AUSTIN ENERGY'S 2022 BASE RATE REVIEW	§ § §	**BEFORE THE CITY OF AUSTIN** **IMPARTIAL HEARING EXAMINER**

AUSTIN ENERGY'S RESPONSE TO TEXAS INDUSTRIAL ENERGY CONSUMERS' FIRST REQUEST FOR INFORMATION

Austin Energy files this Response to the Texas Industrial Energy Consumers' ("TIEC") First Request for Information ("RFI") submitted on May 16, 2022.[1] Pursuant to the 2022 Austin Energy Base Rate Review Procedural Guidelines § F(2)(f)(1), this Response is timely filed.

Respectfully submitted,

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ATTORNEYS FOR THE CITY OF AUSTIN D/B/A AUSTIN ENERGY

[1] TIEC's First Request for Information was submitted to the Rate Review Administrator after 12:00 pm on May 13, 2022, so it is considered submitted the following business day, on May 16, 2022.

TIEC 1-1: Referring to WP F-6.1, provide the workpapers showing the corresponding coincident and non-coincident peak demands at the meter and showing the application of the loss factors to restate the metered amounts to the generation level.

ANSWER: Austin Energy has not prepared workpapers calculating the coincident and non-coincident peak demands at the meter. The coincident and non-coincident peak demand values shown in WP F-6.1 are stated at the generation level, before line losses.

Coincident and Non-Coincident peak demands at-meter can be calculated using the values in WP F-6.1 and WP 6.1.2 to the cost study. For example, one could derive the Residential Class October 2020 peak demand at the meter coincident with Austin Energy's peak, by using the following formula:

a – (a * b) = c
1123748 – (1123748 * 0.0514) = c
1123748 – 57806
1065942 = c
Where:
a = WP F-6.1, line 2, column A: 1,123,748
b = WP F-6.1.2, line 16, column C: 5.14%
c = at-meter statistic

Prepared by: JL

Sponsored by: Brian Murphy

TIEC 1-2: Provide all workpapers to the System Loss Study provided in Appendix D of the Rate Filing Package in "live" EXCEL format.

ANSWER: See attachments.

Attachment TIEC 1-2a: TIEC_1_2a_2019_Loss_Study_Final.xlsx

Attachment TIEC 1-2b:
TIEC_1_2b_Austin_Energy_Loss_Study_2019_Nov6_R1.docx

Attachment TIEC 1-2c:
TIEC_1_2c_18SSWG_2019_SUM1_Final_06252018_Scale_AE_Load_to_2878_Correct_R.csv

Prepared by: EM

Sponsored by: Thomas Pierpoint

Exhibit A
System Loss Summary

AUSTIN ENERGY

Evaluation of T&D System Losses

Summary of T&D System Losses

SYSTEM LOSSES

	Austin Energy
2018 Annual Net Available for Sale (MWh)	13,950,713
2018 Annual Energy Sales (MWh)	13,338,963
ANNUAL SYSTEM LOSSES (MWh)	**611,750**
PERCENT SYSTEM LOSSES	**4.39%**

TYPE	ANNUAL ENERGY LOSSES (MWh)(2)	PERCENT OF AE ENERGY AVAILABLE	PERCENT OF TOTAL AE LOSSES	DEMAND LOSSES AT PEAK (MW)	PERCENT OF DEMAND AE LOSSES AT PEAK
Voltage Level: Transmission 345 kV	18,183	**0.13%**	2.97%	6.37	4.17%
Transmission Line Losses	18,183	**0.13%**	2.97%	6.37	4.17%
Transmission Substation Transformer Losses					
Core	0	**0.00%**	0.00%	0.00	0.00%
Winding	0	**0.00%**	0.00%	0.00	0.00%
Voltage Level: Transmission 138 kV	143,383	**1.03%**	23.44%	46.70	30.61%
Transmission Line Losses	117,828	**0.84%**	19.26%	41.26	27.05%
Transmission Substation Transformer Losses					
Core	14,863	**0.11%**	2.43%	1.70	1.11%
Winding	10,692	**0.08%**	1.75%	3.74	2.45%
Voltage Level: Transmission 69 kV	5,710	**0.04%**	0.93%	1.59	1.04%
Transmission Line Losses	3,425	**0.02%**	0.56%	1.20	0.79%
Transmission Substation Transformer Losses					
Core	1,743	**0.01%**	0.28%	0.20	0.13%
Winding	541	**0.00%**	0.09%	0.19	0.12%
Voltage Level: Distribution	164,047	**1.18%**	26.82%	51.53	33.78%
Distribution Line Losses	107,401	**0.77%**	17.56%	37.61	24.65%
Distribution Substation Transformer Losses					
Core	25,076	**0.18%**	4.10%	2.86	1.88%
Winding	31,570	**0.23%**	5.16%	11.06	7.25%
Voltage Level: Secondary	259,656	**1.86%**	42.44%	46.37	30.39%
Distribution Transformer Losses					
Core	178,834	**1.28%**	29.23%	20.41	13.38%
Winding	26,261	**0.19%**	4.29%	9.20	6.03%
Service and Secondary Line Losses	47,842	**0.34%**	7.82%	16.76	10.98%
Street & Security Lights(1)(3)	6,718	**0.05%**	1.10%	0.00	0.00%
Loose Hardware, Corona or Other Mechanical Abnormalities and Metering Inaccuracies	20,771	**0.15%**	3.40%	0.00	0.00%
TOTALS	611,750	**4.39%**	100.00%	152.56	100.00%

