3.1	48.34%	4	0.019	0.020	0.038	60	174	234
SUBTRAN2- 66	33	0.0	0	0.0	0.00%	0	0.000	0.000	0.000	0	0	0
SUBTRAN2- 66	12	0.0	0	0.0	0.00%	0	0.000	0.000	0.000	0	0	0
SUBTRAN2- 66	1	0.0	0	0.0	0.00%	0	0.000	0.000	0.000	0	0	0
SUBTRAN3- 35	33	0.0	0	0.0	0.00%	0	0.000	0.000	0.000	0	0	0
SUBTRAN3- 35	12	0.0	0	0.0	0.00%	0	0.000	0.000	0.000	0	0	0
SUBTRAN3- 35	1	0.0	0	0.0	0.00%	0	0.000	0.000	0.000	0	0	0
PRIMARY - PRIMARY		116.0	21	5.5	29.80%	35	0.082	0.192	0.274	245	1,686	1,931
LINE TRANSFRMR		3,976.5	48,909	81.3	40.88%	1,626	7.065	10.007	17.071	17,136	87,897	105,034
TOTAL		8,034	49,039				10.750	15.332	26.081	29,754	134,663	164,417

SUMMARY OF LOSSES DIAGRAM - DEMAND MODEL - SYSTEM PEAK 1730.25 MW



FROM HIGH VOLTAGE SYSTEM

EXHIBIT 4 PAGE 2 of 2

TOTAL 1,657 MVA 1,624 MW

TRANS1	TRANS2	SUBTRANS1	SUBTRANS2	SUBTRANS3
1,638.8 MVA	0.0 MVA	18.6 MVA	0.0 MVA	0.0 MVA
98.88%	0.00%	1.12%	0.00%	0.00%
161 KV	115 KV	69 KV	66 KV	35 KV

DISTRIBUTION SYSTEM LOAD

	PRIM1	PRIM2	PRIM3	PRIM1	PRIM2	PRIM3	PRIM1	PRIM2	PRIM3	PRIM1	PRIM2	PRIM3	PRIM1	PRIM2	PRIM3	PRIM1	PRIM2	PRIM3
VOLTAGE	33	12	1	33	12	1	33	12	1	33	12	1	33	12	1	33	12	1
LOAD MVA	96	1,543	0	0	0	0	0	14	4	0	0	0	0	0	0	0	0	0
% SYS TOT	5.80%	93.07%	0.00%	0.00%	0.00%	0.00%	0.00%	0.85%	0.27%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
NOLD LOSS	0.289	4.753	0.000	0.000	0.000	0.000	0.000	0.070	0.020	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
LOAD LOSS	0.224	3.304	0.000	0.000	0.000	0.000	0.000	0.055	0.019	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
AVG SIZE	25.7	40.1	0.0	0.0	0.0	0.0	0.0	7.1	3.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NUMBER	8	92	0	0	0	0	0	6	3	0	0	0	0	0	0	0	0	0
DIVERSITY	1.000	1.000	0.000	0.000	0.000	0.000	0.000	1.000	1.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
RATIO																		

PRIMARY LINES

LOADING	1586.159	MW
@ SYS PF	1618.529	MVA
LOAD LOSS	22.756	MW
NOLD LOSS	2.538	MW
TOT LOSS	25.293	MW

PRIM/PRIM TRANSF

LOADING	34.571	MW
NOLD LOSS	0.192	MW
LOAD LOSS	0.082	MW
AVG SIZE	5.52	
NUMBER	21	

PRIM CUST LOADS

NO LINES	0.000	MW
CUST SUB	0.000	MVA
NO LINES	29.000	MW
CO. SUB	29.592	MVA
PRIM WITH	79.250	MW
LINES	86.141	MVA

LINE TRANSFORMERS

LOADING	1481.341	MW MVA	1642.776
NOLD LOSS	10.007	MW	
LOAD LOSS	7.065	MW	
AVG SIZE	81.3	KVA	
NUMBER	48909		

SECONDARY LINES

LOAD	395.887	MW
LOAD LOSS	2.413	MW
NOLD LOSS	0.000	MW
TOT LOSS	2.413	MW

NO SECONDARY LINES

LOAD	1068.383	MW

SERVICES

LOAD	1461.857	MW
LOAD LOSS	2.759	MW
NOLD LOSS	0.618	MW
TOT LOSS	3.377	MW

CUSTOMER SECONDARY LOAD

1458.480 MW

SUMMARY of SALES and CALCULATED LOSSES

EXHIBIT 5

LOSS # AND LEVEL	MW LOAD	NO LOAD	+ LOAD	= TOT LOSS	EXP FACTOR	CUM EXP FAC	MWH LOAD	NO LOAD	+ LOAD	= TOT LOSS	EXP FACTOR	CUM EXP FAC
1 BULK XFMMR	0.0	0.00	0.00	0.00	0.000000	0.000000	0	0	0	0	0	0
2 BULK LINES	0.0	0.00	0.00	0.00	0.000000	0.000000	0	0	0	0	0.0000000	0.0000000
3 TRANS1 XFMR	0.0	0.00	0.00	0.00	0.000000	0.000000	0	0	0	0	0.0000000	0.0000000
4 TRANS1 LINES	0.0	0.00	0.00	0.00	0.000000	0.000000	0	0	0	0	0.0000000	0.0000000
5 TRANS2TR1 SD	0.0	0.00	0.00	0.00	0.000000	0.000000	0	0	0	0	0.0000000	0.0000000
6 TRANS2BLK SD	0.0	0.00	0.00	0.00	0.000000	0.000000	0	0	0	0	0.0000000	0.0000000
7 TRANS2 LINES	0.0	0.00	0.00	0.00	0.000000	0.000000	0	0	0	0	0.0000000	0.0000000
TOTAL TRAN	0.0	0.00	0.00	0.00	0.000000	0.000000	0	0	0	0	0.0000000	0.0000000
8 STR1BLK SD												
9 STR1T1 SD	0.0	0.00	0.00	0.00	0.000000	0.000000	0	0	0	0	0.0000000	0.0000000
10 SRT1T2 SD	0.0	0.00	0.00	0.00	0.000000	0.000000	0	0	0	0	0.0000000	0.0000000
11 SUBTRANS1 LINES	0.0	0.00	0.00	0.00	0.000000	0.000000	0	0	0	0	0.0000000	0.0000000
12 STR2T1 SD	0.0	0.00	0.00	0.00	0.000000	0.000000	0	0	0	0	0.0000000	0.0000000
13 STR2T2 SD	0.0	0.00	0.00	0.00	0.000000	0.000000	0	0	0	0	0.0000000	0.0000000
14 STR2S1 SD	0.0	0.00	0.00	0.00	0.000000	0.000000	0	0	0	0	0.0000000	0.0000000
15 SUBTRANS2 LINES	0.0	0.00	0.00	0.00	0.000000	0.000000	0	0	0	0	0.0000000	0.0000000
16 STR3T1 SD	0.0	0.00	0.00	0.00	0.000000	0.000000	0	0	0	0	0.0000000	0.0000000
17 STR3T2 SD	0.0	0.00	0.00	0.00	0.000000	0.000000	0	0	0	0	0.0000000	0.0000000
18 STR3S1 SD	0.0	0.00	0.00	0.00	0.000000	0.000000	0	0	0	0	0.0000000	0.0000000
19 STR3S2 SD	0.0	0.00	0.00	0.00	0.000000	0.000000	0	0	0	0	0.0000000	0.0000000
20 SUBTRANS3 LINES	0.0	0.00	0.00	0.00	0.000000		0	2	0	2	0.0000000	
21 SUBTRANS TOTAL	0.0	0.00	0.00	0.00	0.000000	**FERC OATT**	0	2	0	2	0.0000000	**FERC OATT**
22 TOT TRANS LOSS FAC	**1,730.3**	**6.05**	**44.35**	**50.40**	**1.030000**	**1.030000**	**8,600,000**	**53,121**	**197,364**	**250,485**	**1.0300000**	**1.0300000**
DISTRIBUTION SUBST												
TRANS1	1,606.1	5.04	3.53	8.57	1.005365	0.000000	7,907,351	44,288	12,135	56,423	1.0071868	0.0000000
TRANS2	0.0	0.00	0.00	0.00	0.000000	0.000000	0	0	0	0	0.0000000	0.0000000
SUBTR1	18.3	0.09	0.07	0.16	1.009061	0.000000	89,863	792	238	1,030	1.0115941	0.0000000
SUBTR2	0.0	0.00	0.00	0.00	0.000000	0.000000	0	0	0	0	0.0000000	0.0000000
SUBTR3	0.0	0.00	0.00	0.00	0.000000	0.000000	0	0	0	0	0.0000000	0.0000000
WEIGHTED AVERAGE	1,624.3	5.13	3.60	8.73	1.005406	1.035568	7,997,214	45,080	12,373	57,453	1.0072361	1.0374532
PRIMARY INTRCHNGE	0.0				0.000000		0				0.0000000	
PRIMARY LINES	1,586.0	2.54	22.84	25.38	1.016260	1.052407	7,693,613	22,290	61,348	83,638	1.0109906	1.0488554
LINE TRANSF	1,481.3	10.01	7.06	17.07	1.011659	1.064677	6,989,913	87,897	17,136	105,034	1.0152557	1.0648564
SECONDARY	1,464.3	0.00	2.41	2.41	1.001650	1.066434	6,884,879	0	4,184	4,184	1.0006081	1.0655039
SERVICES	1,461.9	0.62	2.76	3.38	1.002315	1.068903	6,880,695	5,431	6,708	12,139	1.0017673	1.0673870
TOTAL SYSTEM		24.34	83.02	107.37				213,819	299,114	512,933		

DEVELOPMENT of LOSS FACTORS

EXHIBIT 6

UNADJUSTED
DEMAND

LOSS FACTOR LEVEL	CUSTOMER SALES MW a	CALC LOSS TO LEVEL b	SALES MW @ GEN c	CUM PEAK EXPANSION FACTORS d	1/d
BULK LINES	0.0	0.0	0.0	0.00000	0.00000
TRANS SUBS	0.0	0.0	0.0	0.00000	0.00000
TRANS LINES	0.0	0.0	0.0	0.00000	0.00000
SUBTRANS SUBS	0.0	0.0	0.0	0.00000	0.00000
TOTAL TRANS	40.0	1.2	41.2	1.03000	0.97087
PRIM SUBS	29.0	1.0	30.0	1.03557	0.96565
PRIM LINES	79.3	4.2	83.4	1.05241	0.95020
SECONDARY	1,458.5	100.5	1,559.0	1.06890	0.93554
TOTALS	1,606.7	106.9	1,713.6		

DEVELOPMENT of LOSS FACTORS
UNADJUSTED
ENERGY

LOSS FACTOR LEVEL	CUSTOMER SALES MWH a	CALC LOSS TO LEVEL b	SALES MWH @ GEN c	CUM ANNUAL EXPANSION FACTORS d	1/d
BULK LINES	0	0	0	0.00000	0.00000
TRANS SUBS	0	0	0	0.00000	0.00000
TRANS LINES	0	0	0	0.00000	0.00000
SUBTRANS SUBS	0	0	0	0.00000	0.00000
TOTAL TRANS	340,959	10,229	351,188	1.03000	0.97087
PRIM SUBS	246,276	9,224	255,500	1.03745	0.96390
PRIM LINES	620,063	30,293	650,356	1.04886	0.95342
SECONDARY	6,868,556	462,851	7,331,407	1.06739	0.93687
TOTALS	8,075,854	512,597	8,588,451		

ESTIMATED VALUES AT GENERATION

LOSS FACTOR AT VOLTAGE LEVEL	MW	MWH
BULK LINES	0.00	0
TRANS SUBS	0.00	0
TRANS LINES	0.00	0
SUBTRANS SUBS	0.00	0
SUBTRANS LINES	41.20	351,188
PRIM SUBS	30.03	255,500
PRIM LINES	83.40	650,356
SECONDARY	1,558.97	7,331,407
SUBTOTAL	1,713.61	8,588,451
ACTUAL ENERGY	1,730.25	8,600,000
MISMATCH	(16.64)	(11,549)
% MISMATCH	-0.96%	-0.13%

DEVELOPMENT of LOSS FACTORS EXHIBIT 7

ADJUSTED
DEMAND

LOSS FACTOR LEVEL	CUSTOMER SALES MW a	SALES ADJUST b	CALC LOSS TO LEVEL c	SALES MW @ GEN d	CUM PEAK EXPANSION FACTORS e	f=1/e
BULK LINES	0.0	0.0	0.0	0.0	0.00000	0.00000
TRANS SUBS	0.0	0.0	0.0	0.0	0.00000	0.00000
TRANS LINES	0.0	0.0	0.0	0.0	0.00000	0.00000
SUBTRANS SUBS	0.0	0.0	0.0	0.0	0.00000	0.00000
TOTAL TRANS	40.0	0.0	1.2	41.2	1.03000	0.97087
PRIM SUBS	29.0	0.0	1.1	30.1	1.03709	0.96424
PRIM LINES	79.3	0.0	4.6	83.9	1.05865	0.94460
SECONDARY	1,458.5	0.0	116.6	1,575.1	1.07994	0.92597
			123.5			
TOTALS	1,606.7	0.0	123.5	1,730.3		

DEVELOPMENT of LOSS FACTORS
ADJUSTED
ENERGY

LOSS FACTOR LEVEL	CUSTOMER SALES MWH a	SALES ADJUST b	CALC LOSS TO LEVEL c	SALES MWH @ GEN d	CUM ANNUAL EXPANSION FACTORS e	f=1/e
BULK LINES	0	0	0	0	0.00000	0.00000
TRANS SUBS	0	0	0	0	0.00000	0.00000
TRANS LINES	0	0	0	0	0.00000	0.00000
SUBTRANS SUBS	0	0	0	0	0.00000	0.00000
TOTAL TRANS	340,959	0	10,229	351,188	1.03000	0.97087
PRIM SUBS	246,276	0	9,300	255,576	1.03776	0.96361
PRIM LINES	620,063	0	30,785	650,848	1.04965	0.95270
SECONDARY	6,868,556	0	473,832	7,342,388	1.06899	0.93547
			524,146			
TOTALS	8,075,854	0	524,146	8,600,000		

ESTIMATED VALUES AT GENERATION

LOSS FACTOR AT VOLTAGE LEVEL	MW	MWH
BULK LINES	0.00	0
TRANS SUBS	0.00	0
TRANS LINES	0.00	0
SUBTRANS SUBS	0.00	0
SUBTRANS LINES	41.20	351,188
PRIM SUBS	30.08	255,576
PRIM LINES	83.90	650,848
SECONDARY	1,575.08	7,342,388
	1,730.25	8,600,000
ACTUAL ENERGY	1,730.25	8,600,000
MISMATCH	0.00	0
% MISMATCH	0.00%	0.00%

Adjusted Losses and Loss Factors by Facility EXHIBIT 8

Unadjusted Losses by Segment

	MW	Unadjusted	MWH	Unadjusted
Service Drop Losses	3.38	3.35	12,139	12,123
Secondary Losses	2.41	2.39	4,184	4,179
Line Transformer Losses	17.07	16.93	105,034	104,899
Primary Line Losses	25.38	25.16	83,638	83,531
Distribution Substation Losses	8.73	8.66	57,453	57,379
Transmission System Losses	50.40	50.40	250,485	250,485
Total	107.37	106.88	512,933	512,597

Mismatch Allocation by Segment

	MW	MWH
Service Drop Losses	-0.99	-534
Secondary Losses	-0.70	-184
Line Transformer Losses	-4.99	-4,622
Primary Line Losses	-7.41	-3,680
Distribution Substation Losses	-2.55	-2,528
Transmission System Losses	0.00	0
Total	-16.64	-11,549

Adjusted Losses by Segment

	MW	% of Total	MWH	% of Total
Service Drop Losses	4.33	3.5%	12,657	2.4%
Secondary Losses	3.10	2.5%	4,363	0.8%
Line Transformer Losses	21.91	17.7%	109,521	20.9%
Primary Line Losses	32.57	26.4%	87,211	16.6%
Distribution Substation Losses	11.21	9.1%	59,908	11.4%
Transmission System Losses	50.40	40.8%	250,485	47.8%
Total	123.52	100.0%	524,146	100.0%

Loss Factors by Segment	**MW**	**MWH**	
Retail Sales from Service Drops	1,458.480	6,868,556	
Adjusted Service Drop Losses	4.335	12,657	
Input to Service Drops	1,462.815	6,881,213	
Service Drop Loss Factor	**1.00297**	**1.00184**	
Output from Secondary	1,462.815	6,881,213	
Adjusted Secondary Losses	3.097	4,363	
Input to Secondary	1,465.911	6,885,576	
Secondary Conductor Loss Factor	**1.00212**	**1.00063**	
Output from Line Transformers	1,465.911	6,885,576	
Adjusted Line Transformer Losses	21.912	109,521	
Input to Line Transformers	1,487.823	6,995,098	
Line Transformer Loss Factor	**1.01495**	**1.01591**	
Retail Sales from Primary	74.000	597,779	
Req. Whls Sales from Primary	5.250	22,284	
Input to Line Transformers	1,487.823	6,995,098	
Output from Primary Lines	1,567.073	7,615,161	
Adjusted Primary Line Losses	32.570	87,211	
Input to Primary Lines	1,599.644	7,702,372	
Primary Line Loss Factor	**1.02078**	**1.01145**	
Output PI from Distribution Substations	1,599.644	7,702,372	
Req. Whls Sales from Substations	0.000	0	
Retail Sales from Substations	29.000	246,276	
TotalOutput from Distribution Substations	1,628.644	7,948,648	
Adjusted Distribution Substation Losses	11.211	59,908	
Input to Distribution Substations	1,639.854	8,008,556	
Distribution Substation Loss Factor	**1.00688**	**1.00754**	
Retail Sales at from SubTransmission	40.000	340,959	
Req. Whls Sales from SubTransmission	0.000	0	
Non-Req. Whls Sales from SubTransmission	0.000	0	
Losses	0.000	0	4678
Input to Distribution Substations	1,639.854	8,008,556	
Output from SubTransmission	1,679.854	8,349,515	1,730.250
SubTransmission System Losses	50.396	250,485	50.396
Input to Transmission	1,730.250	8,600,000	50.396
TotTransmission System Loss Factor	**1.03000**	**1.03000**	50.396

DEMAND MW **SUMMARY OF LOSSES AND LOSS FACTORS BY DELIVERY VOLTAGE** **EXHIBIT 9**

	SERVICE LEVEL		SALES MW	LOSSES	SECONDARY	PRIMARY	SUBSTATION	SUBTRANS	TRANSMISSION
1	**SERVICES**								
2	SALES		1,458.5		1,458.5				
3	LOSSES			4.3	4.3				
4	INPUT				1,462.8				
5	**EXPANSION FACTOR**	**1.00297**							
6	**SECONDARY**								
7	SALES								
8	LOSSES			3.1	3.1				
9	INPUT				1,465.9				
10	**EXPANSION FACTOR**	**1.00212**							
11	**LINE TRANSFORMER**								
12	SALES								
13	LOSSES			21.9	21.9				
14	INPUT				1,487.8				
15	**EXPANSION FACTOR**	**1.01495**							
16	**PRIMARY**								
17	SECONDARY				1,487.8				
18	SALES		74.0			74.0			
19	LOSSES			32.6	30.9	1.5			
20	INPUT				1,518.7	75.5			
21	**EXPANSION FACTOR**	**1.02078**							
22	**SUBSTATION**								
23	PRIMARY				1,518.7	75.5			
24	SALES		29.0				29.0		
25	LOSSES			11.2	10.5	0.5	0.2		
26	INPUT				1,529.2	76.1	29.2		
27	**EXPANSION FACTOR**	**1.00688**							
28	**SUB-TRANSMISSION**								
29	DISTRIBUTION SUBS								
30	SALES								
31	LOSSES								
32	INPUT								
33	**EXPANSION FACTOR**								
34	**TRANSMISSION**								
35	SUBTRANSMISSION								
36	DISTRIBUTION SUBS				1,529.2	76.1	29.2		
37	SALES		40.0						40.0
38	LOSSES			50.2	45.9	2.3	0.9		1.2
39	INPUT				1,575.1	78.3	30.1		41.2
40	**EXPANSION FACTOR**	**1.03000**							
41	**TOTALS** LOSSES			123.4	116.6	4.3	1.1		1.2
42	% OF TOTAL			100%	94.52%	3.52%	0.87%		0.97%
43	SALES		1,601.5		1,458.5	74.0	29.0		40.0
44	% OF TOTAL		100.00%		91.07%	4.62%	1.81%		2.50%
45	INPUT		1,724.7		1,575.1	78.3	30.1		41.2
46	**CUMMULATIVE EXPANSION LOSS FACTORS** (from meter to system input)				**1.07994**	**1.05865**	**1.03709**		**1.03000**

ENERGY MWH **SUMMARY OF LOSSES AND LOSS FACTORS BY DELIVERY VOLTAGE** **EXHIBIT 9**

	SERVICE LEVEL		SALES	LOSSES	SECONDARY	PRIMARY	SUBSTATION	SUBTRANS	TRANSMISSION
1	**SERVICES**								
2	SALES		6,868,556		6,868,556				
3	LOSSES			12,657	12,657				
4	INPUT				6,881,213				
5	**EXPANSION FACTOR**	**1.00184**							
6	**SECONDARY**								
7	SALES								
8	LOSSES			4,363	4,363				
9	INPUT				6,885,576				
10	**EXPANSION FACTOR**	**1.00063**							
11	**LINE TRANSFORMER**								
12	SALES								
13	LOSSES			109,521	109,521				
14	INPUT				6,995,098				
15	**EXPANSION FACTOR**	**1.01591**							
16	**PRIMARY**								
17	SECONDARY				6,995,098				
18	SALES		597,779.000			597,779			
19	LOSSES			87,211	80,110	6,846			
20	INPUT				7,075,208	604,625			
21	**EXPANSION FACTOR**	**1.01145**							
22	**SUBSTATION**								
23	PRIMARY				7,075,208	604,625			
24	SALES		246,276				246,276		
25	LOSSES			59,908	53,325	4,557	1,856		
26	INPUT				7,128,532	609,182	248,132		
27	**EXPANSION FACTOR**	**1.00754**							
28	**SUB-TRANSMISSION**								
29	DISTRIBUTION SUBS								
30	SALES								
31	LOSSES								
32	INPUT								
33	**EXPANSION FACTOR**								
34	**TRANSMISSION**								
35	SUBTRANSMISSION								
36	DISTRIBUTION SUBS				7,128,532	609,182	248,132		
37	SALES		340,959						340,959
38	LOSSES			249,804	213,856	18,275	7,444		10,229
39	INPUT				7,342,388	627,457	255,576		351,188
40	**EXPANSION FACTOR**	**1.03000**							
41	**TOTALS** LOSSES			523,465	473,832	29,678	9,300		10,229
42	% OF TOTAL			100%	90.52%	5.67%	1.78%		1.95%
43	SALES		8,053,570		6,868,556	597,779	246,276		340,959
44	% OF TOTAL		100.00%		85.29%	7.42%	3.06%		4.23%
45	INPUT		8,576,610		7,342,388	627,457	255,576		351,188
46	**CUMMULATIVE EXPANSION LOSS FACTORS** (from meter to system input)				**1.06899**	**1.04965**	**1.03776**		**1.03000**

KCPL KS & MO **DEVELOPMENT of LOSS FACTORS** **EXHIBIT 10**
COMPOSITE **ADJUSTED** **EXHIBIT 7** PAGE 1 OF 2
LOSS FACTORS **DEMAND**

LOSS FACTOR LEVEL	CUSTOMER SALES MW	SALES ADJUST	CALC LOSS TO LEVEL	SALES MW @ GEN	CUM PEAK FACTORS	EXPANTION	
	a	b	c	d	e	f=1/e	
BULK LINES	0.0	0.0	0.0	0.0	0.00000	0.00000	
TRANS SUBS	0.0	0.0	0.0	0.0	0.00000	0.00000	
TRANS LINES	0.0	0.0	0.0	0.0	0.00000	0.00000	
TOTAL TRANS	0.0	0.0	0.0	0.0	0.00000	0.97824	
SUBTRANS	40.0	0.0	1.2	41.2	1.03000	0.97824	
PRIM SUBS	33.0	0.0	1.2	34.2	1.03694	0.96437	
PRIM LINES	147.3	0.0	8.5	155.8	1.05786	0.94061	
SECONDARY	2,851.0	0.0	223.0	3,074.1	1.07822	0.91849	
TOTALS	3,071.3	0.0	234.0	3,305.3	1.07618	<COMPOSITE	

DEVELOPMENT of LOSS FACTORS
ADJUSTED
ENERGY

LOSS FACTOR LEVEL	CUSTOMER SALES MWH	SALES **ADJUST**	CALC LOSS TO LEVEL	SALES MWH @ GEN	CUM ANNUAL FACTORS	EXPANTION	
	a	b	c	d	e	f=1/e	
BULK LINES	0	0	0	0	0.00000	0.00000	
TRANS SUBS	0	0	0	0	0.00000	0.00000	
TRANS LINES	0	0	0	0	0.00000	0.00000	
TOTAL TRANS	0	0	0	0	0.00000	0.00000	
SUBTRANS	340959	0	10229	351188	1.03000	0.97087	
PRIM SUBS	269,877	0	10,188	280,065	1.03775	0.96362	
PRIM LINES	1,017,249	0	50,676	1,067,925	1.04982	0.95255	
SECONDARY	12,617,891	0	882,932	13,500,823	1.06997	0.93460	
TOTAL	14,245,976	0	954,024	15,200,000	1.06697	<COMPOSITE	

KCPL Kansas

DEVELOPMENT of LOSS FACTORS
ADJUSTED DEMAND **EXHIBIT 7**

EXHIBIT 10
PAGE 2 OF 2

LOSS FACTOR LEVEL	CUSTOMER SALES MW a	SALES ADJUST b	CALC LOSS TO LEVEL c	SALES MW @ GEN d	CUM PEAK FACTORS e	EXPANTION f=1/e	
BULK LINES	0.0	0	0	0.0	0.00000	0.00000	
TRANS SUBS	0.0	0	0	0.0	0.00000	0.00000	
TRANS LINES	0.0	0	0	0.0	0.00000	0.00000	
TOTAL TRANS	0.0	0.0	0.0	0.0	0.00000	0.91849	
SUBTRANS	0.0	0.0	0.0	0.0	0.00000	0.91849	
PRIM SUBS	4.0	0.0	0.1	4.1	1.03587	0.91849	
PRIM LINES	68.0	0.0	3.9	71.9	1.05695	0.91849	
SECONDARY	1,392.6	0.0	106.4	1,499.0	1.07642	0.91849	
TOTALS	1,464.6	0.0	110.4	1,575.0	1.07541	<COMPOSITE	