Notes:

(1) Street and Security Light losses are the difference in billed kWh and total kWh for all lights

(2) Annual Energy Losses were determined using the following equations:

Annual Energy Losses = Peak Demand (kW) * Time (hrs) * Loss Factor

Loss Factor = k * Load Factor + (1 - k) * (Load Factor)^2

"k" constant	0.08
Load Factor	55.34%

(3) Street and Security Light were off at the recorded peak

(4) GSU's results are categorized by the high side voltage, all other transformer results are categorized by low side voltage

Exhibit B
Transmission Line Losses

AUSTIN ENERGY
Evaluation of T&D System Losses

Estimated Transmission Line Losses

TRANSMISSION VOLTAGE (kV)	MILES OF LINE (1)	DEMAND LOSSES AT 2018 PEAK (MW)(2)	ANNUAL ENERGY LOSSES (MWh)
69	26.1	1,200	3,425,488
138	321.5	41,263	117,827,671
345	276.2	6,368	18,182,883
TOTALS	623.8	48,831	139,436,042

Notes:
(1) Transmission line length from AE Transmission Line Database
(2) Peak losses extracted from PSS/E system model

AUSTIN ENERGY

Evaluation of T&D System Losses

Estimated Transmission Line Losses

Exhibit C
Transmission Transformer Losses

AUSTIN ENERGY
Evaluation of T&D System Losses

Estimated Transmission Substation Transformer Losses

SUBSTATION NAME	TRANSFORMER VOTLAGE	TRANSFORMER BASE RATING (MVA)	TRANSFORMER NO-LOAD LOSSES (kW) (1)	ANNUAL (2) NO-LOAD ENERGY LOSSES (kWh)	TRANSFORMER LOAD LOSSES (kW) (3)	ANNUAL (4) LOAD ENERGY LOSSES (kWh)
NL AT1	138/69 kV	220	35.6	311,462	33.72	96,282
KB AT1	138/69 kV	220	51.8	453,768	80.95	231,144
MC-AT1 (McNeil)	138/69 kV	220	61.6	539,861	41.38	118,149
PE-AT1	138/69 kV	220	50.0	437,912	33.59	95,908
DL AT1	345/138 kV	672	146.7	1,285,092	390.11	1,113,958
GF AT1	345/138 kV	480	90.0	788,400	165.56	472,757
GF AT2	345/138 kV	480	91.7	803,292	196.67	561,595
LY AT1	345/138 kV	480	124.9	1,093,861	176.09	502,831
LY AT2	345/138 kV	480	98.1	859,356	333.57	952,519
AU AT1	345/138 kV	480	118.0	1,033,855	153.15	437,309
AU AT2	345/138 kV	480	121.2	1,061,975	133.08	380,016
DP MT1	22.8/138 kV	420	219.5	1,922,470	545.17	1,556,721
DP MT2	22.8/138 kV	470	232.6	2,037,313	784.52	2,240,188
DP MPT1 (5)	13.8/138 kV	139	51.0	446,760	0.49	1,408
DP MPT2 (5)	13.8/138 kV	139	51.0	446,760	65.09	185,850
SH GSU1 (6)	13.8/138 kV	130	52.0	455,520	280.59	801,229
SH GSU2 (7)	13.8/138 kV	130	50.0	438,000	93.98	268,349
SH GSU3 (8)	13.8/138 kV	150	50.8	445,008	278.58	795,481
SH MPT5 (9)	18.0/138 kV	480	199.2	1,744,992	147.81	422,072
345 kV TOTALS		0	0.0	0	0	0
138 kV TOTALS (10)		5,610	1,697	14,862,654	3,744	10,692,283
69 kV TOTALS (10)		880	199.0	1,743,003	190	541,483
TOTALS		6,490	1,895.6	16,605,657	3,934	11,233,766

Notes:
(1) From Austin Energy test reports
(2) Annual No-Load Energy Losses is based on calculated demand losses times 8760 hours.
(3) Calculated in PSS/E model with 2018 peak load flows
(4) Annual Load Energy Losses is based on transformer load losses, 8760 hours, and a loss factor calculated from the annual load factor
(5) No-Load Demand Losses are estimated to be the same as Sandhill Transformers of similar size
(6) Losses for SANDH_G1 and SANDH_G2
(7) Losses for SANDH_G3 and SANDH_G4
(8) Losses for SANDH_G6 and SANDH_G7
(9) Losses for SANDHG5A and SANDHG5C
(10) GSU's results are categorized by the high side voltage, all other transformer results are categorized by low side voltage