DEVELOPMENT of LOSS FACTORS
ADJUSTED ENERGY

LOSS FACTOR LEVEL	CUSTOMER SALES MWH a	SALES **ADJUST** b	CALC LOSS TO LEVEL c	SALES MWH @ GEN d	CUM ANNUAL FACTORS e	EXPANTION f=1/e	
BULK LINES	0	0	0	0	0.00000	0.00000	
TRANS SUBS	0	0	0	0	0.00000	0.00000	
TRANS LINES	0	0	0	0	0.00000	0.00000	
TOTAL TRANS	0	0	0	0	0.00000	0.00000	
SUBTRANS	0	0	0	0	0.00000	0.00000	
PRIM SUBS	23,601	0	888	24,489	1.03762	0.96374	
PRIM LINES	397,186	0	19,891	417,077	1.05008	0.95231	
SECONDARY	5,749,335	0	409,099	6,158,434	1.07116	0.93357	
TOTAL	6,170,122	0	429,878	6,600,000	1.06967	<COMPOSITE	

KCPL Missouri

DEVELOPMENT of LOSS FACTORS
ADJUSTED DEMAND **EXHIBIT 7**

LOSS FACTOR LEVEL	CUSTOMER SALES MW a	SALES ADJUST b	CALC LOSS TO LEVEL c	SALES MW @ GEN d	CUM PEAK FACTORS e	EXPANTION f=1/e	
BULK LINES	0.0	0	0	0.0	0.00000	0.00000	
TRANS SUBS	0.0	0	0	0.0	0.00000	0.00000	
TRANS LINES	0.0	0	0	0.0	0.00000	0.00000	
TOTAL TRANS	0.0	0.0	0.0	0.0	0.00000	0.00000	
SUBTRANS	40.0	0.0	1.2	41.2	1.03000	0.97087	
PRIM SUBS	29.0	0.0	1.1	30.1	1.03709	0.96424	
PRIM LINES	79.3	0.0	4.6	83.9	1.05865	0.94460	
SECONDARY	1458.5	0.0	116.6	1575.1	1.07994	0.92597	
TOTALS	1,606.7	0.0	123.5	1,730.3	1.07688	<COMPOSITE	

DEVELOPMENT of LOSS FACTORS
ADJUSTED ENERGY

LOSS FACTOR LEVEL	CUSTOMER SALES MWH a	SALES **ADJUST** b	CALC LOSS TO LEVEL c	SALES MWH @ GEN d	CUM ANNUAL FACTORS e	EXPANTION f=1/e	
BULK LINES	0	0	0	0	0.00000	0.00000	
TRANS SUBS	0	0	0	0	0.00000	0.00000	
TRANS LINES	0	0	0	0	0.00000	0.00000	
TOTAL TRANS	0	0	0	0	0.00000	0.00000	
SUBTRANS	340,959	0	10,229	351,188	1.03000	0.97087	
PRIM SUBS	246,276	0	9,300	255,576	1.03776	0.96361	
PRIM LINES	620,063	0	30,785	650,848	1.04965	0.95270	
SECONDARY	6,868,556	0	473,832	7,342,388	1.06899	0.93547	
TOTAL	8,075,854	0	524,146	8,600,000	1.06490	<COMPOSITE	

Appendix B

Results of 2020 Evergy Kansas and Metro Combined

(NOTE: All of the 0.000 high voltage values shown on Exhibits 2, 3, and 5 reflect results that have been included in the loss factor estimates of Exhibit 5, line 22, TOT TRANS LOSS FAC.)

METRO KS

EXHIBIT 1

SUMMARY OF COMPANY DATA

ANNUAL PEAK	1,575	MW
ANNUAL SYSTEM INPUT	6,600,000	MWH
ANNUAL SALES	6,170,122	MWH
SYSTEM LOSSES @ INPUT	429,878	or 6.51%
SYSTEM LOAD FACTOR	47.7%	

SUMMARY OF LOSSES - OUTPUT RESULTS

SERVICE	KV	--- MW --- Input	% TOTAL	--- MWH --- Input	% TOTAL
TRANS	345,161,115	45.9	41.54%	192,233	44.72%
	69,66,35	2.91%		2.91%	
PRIM SUBS	33,12,1	8.7	7.85%	47,082	10.95%
		0.55%		0.71%	
PRIMARY	33,12,1	30.2	27.38%	75,165	17.49%
		1.92%		1.14%	
SECONDARY	120/240,to,477	25.7	23.23%	115,398	26.84%
		1.63%		1.75%	
TOTAL		110.4	100.00%	429,878	100.00%
		7.01%		6.51%	

SUMMARY OF LOSS FACTORS

SERVICE	KV	CUMMULATIVE SALES EXPANSION FACTORS DEMAND (Peak) d	1/d	ENERGY (Annual) e	1/e
TOT TRANS	345,161,115 69,66,35	1.03000	0.97087	1.03000	0.97087
PRIM SUBS	33,12	1.03587	0.96537	1.03762	0.96374
PRIMARY	33,12,1	1.05695	0.94612	1.05008	0.95231
SECONDARY	120/240,to,477	1.07642	0.92900	1.07116	0.93357

SUMMARY OF CONDUCTOR INFORMATION

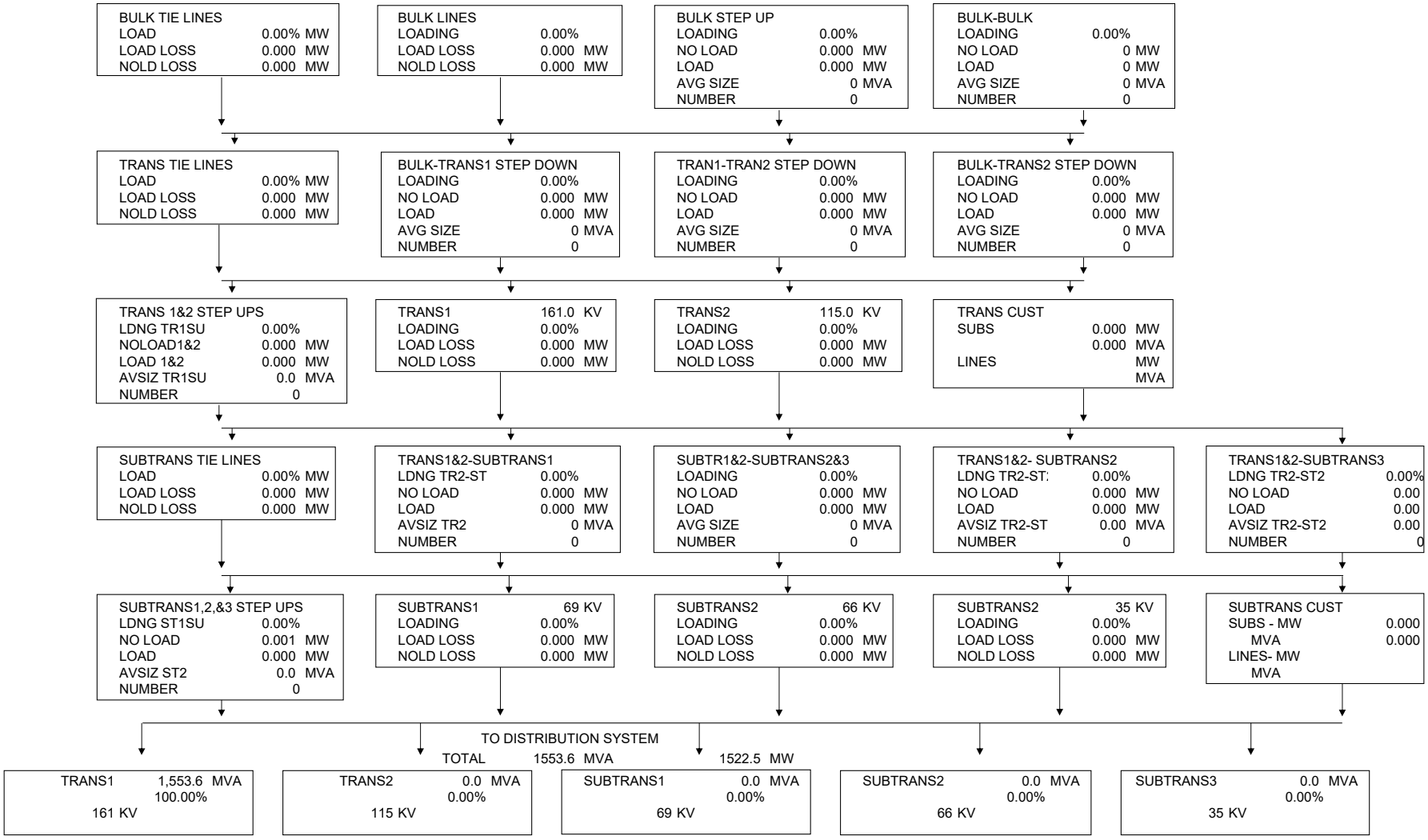
EXHIBIT 2

DESCRIPTION		CIRCUIT MILES	LOADING % RATING	----- MW LOSSES ----- LOAD	NO LOAD	TOTAL	---- MWH LOSSES ---- LOAD	NO LOAD	TOTAL
--- BULK ----------	345 KV OR GREATER ----------								
TIE LINES		0.0	0.00%	0.000	0.000	0.000	0	0	0
BULK TRANS		0.0	0.00%	0.000	0.000	0.000	0	0	0
SUBTOT		0.0		0.000	0.000	0.000	0	0	0
--- TRANS ---------	115 KV TO 345.00 KV								
TIE LINES		0	0.00%	0.000	0.000	0.000	0	0	0
TRANS1	161 KV	0.0	0.00%	0.000	0.000	0.000	0	0	0
TRANS2	115 KV	0.0	0.00%	0.000	0.000	0.000	0	0	0
SUBTOT		0.0		0.000	0.000	0.000	0	0	0
--- SUBTRANS ------	35 KV TO 115 KV								
TIE LINES		0	0.00%	0.000	0.000	0.000	0	0	0
SUBTRANS1	69 KV	0.0	0.00%	0.000	0.000	0.000	0	0	0
SUBTRANS2	66 KV	0.0	0.00%	0.000	0.000	0.000	0	0	0
SUBTRANS3	35 KV	0.0	0.00%	0.000	0.000	0.000	0	0	0
SUBTOT		0.0		0.000	0.000	0.000	0	0	0
PRIMARY LINES		6,899		24.151	2.720	26.870	50,107	23,888	73,995
SECONDARY LINES		2,331		2.604	0.000	2.604	4,065	0	4,065
SERVICES		3,705		3.228	0.553	3.780	5,866	4,856	10,723
TOTAL		12,935		29.983	3.272	33.255	60,039	28,745	88,783

SUMMARY OF TRANSFORMER INFORMATION EXHIBIT 3

DESCRIPTION	KV CAPACITY VOLTAGE	MVA	NUMBER TRANSFMR	AVERAGE SIZE	LOADING %	MVA LOAD	MW LOSSES LOAD	MW LOSSES NO LOAD	MW LOSSES TOTAL	MWH LOSSES LOAD	MWH LOSSES NO LOAD	MWH LOSSES TOTAL
BULK STEP-UP	345	0.0	0	0.0	0.00%	0	0.000	0.000	0.000	0	0	0
BULK - BULK		0.0	0	0.0	0.00%	0	0.000	0.000	0.000	0	0	0
BULK - TRANS1	161	0.0	0	0.0	0.00%	0	0.000	0.000	0.000	0	0	0
BULK - TRANS2	115	0.0	0	0.0	0.00%	0	0.000	0.000	0.000	0	0	0
TRANS1 STEP-UP	161	0.0	0	0.0	0.00%	0	0.000	0.000	0.000	0	0	0
TRANS1 - TRANS2	115	0.0	0	0.0	0.00%	0	0.000	0.000	0.000	0	0	0
TRANS1-SUBTRANS1	69	0.0	0	0.0	0.00%	0	0.000	0.000	0.000	0	0	0
TRANS1-SUBTRANS2	66	0.0	0	0.0	0.00%	0	0.000	0.000	0.000	0	0	0
TRANS1-SUBTRANS3	35	0.0	0	0.0	0.00%	0	0.000	0.000	0.000	0	0	0
TRANS2 STEP-UP	115	0.0	0	0.0	0.00%	0	0.000	0.000	0.000	0	0	0
TRANS2-SUBTRANS1	69	0.0	0	0.0	0.00%	0	0.000	0.000	0.000	0	0	0
TRANS2-SUBTRANS2	66	0.0	0	0.0	0.00%	0	0.000	0.000	0.000	0	0	0
TRANS2-SUBTRANS3	35	0.0	0	0.0	0.00%	0	0.000	0.000	0.000	0	0	0
SUBTRAN1 STEP-UP	69	0.0	0	0.0	0.00%	0	0.000	0.000	0.000	0	0	0
SUBTRAN2 STEP-UP	66	0.0	0	0.0	0.00%	0	0.000	0.001	0.001	0	0	0
SUBTRAN3 STEP-UP	35	0.0	0	0.0	0.00%	0	0.000	0.000	0.000	0	0	0
SUBTRAN1-SUBTRAN2	66	0.0	0	0.0	0.00%	0	0.000	0.000	0.000	0	0	0
SUBTRAN1-SUBTRAN3	35	0.0	0	0.0	0.00%	0	0.000	0.000	0.000	0	0	0
SUBTRAN2-SUBTRAN3	35	0.0	0	0.0	0.00%	0	0.000	0.000	0.000	0	0	0
DISTRIBUTION SUBSTATIONS												
TRANS1 - 161	33	287.2	10	28.7	42.85%	123	0.268	0.392	0.660	719	3,442	4,161
TRANS1 - 161	12	2,833.2	78	36.3	50.49%	1,431	3.278	3.862	7.139	8,724	33,920	42,644
TRANS1 - 161	1	0.0	0	0.0	0.00%	0	0.000	0.000	0.000	0	0	0
TRANS2 - 115	33	0.0	0	0.0	0.00%	0	0.000	0.000	0.000	0	0	0
TRANS2 - 115	12	0.0	0	0.0	0.00%	0	0.000	0.000	0.000	0	0	0
TRANS2 - 115	1	0.0	0	0.0	0.00%	0	0.000	0.000	0.000	0	0	0
SUBTRAN1- 69	33	0.0	0	0.0	0.00%	0	0.000	0.000	0.000	0	0	0
SUBTRAN1- 69	12	0.0	0	0.0	0.00%	0	0.000	0.000	0.000	0	0	0
SUBTRAN1- 69	1	0.0	0	0.0	0.00%	0	0.000	0.000	0.000	0	0	0
SUBTRAN2- 66	33	0.0	0	0.0	0.00%	0	0.000	0.000	0.000	0	0	0
SUBTRAN2- 66	12	0.0	0	0.0	0.00%	0	0.000	0.000	0.000	0	0	0
SUBTRAN2- 66	1	0.0	0	0.0	0.00%	0	0.000	0.000	0.000	0	0	0
SUBTRAN3- 35	33	0.0	0	0.0	0.00%	0	0.000	0.000	0.000	0	0	0
SUBTRAN3- 35	12	0.0	0	0.0	0.00%	0	0.000	0.000	0.000	0	0	0
SUBTRAN3- 35	1	0.0	0	0.0	0.00%	0	0.000	0.000	0.000	0	0	0
PRIMARY - PRIMARY		200.0	42	4.8	43.23%	86	0.325	0.340	0.665	726	2,985	3,711
LINE TRANSFRMR		3,919.4	58,416	67.1	39.63%	1,553	6.800	9.895	16.695	13,015	86,913	99,928
TOTAL		7,240	58,546				10.671	14.489	25.160	23,183	127,260	150,443

SUMMARY OF LOSSES DIAGRAM - DEMAND MODEL - SYSTEM PEAK 1575 MW



FROM HIGH VOLTAGE SYSTEM

TOTAL 1,554 MVA 1,522 MW

TRANS1	TRANS2	SUBTRANS1	SUBTRANS2	SUBTRANS3
1,553.6 MVA	0.0 MVA	0.0 MVA	0.0 MVA	0.0 MVA
100.00%	0.00%	0.00%	0.00%	0.00%
161 KV	115 KV	69 KV	66 KV	35 KV

DISTRIBUTION SYSTEM LOAD

	PRIM1	PRIM2	PRIM3	PRIM1	PRIM2	PRIM3	PRIM1	PRIM2	PRIM3	PRIM1	PRIM2	PRIM3	PRIM1	PRIM2	PRIM3	PRIM1	PRIM2	PRIM3
VOLTAGE	33	12	1	33	12	1	33	12	1	33	12	1	33	12	1	33	12	1
LOAD MVA	123	1,431	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% SYS TOT	7.92%	92.08%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
NOLD LOSS	0.392	3.862	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
LOAD LOSS	0.268	3.278	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
AVG SIZE	28.7	36.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NUMBER	10	78	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DIVERSITY	1.000	1.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
RATIO																		

PRIMARY LINES

LOADING	1511.175	MW
@ SYS PF	1542.015	MVA
LOAD LOSS	24.151	MW
NOLD LOSS	2.720	MW
TOT LOSS	26.870	MW

PRIM/PRIM TRANSF

LOADING	86.445	MW
NOLD LOSS	0.340	MW
LOAD LOSS	0.325	MW
AVG SIZE	4.76	
NUMBER	42	

PRIM CUST LOADS

NO LINES	0.000	MW
CUST SUB	0.000	MVA
NO LINES	4.000	MW
CO. SUB	4.082	MVA
PRIM WITH	68.000	MW
LINES	73.913	MVA

LINE TRANSFORMERS

LOADING	1415.640	MW	MVA	1569.816
NOLD LOSS	9.895	MW		
LOAD LOSS	6.800	MW		
AVG SIZE	67.1	KVA		
NUMBER	58416			

SECONDARY LINES

LOAD	339.935	MW
LOAD LOSS	2.604	MW
NOLD LOSS	0.000	MW
TOT LOSS	2.604	MW

NO SECONDARY LINES

LOAD	1059.010	MW

SERVICES

LOAD	1396.340	MW
LOAD LOSS	3.228	MW
NOLD LOSS	0.553	MW
TOT LOSS	3.780	MW

CUSTOMER SECONDARY LOAD

1392.560 MW

SUMMARY of SALES and CALCULATED LOSSES

EXHIBIT 5

LOSS # AND LEVEL	MW LOAD	NO LOAD	+ LOAD	= TOT LOSS	EXP FACTOR	CUM EXP FAC	MWH LOAD	NO LOAD	+ LOAD	= TOT LOSS	EXP FACTOR	CUM EXP FAC
1 BULK XFMMR	0.0	0.00	0.00	0.00	0.000000	0.000000	0	0	0	0	0	0
2 BULK LINES	0.0	0.00	0.00	0.00	0.000000	0.000000	0	0	0	0	0.0000000	0.0000000
3 TRANS1 XFMR	0.0	0.00	0.00	0.00	0.000000	0.000000	0	0	0	0	0.0000000	0.0000000
4 TRANS1 LINES	0.0	0.00	0.00	0.00	0.000000	0.000000	0	0	0	0	0.0000000	0.0000000
5 TRANS2TR1 SD	0.0	0.00	0.00	0.00	0.000000	0.000000	0	0	0	0	0.0000000	0.0000000
6 TRANS2BLK SD	0.0	0.00	0.00	0.00	0.000000	0.000000	0	0	0	0	0.0000000	0.0000000
7 TRANS2 LINES	0.0	0.00	0.00	0.00	0.000000	0.000000	0	0	0	0	0.0000000	0.0000000
TOTAL TRAN	0.0	0.00	0.00	0.00	0.000000	0.000000	0	0	0	0	0.0000000	0.0000000
8 STR1BLK SD												
9 STR1T1 SD	0.0	0.00	0.00	0.00	0.000000	0.000000	0	0	0	0	0.0000000	0.0000000
10 SRT1T2 SD	0.0	0.00	0.00	0.00	0.000000	0.000000	0	0	0	0	0.0000000	0.0000000
11 SUBTRANS1 LINES	0.0	0.00	0.00	0.00	0.000000	0.000000	0	0	0	0	0.0000000	0.0000000
12 STR2T1 SD	0.0	0.00	0.00	0.00	0.000000	0.000000	0	0	0	0	0.0000000	0.0000000
13 STR2T2 SD	0.0	0.00	0.00	0.00	0.000000	0.000000	0	0	0	0	0.0000000	0.0000000
14 STR2S1 SD	0.0	0.00	0.00	0.00	0.000000	0.000000	0	0	0	0	0.0000000	0.0000000
15 SUBTRANS2 LINES	0.0	0.00	0.00	0.00	0.000000	0.000000	0	0	0	0	0.0000000	0.0000000
16 STR3T1 SD	0.0	0.00	0.00	0.00	0.000000	0.000000	0	0	0	0	0.0000000	0.0000000
17 STR3T2 SD	0.0	0.00	0.00	0.00	0.000000	0.000000	0	0	0	0	0.0000000	0.0000000
18 STR3S1 SD	0.0	0.00	0.00	0.00	0.000000	0.000000	0	0	0	0	0.0000000	0.0000000
19 STR3S2 SD	0.0	0.00	0.00	0.00	0.000000	0.000000	0	0	0	0	0.0000000	0.0000000
20 SUBTRANS3 LINES	0.0	0.00	0.00	0.00	0.000000		0	0	0	0	0.0000000	
21 SUBTRANS TOTAL	0.0	0.00	0.00	0.00	0.000000	**FERC OATT**	0	0	0	0	0.0000000	**FERC OATT**
22 TOT TRANS LOSS FAC	**1,575.0**	**5.50**	**40.37**	**45.87**	**1.030000**	**1.030000**	**6,600,000**	**48,355**	**143,878**	**192,233**	**1.0300000**	**1.0300000**
DISTRIBUTION SUBST												
TRANS1	1,522.5	4.25	3.55	7.80	1.005149	0.000000	6,405,928	37,362	9,442	46,804	1.0073602	0.0000000
TRANS2	0.0	0.00	0.00	0.00	0.000000	0.000000	0	0	0	0	0.0000000	0.0000000
SUBTR1	0.0	0.00	0.00	0.00	0.000000	0.000000	0	0	0	0	0.0000000	0.0000000
SUBTR2	0.0	0.00	0.00	0.00	0.000000	0.000000	0	0	0	0	0.0000000	0.0000000
SUBTR3	0.0	0.00	0.00	0.00	0.000000	0.000000	0	0	0	0	0.0000000	0.0000000
WEIGHTED AVERAGE	1,522.5	4.25	3.55	7.80	1.005149	1.035303	6,405,928	37,362	9,442	46,804	1.0073602	1.0375810
PRIMARY INTRCHNGE	0.0				0.000000		0				0.0000000	
PRIMARY LINES	1,510.8	2.72	24.48	27.20	1.018330	1.054280	6,335,958	23,888	50,833	74,721	1.0119339	1.0499634
LINE TRANSF	1,415.6	9.89	6.80	16.69	1.011934	1.066862	5,864,051	86,913	13,015	99,928	1.0173363	1.0681658
SECONDARY	1,398.9	0.00	2.60	2.60	1.001865	1.068852	5,764,123	0	4,065	4,065	1.0007057	1.0689197
SERVICES	1,396.3	0.55	3.23	3.78	1.002715	1.071754	5,760,058	4,856	5,866	10,723	1.0018651	1.0709133
TOTAL SYSTEM		22.93	81.02	103.95				201,374	227,100	428,475		

DEVELOPMENT of LOSS FACTORS EXHIBIT 6

UNADJUSTED
DEMAND

LOSS FACTOR LEVEL	CUSTOMER SALES MW a	CALC LOSS TO LEVEL b	SALES MW @ GEN c	CUM PEAK EXPANSION FACTORS d	1/d
BULK LINES	0.0	0.0	0.0	0.00000	0.00000
TRANS SUBS	0.0	0.0	0.0	0.00000	0.00000
TRANS LINES	0.0	0.0	0.0	0.00000	0.00000
SUBTRANS SUBS	0.0	0.0	0.0	0.00000	0.00000
TOTAL TRANS	0.0	0.0	0.0	1.03000	0.97087
PRIM SUBS	4.0	0.1	4.1	1.03530	0.96590
PRIM LINES	68.0	3.7	71.7	1.05428	0.94851
SECONDARY	1,392.6	99.9	1,492.5	1.07175	0.93305
TOTALS	1,464.6	103.8	1,568.3		

DEVELOPMENT of LOSS FACTORS
UNADJUSTED
ENERGY

LOSS FACTOR LEVEL	CUSTOMER SALES MWH a	CALC LOSS TO LEVEL b	SALES MWH @ GEN c	CUM ANNUAL EXPANSION FACTORS d	1/d
BULK LINES	0	0	0	0.00000	0.00000
TRANS SUBS	0	0	0	0.00000	0.00000
TRANS LINES	0	0	0	0.00000	0.00000
SUBTRANS SUBS	0	0	0	0.00000	0.00000
TOTAL TRANS	0	0	0	1.03000	0.97087
PRIM SUBS	23,601	887	24,488	1.03758	0.96378
PRIM LINES	397,186	19,845	417,031	1.04996	0.95241
SECONDARY	5,749,335	407,704	6,157,039	1.07091	0.93378
TOTALS	6,170,122	428,436	6,598,558		

ESTIMATED VALUES AT GENERATION

LOSS FACTOR AT VOLTAGE LEVEL	MW	MWH
BULK LINES	0.00	0
TRANS SUBS	0.00	0
TRANS LINES	0.00	0
SUBTRANS SUBS	0.00	0
SUBTRANS LINES	0.00	0
PRIM SUBS	4.14	24,488
PRIM LINES	71.69	417,031
SECONDARY	1,492.48	6,157,039
SUBTOTAL	1,568.31	6,598,558
ACTUAL ENERGY	1,575.00	6,600,000
MISMATCH	(6.69)	(1,442)
% MISMATCH	-0.42%	-0.02%

DEVELOPMENT of LOSS FACTORS EXHIBIT 7

ADJUSTED
DEMAND

LOSS FACTOR LEVEL	CUSTOMER SALES MW a	SALES ADJUST b	CALC LOSS TO LEVEL c	SALES MW @ GEN d	CUM PEAK EXPANSION FACTORS e	f=1/e
BULK LINES	0.0	0.0	0.0	0.0	0.00000	0.00000
TRANS SUBS	0.0	0.0	0.0	0.0	0.00000	0.00000
TRANS LINES	0.0	0.0	0.0	0.0	0.00000	0.00000
SUBTRANS SUBS	0.0	0.0	0.0	0.0	0.00000	0.00000
TOTAL TRANS	0.0	0.0	0.0	0.0	1.03000	0.97087
PRIM SUBS	4.0	0.0	0.1	4.1	1.03587	0.96537
PRIM LINES	68.0	0.0	3.9	71.9	1.05695	0.94612
SECONDARY	1,392.6	0.0	106.4	1,499.0	1.07642	0.92900
			110.4			
TOTALS	1,464.6	0.0	110.4	1,575.0		

DEVELOPMENT of LOSS FACTORS
ADJUSTED
ENERGY

LOSS FACTOR LEVEL	CUSTOMER SALES MWH a	SALES ADJUST b	CALC LOSS TO LEVEL c	SALES MWH @ GEN d	CUM ANNUAL EXPANSION FACTORS e	f=1/e
BULK LINES	0	0	0	0	0.00000	0.00000
TRANS SUBS	0	0	0	0	0.00000	0.00000
TRANS LINES	0	0	0	0	0.00000	0.00000
SUBTRANS SUBS	0	0	0	0	0.00000	0.00000
TOTAL TRANS	0	0	0	0	1.03000	0.97087
PRIM SUBS	23,601	0	888	24,489	1.03762	0.96374
PRIM LINES	397,186	0	19,891	417,077	1.05008	0.95231
SECONDARY	5,749,335	0	409,099	6,158,434	1.07116	0.93357
			429,878			
TOTALS	6,170,122	0	429,878	6,600,000		

ESTIMATED VALUES AT GENERATION

LOSS FACTOR AT VOLTAGE LEVEL	MW	MWH
BULK LINES	0.00	0
TRANS SUBS	0.00	0
TRANS LINES	0.00	0
SUBTRANS SUBS	0.00	0
SUBTRANS LINES	0.00	0
PRIM SUBS	4.14	24,489
PRIM LINES	71.87	417,077
SECONDARY	1,498.98	6,158,434
	1,575.00	6,600,000
ACTUAL ENERGY	1,575.00	6,600,000
MISMATCH	0.00	0
% MISMATCH	0.00%	0.00%

Adjusted Losses and Loss Factors by Facility EXHIBIT 8

Unadjusted Losses by Segment

	MW	Unadjusted	MWH	Unadjusted
Service Drop Losses	3.78	3.77	10,723	10,721
Secondary Losses	2.60	2.60	4,065	4,064
Line Transformer Losses	16.69	16.64	99,928	99,912
Primary Line Losses	27.20	27.10	74,721	74,709
Distribution Substation Losses	7.80	7.77	46,804	46,797
Transmission System Losses	45.87	45.87	192,233	192,233
Total	103.95	103.75	428,475	428,436

Mismatch Allocation by Segment

	MW	MWH
Service Drop Losses	-0.44	-65
Secondary Losses	-0.30	-25
Line Transformer Losses	-1.92	-610
Primary Line Losses	-3.13	-456
Distribution Substation Losses	-0.90	-286
Transmission System Losses	0.00	0
Total	-6.69	-1,442

Adjusted Losses by Segment

	MW	% of Total	MWH	% of Total
Service Drop Losses	4.20	3.8%	10,787	2.5%
Secondary Losses	2.90	2.6%	4,089	1.0%
Line Transformer Losses	18.56	16.8%	100,522	23.4%
Primary Line Losses	30.24	27.4%	75,165	17.5%
Distribution Substation Losses	8.67	7.9%	47,082	11.0%
Transmission System Losses	45.87	41.5%	192,233	44.7%
Total	110.44	100.0%	429,878	100.0%

Loss Factors by Segment	**MW**	**MWH**	
Retail Sales from Service Drops	1,392.560	5,749,335	
Adjusted Service Drop Losses	4.203	10,787	
Input to Service Drops	1,396.763	5,760,122	
Service Drop Loss Factor	**1.00302**	**1.00188**	
Output from Secondary	1,396.763	5,760,122	
Adjusted Secondary Losses	2.896	4,089	
Input to Secondary	1,399.659	5,764,211	
Secondary Conductor Loss Factor	**1.00207**	**1.00071**	
Output from Line Transformers	1,399.659	5,764,211	
Adjusted Line Transformer Losses	18.561	100,522	
Input to Line Transformers	1,418.220	5,864,733	
Line Transformer Loss Factor	**1.01326**	**1.01744**	
Retail Sales from Primary	68.000	397,186	
Req. Whls Sales from Primary	0.000	0	
Input to Line Transformers	1,418.220	5,864,733	
Output from Primary Lines	1,486.220	6,261,919	
Adjusted Primary Line Losses	30.235	75,165	
Input to Primary Lines	1,516.455	6,337,084	
Primary Line Loss Factor	**1.02034**	**1.01200**	
Output PI from Distribution Substations	1,516.455	6,337,084	
Req. Whls Sales from Substations	0.000	0	
Retail Sales from Substations	4.000	23,601	
TotalOutput from Distribution Substations	1,520.455	6,360,685	
Adjusted Distribution Substation Losses	8.671	47,082	
Input to Distribution Substations	1,529.126	6,407,767	
Distribution Substation Loss Factor	**1.00570**	**1.00740**	
Retail Sales at from SubTransmission	0.000	0	
Req. Whls Sales from SubTransmission	0.000	0	
Non-Req. Whls Sales from SubTransmission	0.000	0	
Losses	0.000	0	4678
Input to Distribution Substations	1,529.126	6,407,767	
Output from SubTransmission	1,529.126	6,407,767	1,575.000
SubTransmission System Losses	45.874	192,233	45.874
Input to Transmission	1,575.000	6,600,000	45.874
TotTransmission System Loss Factor	**1.03000**	**1.03000**	45.874

DEMAND MW **SUMMARY OF LOSSES AND LOSS FACTORS BY DELIVERY VOLTAGE** **EXHIBIT 9**

	SERVICE LEVEL		SALES MW	LOSSES	SECONDARY	PRIMARY	SUBSTATION	SUBTRANS	TRANSMISSION	
1	**SERVICES**									
2	SALES		1,392.6		1,392.6					
3	LOSSES			4.2	4.2					
4	INPUT				1,396.8					
5	**EXPANSION FACTOR**	**1.00302**								
6	**SECONDARY**									
7	SALES									
8	LOSSES			2.9	2.9					
9	INPUT				1,399.7					
10	**EXPANSION FACTOR**	**1.00207**								
11	**LINE TRANSFORMER**									
12	SALES									
13	LOSSES			18.6	18.6					
14	INPUT				1,418.2					
15	**EXPANSION FACTOR**	**1.01326**								
16	**PRIMARY**									
17	SECONDARY				1,418.2					
18	SALES		68.0			68.0				
19	LOSSES			30.2	28.9	1.4				
20	INPUT				1,447.1	69.4				
21	**EXPANSION FACTOR**	**1.02034**								
22	**SUBSTATION**									
23	PRIMARY				1,447.1	69.4				
24	SALES		4.0				4.0			
25	LOSSES			8.7	8.3	0.4	0.0			
26	INPUT				1,455.3	69.8	4.0			
27	**EXPANSION FACTOR**	**1.00570**								
28	**SUB-TRANSMISSION**									
29	DISTRIBUTION SUBS									
30	SALES									
31	LOSSES									
32	INPUT									
33	**EXPANSION FACTOR**									
34	**TRANSMISSION**									
35	SUBTRANSMISSION									
36	DISTRIBUTION SUBS				1,455.3	69.8	4.0			
37	SALES		0.0							0.0
38	LOSSES			45.9	43.7	2.1	0.1			0.0
39	INPUT				1,499.0	71.9	4.1			0.0
40	**EXPANSION FACTOR**	**1.03000**								
41	**TOTALS**	LOSSES		110.4	106.4	3.9	0.1			0.0
42		% OF TOTAL		100%	96.36%	3.51%	0.13%			0.00%
43		SALES	1,464.6		1,392.6	68.0	4.0			0.0
44		% OF TOTAL	100.00%		95.08%	4.64%	0.27%			0.00%
45		INPUT	1,575.0		1,499.0	71.9	4.1			0.0
46	**CUMMULATIVE EXPANSION LOSS FACTORS**				**1.07642**	**1.05695**	**1.03587**		**NA**	
	(from meter to system input)				1.09238					

ENERGY MWH **SUMMARY OF LOSSES AND LOSS FACTORS BY DELIVERY VOLTAGE** **EXHIBIT 9**

	SERVICE LEVEL		SALES	LOSSES	SECONDARY	PRIMARY	SUBSTATION	SUBTRANS	TRANSMISSION	
1	**SERVICES**									
2	SALES		5,749,335		5,749,335					
3	LOSSES			10,787	10,787					
4	INPUT				5,760,122					
5	**EXPANSION FACTOR**	**1.00188**								
6	**SECONDARY**									
7	SALES									
8	LOSSES			4,089	4,089					
9	INPUT				5,764,211					
10	**EXPANSION FACTOR**	**1.00071**								
11	**LINE TRANSFORMER**									
12	SALES									
13	LOSSES			100,522	100,522					
14	INPUT				5,864,733					
15	**EXPANSION FACTOR**	**1.01744**								
16	**PRIMARY**									
17	SECONDARY				5,864,733					
18	SALES		397,186.000			397,186				
19	LOSSES			75,165	70,397	4,768				
20	INPUT				5,935,130	401,954				
21	**EXPANSION FACTOR**	**1.01200**								
22	**SUBSTATION**									
23	PRIMARY				5,935,130	401,954				
24	SALES		23,601				23,601			
25	LOSSES			47,082	43,932	2,975	175			
26	INPUT				5,979,062	404,929	23,776			
27	**EXPANSION FACTOR**	**1.00740**								
28	**SUB-TRANSMISSION**									
29	DISTRIBUTION SUBS									
30	SALES									
31	LOSSES									
32	INPUT									
33	**EXPANSION FACTOR**									
34	**TRANSMISSION**									
35	SUBTRANSMISSION									
36	DISTRIBUTION SUBS				5,979,062	404,929	23,776			
37	SALES		0							0
38	LOSSES			192,233	179,372	12,148	713			0
39	INPUT				6,158,434	417,077	24,489			0
40	**EXPANSION FACTOR**	**1.03000**								
41	**TOTALS**	LOSSES		429,878	409,099	19,891	888			0
42		% OF TOTAL		100%	95.17%	4.63%	0.21%			0.00%
43		SALES	6,170,122		5,749,335	397,186	23,601			0
44		% OF TOTAL	100.00%		93.18%	6.44%	0.38%			0.00%
45		INPUT	6,600,000		6,158,434	417,077	24,489			0
46	**CUMMULATIVE EXPANSION LOSS FACTORS** (from meter to system input)				**1.07116**	**1.05008**	**1.03762**		**NA**	

KCPL KS & MO **DEVELOPMENT of LOSS FACTORS** **EXHIBIT 10**
COMPOSITE **ADJUSTED** **EXHIBIT 7** PAGE 1 OF 2
LOSS FACTORS **DEMAND**

LOSS FACTOR LEVEL	CUSTOMER SALES MW a	SALES ADJUST b	CALC LOSS TO LEVEL c	SALES MW @ GEN d	CUM PEAK FACTORS e	EXPANTION f=1/e	
BULK LINES	0.0	0.0	0.0	0.0	0.00000	0.00000	
TRANS SUBS	0.0	0.0	0.0	0.0	0.00000	0.00000	
TRANS LINES	0.0	0.0	0.0	0.0	0.00000	0.00000	
TOTAL TRANS	0.0	0.0	0.0	0.0	0.00000	0.97824	
SUBTRANS	40.0	0.0	1.2	41.2	1.03000	0.97824	
PRIM SUBS	33.0	0.0	1.2	34.2	1.03694	0.96437	
PRIM LINES	147.3	0.0	8.5	155.8	1.05786	0.94061	
SECONDARY	2,851.0	0.0	223.0	3,074.1	1.07822	0.91849	
TOTALS	3,071.3	0.0	234.0	3,305.3	1.07618	<COMPOSITE	

DEVELOPMENT of LOSS FACTORS
ADJUSTED
ENERGY

LOSS FACTOR LEVEL	CUSTOMER SALES MWH a	SALES **ADJUST** b	CALC LOSS TO LEVEL c	SALES MWH @ GEN d	CUM ANNUAL FACTORS e	EXPANTION f=1/e	
BULK LINES	0	0	0	0	0.00000	0.00000	
TRANS SUBS	0	0	0	0	0.00000	0.00000	
TRANS LINES	0	0	0	0	0.00000	0.00000	
TOTAL TRANS	0	0	0	0	0.00000	0.00000	
SUBTRANS	340959	0	10229	351188	1.03000	0.97087	
PRIM SUBS	269,877	0	10,188	280,065	1.03775	0.96362	
PRIM LINES	1,017,249	0	50,676	1,067,925	1.04982	0.95255	
SECONDARY	12,617,891	0	882,932	13,500,823	1.06997	0.93460	
TOTAL	14,245,976	0	954,024	15,200,000	1.06697	<COMPOSITE	

KCPL Kansas

DEVELOPMENT of LOSS FACTORS
ADJUSTED DEMAND **EXHIBIT 7**

LOSS FACTOR LEVEL	CUSTOMER SALES MW a	SALES ADJUST b	CALC LOSS TO LEVEL c	SALES MW @ GEN d	CUM PEAK FACTORS e	EXPANTION f=1/e	
BULK LINES	0.0	0	0	0.0	0.00000	0.00000	
TRANS SUBS	0.0	0	0	0.0	0.00000	0.00000	
TRANS LINES	0.0	0	0	0.0	0.00000	0.00000	
TOTAL TRANS	0.0	0.0	0.0	0.0	0.00000	0.91849	
SUBTRANS	0.0	0.0	0.0	0.0	0.00000	0.91849	
PRIM SUBS	4.0	0.0	0.1	4.1	1.03587	0.91849	
PRIM LINES	68.0	0.0	3.9	71.9	1.05695	0.91849	
SECONDARY	1,392.6	0.0	106.4	1,499.0	1.07642	0.91849	
TOTALS	1,464.6	0.0	110.4	1,575.0	1.07541	<COMPOSITE	

DEVELOPMENT of LOSS FACTORS
ADJUSTED ENERGY

LOSS FACTOR LEVEL	CUSTOMER SALES MWH a	SALES **ADJUST** b	CALC LOSS TO LEVEL c	SALES MWH @ GEN d	CUM ANNUAL FACTORS e	EXPANTION f=1/e	
BULK LINES	0	0	0	0	0.00000	0.00000	
TRANS SUBS	0	0	0	0	0.00000	0.00000	
TRANS LINES	0	0	0	0	0.00000	0.00000	
TOTAL TRANS	0	0	0	0	0.00000	0.00000	
SUBTRANS	0	0	0	0	0.00000	0.00000	
PRIM SUBS	23,601	0	888	24,489	1.03762	0.96374	
PRIM LINES	397,186	0	19,891	417,077	1.05008	0.95231	
SECONDARY	5,749,335	0	409,099	6,158,434	1.07116	0.93357	
TOTAL	6,170,122	0	429,878	6,600,000	1.06967	<COMPOSITE	

KCPL Missouri

DEVELOPMENT of LOSS FACTORS
ADJUSTED DEMAND **EXHIBIT 7**

LOSS FACTOR LEVEL	CUSTOMER SALES MW a	SALES ADJUST b	CALC LOSS TO LEVEL c	SALES MW @ GEN d	CUM PEAK FACTORS e	EXPANTION f=1/e	
BULK LINES	0.0	0	0	0.0	0.00000	0.00000	
TRANS SUBS	0.0	0	0	0.0	0.00000	0.00000	
TRANS LINES	0.0	0	0	0.0	0.00000	0.00000	
TOTAL TRANS	0.0	0.0	0.0	0.0	0.00000	0.00000	
SUBTRANS	40.0	0.0	1.2	41.2	1.03000	0.97087	
PRIM SUBS	29.0	0.0	1.1	30.1	1.03709	0.96424	
PRIM LINES	79.3	0.0	4.6	83.9	1.05865	0.94460	
SECONDARY	1458.5	0.0	116.6	1575.1	1.07994	0.92597	
TOTALS	1,606.7	0.0	123.5	1,730.3	1.07688	<COMPOSITE	

DEVELOPMENT of LOSS FACTORS
ADJUSTED ENERGY

LOSS FACTOR LEVEL	CUSTOMER SALES MWH a	SALES **ADJUST** b	CALC LOSS TO LEVEL c	SALES MWH @ GEN d	CUM ANNUAL FACTORS e	EXPANTION f=1/e	
BULK LINES	0	0	0	0	0.00000	0.00000	
TRANS SUBS	0	0	0	0	0.00000	0.00000	
TRANS LINES	0	0	0	0	0.00000	0.00000	
TOTAL TRANS	0	0	0	0	0.00000	0.00000	
SUBTRANS	340,959	0	10,229	351,188	1.03000	0.97087	
PRIM SUBS	246,276	0	9,300	255,576	1.03776	0.96361	
PRIM LINES	620,063	0	30,785	650,848	1.04965	0.95270	
SECONDARY	6,868,556	0	473,832	7,342,388	1.06899	0.93547	
TOTAL	8,075,854	0	524,146	8,600,000	1.06490	<COMPOSITE	

Appendix C

Results of 2020 Evergy Missouri West (MO West)

(NOTE: All of the 0.000 high voltage values shown on Exhibits 2, 3, and 5 reflect results that have been included in the loss factor estimates of Exhibit 5, line 22, TOT TRANS LOSS FAC.)

MO WEST

EXHIBIT 1

SUMMARY OF COMPANY DATA

ANNUAL PEAK	1,845	MW
ANNUAL SYSTEM INPUT	8,583,034	MWH
ANNUAL SALES	8,008,468	MWH
SYSTEM LOSSES @ INPUT	574,566	or 6.69%
SYSTEM LOAD FACTOR	53.0%	

SUMMARY OF LOSSES - OUTPUT RESULTS

SERVICE	KV	--- MW --- Input	% TOTAL	--- MWH --- Input	% TOTAL
TRANS	345,161,115	53.7	40.69%	249,991	43.51%
	69,66,35	2.91%		2.91%	
PRIM SUBS	33,12,1	12.3	9.31%	68,559	11.93%
		0.67%		0.80%	
PRIMARY	33,12,1	30.5	23.08%	84,124	14.64%
		1.65%		0.98%	
SECONDARY	120/240,to,477	35.5	26.91%	171,892	29.92%
		1.93%		2.00%	
TOTAL		132.0	100.00%	574,566	100.00%
		7.16%		6.69%	

SUMMARY OF LOSS FACTORS

SERVICE	KV	CUMMULATIVE SALES EXPANSION FACTORS DEMAND (Peak) d	1/d	ENERGY (Annual) e	1/e
TOT TRANS	345,161,115 69,66,35	1.03000	0.97087	1.03000	0.97087
PRIM SUBS	33,12	1.03724	0.96410	1.03880	0.96265
PRIMARY	33,12,1	1.05618	0.94681	1.05026	0.95215
SECONDARY	120/240,to,477	1.08050	0.92550	1.07664	0.92881

SUMMARY OF CONDUCTOR INFORMATION

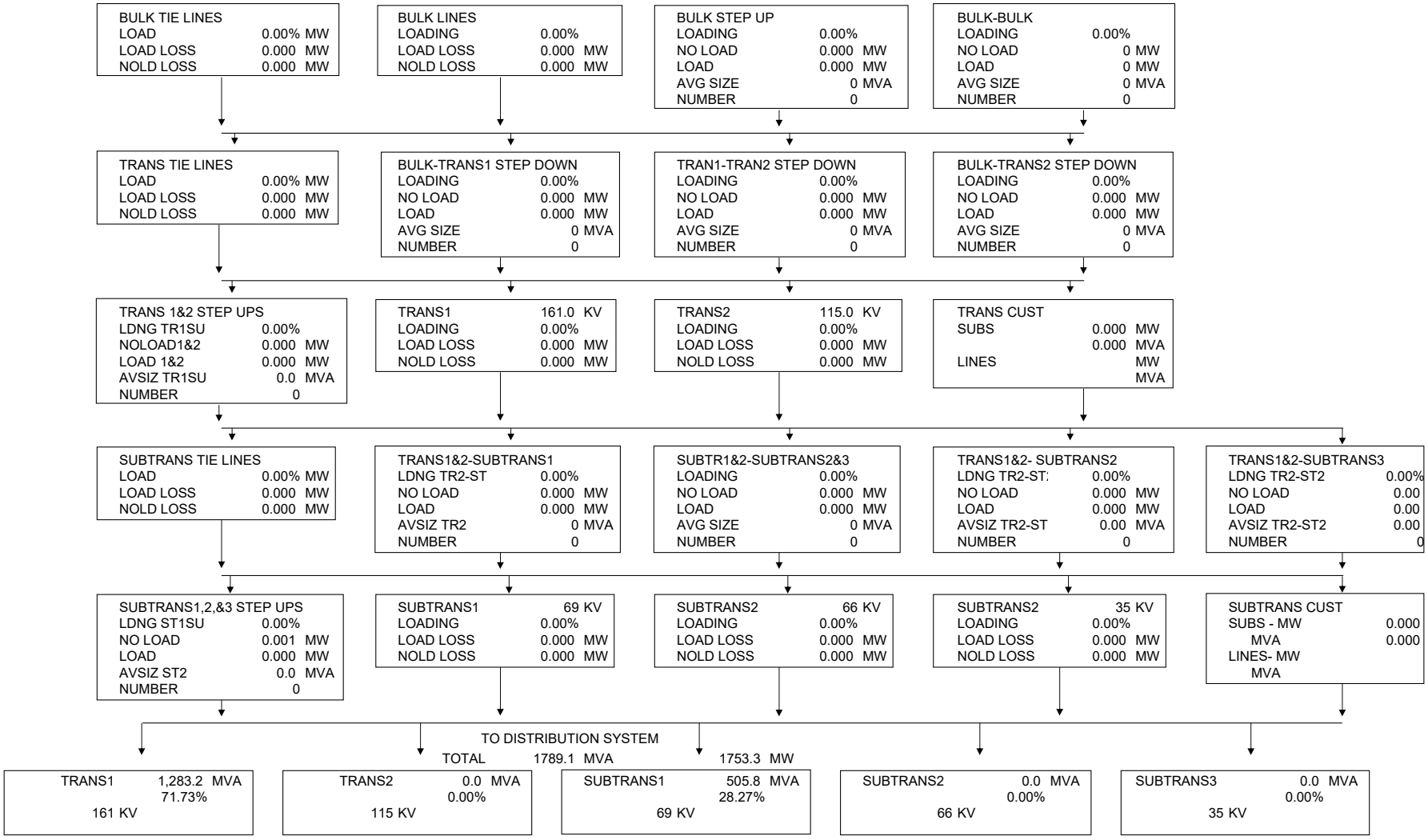
EXHIBIT 2

DESCRIPTION		CIRCUIT MILES	LOADING % RATING	----- MW LOSSES ----- LOAD	NO LOAD	TOTAL	---- MWH LOSSES ---- LOAD	NO LOAD	TOTAL
--- BULK ----------	345 KV OR GREATER ----------								
TIE LINES		0.0	0.00%	0.000	0.000	0.000	0	0	0
BULK TRANS		0.0	0.00%	0.000	0.000	0.000	0	0	0
SUBTOT		0.0		0.000	0.000	0.000	0	0	0
--- TRANS ---------	115 KV TO 345.00 KV								
TIE LINES		0	0.00%	0.000	0.000	0.000	0	0	0
TRANS1	161 KV	0.0	0.00%	0.000	0.000	0.000	0	0	0
TRANS2	115 KV	0.0	0.00%	0.000	0.000	0.000	0	0	0
SUBTOT		0.0		0.000	0.000	0.000	0	0	0
--- SUBTRANS ------	35 KV TO 115 KV								
TIE LINES		0	0.00%	0.000	0.000	0.000	0	0	0
SUBTRANS1	69 KV	0.0	0.00%	0.000	0.000	0.000	0	0	0
SUBTRANS2	66 KV	0.0	0.00%	0.000	0.000	0.000	0	0	0
SUBTRANS3	35 KV	0.0	0.00%	0.000	0.000	0.000	0	3	3
SUBTOT		0.0		0.000	0.000	0.000	0	3	3
PRIMARY LINES		11,011		23.725	2.708	26.433	57,165	23,786	80,951
SECONDARY LINES		4,305		4.024	0.000	4.024	7,528	0	7,528
SERVICES		4,795		4.469	0.716	5.185	11,960	6,293	18,254
TOTAL		20,112		32.218	3.425	35.643	76,654	30,082	106,736

SUMMARY OF TRANSFORMER INFORMATION EXHIBIT 3

DESCRIPTION	KV CAPACITY VOLTAGE	MVA	NUMBER TRANSFMR	AVERAGE SIZE	LOADING %	MVA LOAD	MW LOSSES LOAD	MW LOSSES NO LOAD	MW LOSSES TOTAL	MWH LOSSES LOAD	MWH LOSSES NO LOAD	MWH LOSSES TOTAL
BULK STEP-UP	345	0.0	0	0.0	0.00%	0	0.000	0.000	0.000	0	0	0
BULK - BULK		0.0	0	0.0	0.00%	0	0.000	0.000	0.000	0	0	0
BULK - TRANS1	161	0.0	0	0.0	0.00%	0	0.000	0.000	0.000	0	0	0
BULK - TRANS2	115	0.0	0	0.0	0.00%	0	0.000	0.000	0.000	0	0	0
TRANS1 STEP-UP	161	0.0	0	0.0	0.00%	0	0.000	0.000	0.000	0	0	0
TRANS1 - TRANS2	115	0.0	0	0.0	0.00%	0	0.000	0.000	0.000	0	0	0
TRANS1-SUBTRANS1	69	0.0	0	0.0	0.00%	0	0.000	0.000	0.000	0	0	0
TRANS1-SUBTRANS2	66	0.0	0	0.0	0.00%	0	0.000	0.000	0.000	0	0	0
TRANS1-SUBTRANS3	35	0.0	0	0.0	0.00%	0	0.000	0.000	0.000	0	0	0
TRANS2 STEP-UP	115	0.0	0	0.0	0.00%	0	0.000	0.000	0.000	0	0	0
TRANS2-SUBTRANS1	69	0.0	0	0.0	0.00%	0	0.000	0.000	0.000	0	0	0
TRANS2-SUBTRANS2	66	0.0	0	0.0	0.00%	0	0.000	0.000	0.000	0	0	0
TRANS2-SUBTRANS3	35	0.0	0	0.0	0.00%	0	0.000	0.000	0.000	0	0	0
SUBTRAN1 STEP-UP	69	0.0	0	0.0	0.00%	0	0.000	0.000	0.000	0	0	0
SUBTRAN2 STEP-UP	66	0.0	0	0.0	0.00%	0	0.000	0.001	0.001	0	0	0
SUBTRAN3 STEP-UP	35	0.0	0	0.0	0.00%	0	0.000	0.000	0.000	0	0	0
SUBTRAN1-SUBTRAN2	66	0.0	0	0.0	0.00%	0	0.000	0.000	0.000	0	0	0
SUBTRAN1-SUBTRAN3	35	0.0	0	0.0	0.00%	0	0.000	0.000	0.000	0	0	0
SUBTRAN2-SUBTRAN3	35	0.0	0	0.0	0.00%	0	0.000	0.000	0.000	0	0	0
DISTRIBUTION SUBSTATIONS												
TRANS1 - 161	33	495.7	8	62.0	40.16%	199	0.388	0.614	1.002	1,226	5,391	6,617
TRANS1 - 161	12	2,684.9	94	28.6	40.38%	1,084	2.448	3.597	6.045	7,553	31,597	39,150
TRANS1 - 161	1	0.0	0	0.0	0.00%	0	0.000	0.000	0.000	0	0	0
TRANS2 - 115	33	0.0	0	0.0	0.00%	0	0.000	0.000	0.000	0	0	0
TRANS2 - 115	12	0.0	0	0.0	0.00%	0	0.000	0.000	0.000	0	0	0
TRANS2 - 115	1	0.0	0	0.0	0.00%	0	0.000	0.000	0.000	0	0	0
SUBTRAN1- 69	33	156.2	14	11.2	28.48%	44	0.099	0.236	0.335	305	2,077	2,382
SUBTRAN1- 69	12	850.7	61	13.9	46.99%	400	1.777	1.290	3.067	5,095	11,331	16,425
SUBTRAN1- 69	1	139.9	17	8.2	44.08%	62	0.239	0.238	0.478	694	2,094	2,787
SUBTRAN2- 66	33	0.0	0	0.0	0.00%	0	0.000	0.000	0.000	0	0	0
SUBTRAN2- 66	12	0.0	0	0.0	0.00%	0	0.000	0.000	0.000	0	0	0
SUBTRAN2- 66	1	0.0	0	0.0	0.00%	0	0.000	0.000	0.000	0	0	0
SUBTRAN3- 35	33	0.0	0	0.0	0.00%	0	0.000	0.000	0.000	0	0	0
SUBTRAN3- 35	12	0.0	0	0.0	0.00%	0	0.000	0.000	0.000	0	0	0
SUBTRAN3- 35	1	0.0	0	0.0	0.00%	0	0.000	0.000	0.000	0	0	0
PRIMARY - PRIMARY		371.6	84	4.4	44.90%	167	0.646	0.621	1.267	1,705	5,453	7,158
LINE TRANSFRMR		5,415.2	101,346	53.4	31.82%	1,723	7.506	14.858	22.364	12,602	130,509	143,111
TOTAL		10,114	101,624				13.103	21.455	34.558	29,180	188,452	217,632

SUMMARY OF LOSSES DIAGRAM - DEMAND MODEL - SYSTEM PEAK 1844.7 MW



FROM HIGH VOLTAGE SYSTEM

TOTAL 1,789 MVA 1,753 MW

TRANS1	TRANS2	SUBTRANS1	SUBTRANS2	SUBTRANS3
1,283.2 MVA	0.0 MVA	505.8 MVA	0.0 MVA	0.0 MVA
71.73%	0.00%	28.27%	0.00%	0.00%
161 KV	115 KV	69 KV	66 KV	35 KV

DISTRIBUTION SYSTEM LOAD

	PRIM1	PRIM2	PRIM3	PRIM1	PRIM2	PRIM3	PRIM1	PRIM2	PRIM3	PRIM1	PRIM2	PRIM3	PRIM1	PRIM2	PRIM3	PRIM1	PRIM2	PRIM3
VOLTAGE	33	12	1	33	12	1	33	12	1	33	12	1	33	12	1	33	12	1
LOAD MVA	199	1,084	0	0	0	0	44	400	62	0	0	0	0	0	0	0	0	0
% SYS TOT	11.13%	60.60%	0.00%	0.00%	0.00%	0.00%	2.49%	22.34%	3.45%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
NOLD LOSS	0.614	3.597	0.000	0.000	0.000	0.000	0.236	1.290	0.238	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
LOAD LOSS	0.388	2.448	0.000	0.000	0.000	0.000	0.099	1.777	0.239	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
AVG SIZE	62.0	28.6	0.0	0.0	0.0	0.0	11.2	13.9	8.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NUMBER	8	94	0	0	0	0	14	61	17	0	0	0	0	0	0	0	0	0
DIVERSITY	1.000	1.000	0.000	0.000	0.000	0.000	1.000	1.000	1.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
RATIO																		

PRIMARY LINES		
LOADING	1693.036	MW
@ SYS PF	1727.588	MVA
LOAD LOSS	23.725	MW
NOLD LOSS	2.708	MW
TOT LOSS	26.433	MW

PRIM/PRIM TRANSF		
LOADING	166.842	MW
NOLD LOSS	0.621	MW
LOAD LOSS	0.646	MW
AVG SIZE	4.42	
NUMBER	84	

PRIM CUST LOADS		
NO LINES	0.000	MW
CUST SUB	0.000	MVA
NO LINES	49.400	MW
CO. SUB	50.408	MVA
PRIM WITH	90.700	MW
LINES	98.587	MVA

LINE TRANSFORMERS				
LOADING	1574.637	MW	MVA	1745.372
NOLD LOSS	14.858	MW		
LOAD LOSS	7.506	MW		
AVG SIZE	53.4	KVA		
NUMBER	101346			

SECONDARY LINES		
LOAD	586.407	MW
LOAD LOSS	4.024	MW
NOLD LOSS	0.000	MW
TOT LOSS	4.024	MW

NO SECONDARY LINES		
LOAD	965.866	MW

SERVICES		
LOAD	1548.249	MW
LOAD LOSS	4.469	MW
NOLD LOSS	0.716	MW
TOT LOSS	5.185	MW

CUSTOMER SECONDARY LOAD	
1543.064	MW

SUMMARY of SALES and CALCULATED LOSSES

EXHIBIT 5

LOSS # AND LEVEL	MW LOAD	NO LOAD	+ LOAD	= TOT LOSS	EXP FACTOR	CUM EXP FAC	MWH LOAD	NO LOAD	+ LOAD	= TOT LOSS	EXP FACTOR	CUM EXP FAC
1 BULK XFMMR	0.0	0.00	0.00	0.00	0.000000	0.000000	0	0	0	0	0	0
2 BULK LINES	0.0	0.00	0.00	0.00	0.000000	0.000000	0	0	0	0	0.0000000	0.0000000
3 TRANS1 XFMR	0.0	0.00	0.00	0.00	0.000000	0.000000	0	0	0	0	0.0000000	0.0000000
4 TRANS1 LINES	0.0	0.00	0.00	0.00	0.000000	0.000000	0	0	0	0	0.0000000	0.0000000
5 TRANS2TR1 SD	0.0	0.00	0.00	0.00	0.000000	0.000000	0	0	0	0	0.0000000	0.0000000
6 TRANS2BLK SD	0.0	0.00	0.00	0.00	0.000000	0.000000	0	0	0	0	0.0000000	0.0000000
7 TRANS2 LINES	0.0	0.00	0.00	0.00	0.000000	0.000000	0	0	0	0	0.0000000	0.0000000
TOTAL TRAN	0.0	0.00	0.00	0.00	0.000000	0.000000	0	0	0	0	0.0000000	0.0000000
8 STR1BLK SD												
9 STR1T1 SD	0.0	0.00	0.00	0.00	0.000000	0.000000	0	0	0	0	0.0000000	0.0000000
10 SRT1T2 SD	0.0	0.00	0.00	0.00	0.000000	0.000000	0	0	0	0	0.0000000	0.0000000
11 SUBTRANS1 LINES	0.0	0.00	0.00	0.00	0.000000	0.000000	0	0	0	0	0.0000000	0.0000000
12 STR2T1 SD	0.0	0.00	0.00	0.00	0.000000	0.000000	0	0	0	0	0.0000000	0.0000000
13 STR2T2 SD	0.0	0.00	0.00	0.00	0.000000	0.000000	0	0	0	0	0.0000000	0.0000000
14 STR2S1 SD	0.0	0.00	0.00	0.00	0.000000	0.000000	0	0	0	0	0.0000000	0.0000000
15 SUBTRANS2 LINES	0.0	0.00	0.00	0.00	0.000000	0.000000	0	0	0	0	0.0000000	0.0000000
16 STR3T1 SD	0.0	0.00	0.00	0.00	0.000000	0.000000	0	0	0	0	0.0000000	0.0000000
17 STR3T2 SD	0.0	0.00	0.00	0.00	0.000000	0.000000	0	0	0	0	0.0000000	0.0000000
18 STR3S1 SD	0.0	0.00	0.00	0.00	0.000000	0.000000	0	0	0	0	0.0000000	0.0000000
19 STR3S2 SD	0.0	0.00	0.00	0.00	0.000000	0.000000	0	0	0	0	0.0000000	0.0000000
20 SUBTRANS3 LINES	0.0	0.00	0.00	0.00	0.000000		0	3	0	3	0.0000000	
21 SUBTRANS TOTAL	0.0	0.00	0.00	0.00	0.000000	**FERC OATT**	0	3	0	3	0.0000000	**FERC OATT**
22 TOT TRANS LOSS FAC	**1,844.7**	**6.45**	**47.28**	**53.73**	**1.030000**	**1.030000**	**8,583,034**	**56,635**	**193,356**	**249,991**	**1.0300000**	**1.0300000**
DISTRIBUTION SUBST												
TRANS1	1,257.6	4.21	2.84	7.05	1.005635	0.000000	5,799,363	36,989	8,779	45,767	1.0079546	0.0000000
TRANS2	0.0	0.00	0.00	0.00	0.000000	0.000000	0	0	0	0	0.0000000	0.0000000
SUBTR1	495.7	1.76	2.12	3.88	1.007889	0.000000	2,286,014	15,502	6,093	21,595	1.0095368	0.0000000
SUBTR2	0.0	0.00	0.00	0.00	0.000000	0.000000	0	0	0	0	0.0000000	0.0000000
SUBTR3	0.0	0.00	0.00	0.00	0.000000	0.000000	0	0	0	0	0.0000000	0.0000000
WEIGHTED AVERAGE	1,753.3	5.98	4.95	10.93	1.006271	1.036460	8,085,377	52,490	14,872	67,363	1.0084014	1.0386535
PRIMARY INTRCHNGE	0.0				0.000000		0				0.0000000	
PRIMARY LINES	1,692.4	2.71	24.37	27.08	1.016260	1.053313	7,706,716	23,786	58,870	82,656	1.0108415	1.0499140
LINE TRANSF	1,574.6	14.86	7.51	22.36	1.014407	1.068488	7,012,018	130,509	12,602	143,111	1.0208346	1.0717885
SECONDARY	1,552.3	0.00	4.02	4.02	1.002599	1.071265	6,868,907	0	7,528	7,528	1.0010972	1.0729645
SERVICES	1,548.2	0.72	4.47	5.19	1.003360	1.074865	6,861,379	6,293	11,960	18,254	1.0026674	1.0758266
TOTAL SYSTEM		30.71	92.60	123.31				269,713	299,190	568,903		

DEVELOPMENT of LOSS FACTORS EXHIBIT 6

UNADJUSTED
DEMAND

LOSS FACTOR LEVEL	CUSTOMER SALES MW a	CALC LOSS TO LEVEL b	SALES MW @ GEN c	CUM PEAK EXPANSION FACTORS d	1/d
BULK LINES	0.0	0.0	0.0	0.00000	0.00000
TRANS SUBS	0.0	0.0	0.0	0.00000	0.00000
TRANS LINES	0.0	0.0	0.0	0.00000	0.00000
SUBTRANS SUBS	0.0	0.0	0.0	0.00000	0.00000
TOTAL TRANS	29.5	0.9	30.4	1.03000	0.97087
PRIM SUBS	49.4	1.8	51.2	1.03646	0.96482
PRIM LINES	90.7	4.8	95.5	1.05331	0.94939
SECONDARY	1,543.1	115.5	1,658.6	1.07486	0.93035
TOTALS	1,712.7	123.0	1,835.7		

DEVELOPMENT of LOSS FACTORS
UNADJUSTED
ENERGY

LOSS FACTOR LEVEL	CUSTOMER SALES MWH a	CALC LOSS TO LEVEL b	SALES MWH @ GEN c	CUM ANNUAL EXPANSION FACTORS d	1/d
BULK LINES	0	0	0	0.00000	0.00000
TRANS SUBS	0	0	0	0.00000	0.00000
TRANS LINES	0	0	0	0.00000	0.00000
SUBTRANS SUBS	0	0	0	0.00000	0.00000
TOTAL TRANS	241,668	7,250	248,918	1.03000	0.97087
PRIM SUBS	311,633	12,046	323,679	1.03865	0.96279
PRIM LINES	612,042	30,549	642,591	1.04991	0.95246
SECONDARY	6,843,125	518,891	7,362,016	1.07583	0.92952
TOTALS	8,008,468	568,736	8,577,204		

ESTIMATED VALUES AT GENERATION

LOSS FACTOR AT VOLTAGE LEVEL	MW	MWH
BULK LINES	0.00	0
TRANS SUBS	0.00	0
TRANS LINES	0.00	0
SUBTRANS SUBS	0.00	0
SUBTRANS LINES	30.39	248,918
PRIM SUBS	51.20	323,679
PRIM LINES	95.54	642,591
SECONDARY	1,658.58	7,362,016
SUBTOTAL	1,835.71	8,577,204
ACTUAL ENERGY	1,844.70	8,583,034
MISMATCH	(8.99)	(5,830)
% MISMATCH	-0.49%	-0.07%

DEVELOPMENT of LOSS FACTORS EXHIBIT 7

ADJUSTED
DEMAND

LOSS FACTOR LEVEL	CUSTOMER SALES MW a	SALES ADJUST b	CALC LOSS TO LEVEL c	SALES MW @ GEN d	CUM PEAK EXPANSION FACTORS e	f=1/e
BULK LINES	0.0	0.0	0.0	0.0	0.00000	0.00000
TRANS SUBS	0.0	0.0	0.0	0.0	0.00000	0.00000
TRANS LINES	0.0	0.0	0.0	0.0	0.00000	0.00000
SUBTRANS SUBS	0.0	0.0	0.0	0.0	0.00000	0.00000
TOTAL TRANS	29.5	0.0	0.9	30.4	1.03000	0.97087
PRIM SUBS	49.4	0.0	1.8	51.2	1.03724	0.96410
PRIM LINES	90.7	0.0	5.1	95.8	1.05618	0.94681
SECONDARY	1,543.1	0.0	124.2	1,667.3	1.08050	0.92550
			132.0			
TOTALS	1,712.7	0.0	132.0	1,844.7		

DEVELOPMENT of LOSS FACTORS
ADJUSTED
ENERGY

LOSS FACTOR LEVEL	CUSTOMER SALES MWH a	SALES ADJUST b	CALC LOSS TO LEVEL c	SALES MWH @ GEN d	CUM ANNUAL EXPANSION FACTORS e	f=1/e
BULK LINES	0	0	0	0	0.00000	0.00000
TRANS SUBS	0	0	0	0	0.00000	0.00000
TRANS LINES	0	0	0	0	0.00000	0.00000
SUBTRANS SUBS	0	0	0	0	0.00000	0.00000
TOTAL TRANS	241,668	0	7,250	248,918	1.03000	0.97087
PRIM SUBS	311,633	0	12,092	323,725	1.03880	0.96265
PRIM LINES	612,042	0	30,761	642,803	1.05026	0.95215
SECONDARY	6,843,125	0	524,463	7,367,588	1.07664	0.92881
			574,566			
TOTALS	8,008,468	0	574,566	8,583,034		

ESTIMATED VALUES AT GENERATION

LOSS FACTOR AT VOLTAGE LEVEL	MW	MWH
BULK LINES	0.00	0
TRANS SUBS	0.00	0
TRANS LINES	0.00	0
SUBTRANS SUBS	0.00	0
SUBTRANS LINES	30.39	248,918
PRIM SUBS	51.24	323,725
PRIM LINES	95.80	642,803
SECONDARY	1,667.28	7,367,588
	1,844.70	8,583,034
ACTUAL ENERGY	1,844.70	8,583,034
MISMATCH	0.00	0
% MISMATCH	0.00%	0.00%

Adjusted Losses and Loss Factors by Facility EXHIBIT 8

Unadjusted Losses by Segment

	MW	Unadjusted	MWH	Unadjusted
Service Drop Losses	5.19	5.17	18,254	18,244
Secondary Losses	4.02	4.01	7,528	7,524
Line Transformer Losses	22.36	22.28	143,111	143,036
Primary Line Losses	27.08	26.98	82,656	82,613
Distribution Substation Losses	10.93	10.89	67,363	67,327
Transmission System Losses	53.73	53.73	249,991	249,991
Total	123.31	123.04	568,903	568,736

Mismatch Allocation by Segment

	MW	MWH
Service Drop Losses	-0.67	-334
Secondary Losses	-0.52	-138
Line Transformer Losses	-2.89	-2,616
Primary Line Losses	-3.50	-1,511
Distribution Substation Losses	-1.41	-1,232
Transmission System Losses	0.00	0
Total	-8.99	-5,830

Adjusted Losses by Segment

	MW	% of Total	MWH	% of Total
Service Drop Losses	5.84	4.4%	18,578	3.2%
Secondary Losses	4.53	3.4%	7,662	1.3%
Line Transformer Losses	25.17	19.1%	145,652	25.3%
Primary Line Losses	30.48	23.1%	84,124	14.6%
Distribution Substation Losses	12.30	9.3%	68,559	11.9%
Transmission System Losses	53.73	40.7%	249,991	43.5%
Total	132.04	100.0%	574,566	100.0%

Loss Factors by Segment	**MW**	**MWH**	
Retail Sales from Service Drops	1,543.064	6,843,125	
Adjusted Service Drop Losses	5.836	18,578	
Input to Service Drops	1,548.899	6,861,703	
Service Drop Loss Factor	**1.00378**	**1.00271**	
Output from Secondary	1,548.899	6,861,703	
Adjusted Secondary Losses	4.529	7,662	
Input to Secondary	1,553.429	6,869,365	
Secondary Conductor Loss Factor	**1.00292**	**1.00112**	
Output from Line Transformers	1,553.429	6,869,365	
Adjusted Line Transformer Losses	25.169	145,652	
Input to Line Transformers	1,578.598	7,015,017	
Line Transformer Loss Factor	**1.01620**	**1.02120**	
Retail Sales from Primary	84.000	583,501	
Req. Whls Sales from Primary	6.700	28,541	
Input to Line Transformers	1,578.598	7,015,017	
Output from Primary Lines	1,669.298	7,627,059	
Adjusted Primary Line Losses	30.476	84,124	
Input to Primary Lines	1,699.773	7,711,183	
Primary Line Loss Factor	**1.01826**	**1.01103**	
Output PI from Distribution Substations	1,699.773	7,711,183	
Req. Whls Sales from Substations	0.000	0	
Retail Sales from Substations	49.400	311,633	
TotalOutput from Distribution Substations	1,749.173	8,022,816	
Adjusted Distribution Substation Losses	12.298	68,559	
Input to Distribution Substations	1,761.471	8,091,375	
Distribution Substation Loss Factor	**1.00703**	**1.00855**	
Retail Sales at from SubTransmission	29.500	241,668	
Req. Whls Sales from SubTransmission	0.000	0	
Non-Req. Whls Sales from SubTransmission	0.000	0	
Losses	0.000	0	4678
Input to Distribution Substations	1,761.471	8,091,375	
Output from SubTransmission	1,790.971	8,333,043	1,844.700
SubTransmission System Losses	53.729	249,991	53.729
Input to Transmission	1,844.700	8,583,034	53.729
TotTransmission System Loss Factor	**1.03000**	**1.03000**	53.729

DEMAND MW **SUMMARY OF LOSSES AND LOSS FACTORS BY DELIVERY VOLTAGE** **EXHIBIT 9**

	SERVICE LEVEL		SALES MW	LOSSES	SECONDARY	PRIMARY	SUBSTATION	SUBTRANS	TRANSMISSION
1	**SERVICES**								
2	SALES		1,543.1		1,543.1				
3	LOSSES			5.8	5.8				
4	INPUT				1,548.9				
5	**EXPANSION FACTOR**	**1.00378**							
6	**SECONDARY**								
7	SALES								
8	LOSSES			4.5	4.5				
9	INPUT				1,553.4				
10	**EXPANSION FACTOR**	**1.00292**							
11	**LINE TRANSFORMER**								
12	SALES								
13	LOSSES			25.2	25.2				
14	INPUT				1,578.6				
15	**EXPANSION FACTOR**	**1.01620**							
16	**PRIMARY**								
17	SECONDARY				1,578.6				
18	SALES		84.0			84.0			
19	LOSSES			30.5	28.8	1.5			
20	INPUT				1,607.4	85.5			
21	**EXPANSION FACTOR**	**1.01826**							
22	**SUBSTATION**								
23	PRIMARY				1,607.4	85.5			
24	SALES		49.4				49.4		
25	LOSSES			12.3	11.3	0.6	0.3		
26	INPUT				1,618.7	86.1	49.7		
27	**EXPANSION FACTOR**	**1.00703**							
28	**SUB-TRANSMISSION**								
29	DISTRIBUTION SUBS								
30	SALES								
31	LOSSES								
32	INPUT								
33	**EXPANSION FACTOR**								
34	**TRANSMISSION**								
35	SUBTRANSMISSION								
36	DISTRIBUTION SUBS				1,618.7	86.1	49.7		
37	SALES		29.5						29.5
38	LOSSES			53.5	48.6	2.6	1.5		0.9
39	INPUT				1,667.3	88.7	51.2		30.4
40	**EXPANSION FACTOR**	**1.03000**							
41	**TOTALS** LOSSES			131.8	124.2	4.7	1.8		0.9
42	% OF TOTAL			100%	94.22%	3.58%	1.40%		0.67%
43	SALES		1,706.0		1,543.1	84.0	49.4		29.5
44	% OF TOTAL		100.00%		90.45%	4.92%	2.90%		1.73%
45	INPUT		1,837.6		1,667.3	88.7	51.2		30.4
46	**CUMMULATIVE EXPANSION LOSS FACTORS** (from meter to system input)				**1.08050**	**1.05618**	**1.03724**		**1.03000**

ENERGY MWH **SUMMARY OF LOSSES AND LOSS FACTORS BY DELIVERY VOLTAGE** **EXHIBIT 9**

	SERVICE LEVEL		SALES	LOSSES	SECONDARY	PRIMARY	SUBSTATION	SUBTRANS	TRANSMISSION
1	**SERVICES**								
2	SALES		6,843,125		6,843,125				
3	LOSSES			18,578	18,578				
4	INPUT				6,861,703				
5	**EXPANSION FACTOR**	**1.00271**							
6	**SECONDARY**								
7	SALES								
8	LOSSES			7,662	7,662				
9	INPUT				6,869,365				
10	**EXPANSION FACTOR**	**1.00112**							
11	**LINE TRANSFORMER**								
12	SALES								
13	LOSSES			145,652	145,652				
14	INPUT				7,015,017				
15	**EXPANSION FACTOR**	**1.02120**							
16	**PRIMARY**								
17	SECONDARY				7,015,017				
18	SALES		583,501.000			583,501			
19	LOSSES			84,124	77,373	6,436			
20	INPUT				7,092,390	589,937			
21	**EXPANSION FACTOR**	**1.01103**							
22	**SUBSTATION**								
23	PRIMARY				7,092,390	589,937			
24	SALES		311,633				311,633		
25	LOSSES			68,559	60,608	5,041	2,663		
26	INPUT				7,152,998	594,978	314,296		
27	**EXPANSION FACTOR**	**1.00855**							
28	**SUB-TRANSMISSION**								
29	DISTRIBUTION SUBS								
30	SALES								
31	LOSSES								
32	INPUT								
33	**EXPANSION FACTOR**								
34	**TRANSMISSION**								
35	SUBTRANSMISSION								
36	DISTRIBUTION SUBS				7,152,998	594,978	314,296		
37	SALES		241,668						241,668
38	LOSSES			249,118	214,590	17,849	9,429		7,250
39	INPUT				7,367,588	612,827	323,725		248,918
40	**EXPANSION FACTOR**	**1.03000**							
41	**TOTALS** LOSSES			573,693	524,463	29,326	12,092		7,250
42	% OF TOTAL			100%	91.42%	5.11%	2.11%		1.26%
43	SALES		7,979,927		6,843,125	583,501	311,633		241,668
44	% OF TOTAL		100.00%		85.75%	7.31%	3.91%		3.03%
45	INPUT		8,553,059		7,367,588	612,827	323,725		248,918
46	**CUMMULATIVE EXPANSION LOSS FACTORS** (from meter to system input)				**1.07664**	**1.05026**	**1.03880**		**1.03000**

Appendix D

Discussion of Hoebel Coefficient

Evergy
2020 Analysis of System Losses

COMMENTS ON THE HOEBEL COEFFICIENT

The Hoebel coefficient represents an established industry standard relationship between peak losses and average losses and is used in a loss study to estimate energy losses from peak demand losses. H. F. Hoebel described this relationship in his article, "Cost of Electric Distribution Losses," Electric Light and Power, March 15, 1959. A copy of this article is attached.

Within any loss evaluation study, peak demand losses can readily be calculated given equipment resistance and approximate loading. Energy losses, however, are much more difficult to determine given their time-varying nature. This difficulty can be reduced by the use of an equation which relates peak load losses (demand) to average losses (energy). Once the relationship between peak and average losses is known, average losses can be estimated from the known peak load losses.

Within the electric utility industry, the relationship between peak and average losses is known as the loss factor. For definitional purposes, loss factor is the ratio of the average power loss to the peak load power loss, during a specified period of time. This relationship is expressed mathematically as follows:

$$(1)\quad F_{LS} \cong A_{LS} \div P_{LS}$$

where: F_{LS} = Loss Factor
A_{LS} = Average Losses
P_{LS} = Peak Losses

The loss factor provides an estimate of the degree to which the load loss is maintained throughout the period in which the loss is being considered. In other words, loss factor is the ratio of the actual kWh losses incurred to the kWh losses which would have occurred if full load had continued throughout the period under study.

Examining the loss factor expression in light of a similar expression for load factor indicates a high degree of similarity. The mathematical expression for load factor is as follows:

$$(2)\quad F_{LD} \cong A_{LD} \div P_{LD}$$

where: F_{LD} = Load Factor
A_{LD} = Average Load
P_{LD} = Peak Load

This load factor result provides an estimate of the degree to which the load loss is maintained throughout the period in which the load is being considered. Because of the similarities in definition, the loss factor is sometimes called the "load factor of losses." While the definitions are similar, a strict equating of the two factors cannot be made. There does exist, however, a relationship between these two factors which is dependent upon the shape of the load duration curve. Since resistive losses vary as the square of the load, it can be shown mathematically that the loss factor can vary between the extreme limits of load factor and load factor squared. The

relationship between load factor and loss factor has become an industry standard and is as follows:

$$(3)\ F_{LS} \cong H*F_{LD}^2 + (1-H)*F_{LD}$$

where: F_{LS} = Loss Factor
F_{LD} = Load Factor
H = Hoebel Coefficient

As noted in the attached article, the suggested value for H (the Hoebel coefficient) is 0.7. The exact value of H will vary as a function of the shape of the utility's load duration curve. In recent years, values of H have been computed directly for a number of utilities based on EEI load data. It appears on this basis, the suggested value of 0.7 should be considered a lower bound and that values approaching unity may be considered a reasonable upper bound. Based on experience, values of H have ranged from approximately 0.85 to 0.95. The standard default value of 0.9 is generally used.

Inserting the Hoebel coefficient estimate gives the following loss factor relationship using Equation (3):

$$(4)\ F_{LS} \cong 0.90*F_{LD}^2 + 0.10*F_{LD}$$

Once the Hoebel constant has been estimated and the load factor and peak losses associated with a piece of equipment have been estimated, one can calculate the average, or energy losses as follows:

$$(5)\ A_{LS} \cong P_{LS} * [H*F_{LD}^2 + (1-H)*F_{LD}]$$

where: A_{LS} = Average Losses
P_{LS} = Peak Losses
H = Hoebel Coefficient
F_{LD} = Load Factor

Loss studies use this equation to calculate energy losses at each major voltage level in the analysis.