1. Update R of several branches

	R	Loss	MVA	New R
1013	0.00289	2.81520	308.00	0.00320
974	0.00274	2.79247	314.90	**0.00312**
961	0.00222	1.22384	231.00	**0.00263**
906	0.00051	0.39272	276.60	0.000540

2. Simlified the distribution transformer loss calculation besed on test report.

3. correct S light calculation

Exhibit D
Substation Transformer Losses

AUSTIN ENERGY
Evaluation of T&D System Losses

Estimated Distribution Substation Transformer Losses

SUBSTATION NAME	TRANSFORMER BASE RATING (MVA)	2018 COINCIDENT PEAK LOAD (kW)	TRANSFORMER NO-LOAD LOSSES (kW) (1)(7)	ANNUAL (2) NO-LOAD ENERGY LOSSES (kWh)	TRANSFORMER LOAD LOSSES (kW) (3)	ANNUAL (4) LOAD ENERGY LOSSES (kWh)	
AD123	30	11,052	16.8	147,168	25.2	72,019	
AD456	30	13,802	16.8	147,076	40.0	114,354	
AG123	30	14,251	14.8	130,060	25.7	73,248	
AG456	30	22,130	14.7	128,588	102.4	292,362	
BAL TX1(5)(6)	25	17	14.7	128,772	14.1	40,147	no FL & NL data
BAL TX2(5)(6)	25	9,623	14.7	128,772	14.1	40,147	no FL & NL data
BA012	30	19,789	13.6	119,206	91.0	259,741	
BA123	30	15,117	9.9	86,461	57.9	165,235	
BA456	30	18,464	34.2	299,855	81.8	233,596	
BA789	30	11,645	16.2	141,557	25.2	71,869	
BC123	30	11,365	27.6	241,999	40.8	116,363	
BC456	30	11,365	19.9	174,210	24.4	69,680	
BC789	30	13,323	12.9	113,319	39.1	111,656	
BE123	30	10,341	14.5	127,024	19.0	54,209	
BE456	30	12,767	11.2	98,051	38.4	109,617	
BL123	30	26,539	14.6	127,852	148.5	424,107	
BL456	30	16,673	17.1	149,927	51.4	146,886	
BL789	30	23,995	13.3	116,079	126.7	361,832	
BR123	70	19,298	52.1	456,221	35.8	102,181	
BR456	70	18,465	53.3	466,523	59.6	170,272	
BR789	70	19,588	27.8	243,747	29.6	84,551	
BU123	30	22,293	14.0	123,069	117.0	334,128	
BU456	30	15,192	13.8	121,046	51.0	145,506	
BU789	30	25,725	30.5	266,742	313.2	894,447	
BW123	50	2,329	21.6	189,479	0.5	1,529	
BW456	50	1,166	22.2	194,078	0.1	300	
CC123	30	22,405	15.1	132,451	101.4	289,424	
CC456	30	8,256	10.6	92,716	16.7	47,733	
CC789	30	5,716	12.9	113,227	5.5	15,741	
CA123	30	19,178	13.7	120,402	74.8	213,477	
CA456	30	24,965	13.6	119,390	127.9	365,130	
CF123	30	20,310	16.6	145,788	86.2	246,099	
CF456	30	22,232	12.6	110,376	101.2	289,034	
CF789	30	15,561	13.4	117,275	52.7	150,454	
CL012	30	20,203	14.3	125,277	49.2	140,529	
CL123	30	20,490	15.0	131,163	52.9	151,023	
CL456	30	25,077	14.6	127,852	130.1	371,457	
CL789	30	15,582	14.2	124,633	31.7	90,578	
CM123	30	17,541	9.7	84,990	72.7	207,511	
CM456	30	6,113	11.0	96,487	8.5	24,196	
CM789	30	18,263	13.9	121,874	70.2	200,465	
CM101112	30	7,822	14.4	126,564	7.8	22,307	
DE123	30	9,870	14.3	125,001	28.9	82,603	
DE456	50	24,045	19.4	170,163	78.1	223,102	
DE789	50	24,144	19.5	170,991	62.4	178,278	
DE101112	50	17,554	20.5	180,005	23.6	67,371	
DE131415	50	17,504	19.9	174,302	32.8	93,756	
DE161718	67	22,572	27.2	237,860	29.7	84,701	
DE192021	67	22,503	26.8	235,009	33.6	95,885	
DE222324	30	26,627	15.1	132,175	101.0	288,494	
DE2526	30	15,176	15.1	132,175	31.7	90,398	
DG123	30	9,219	15.0	130,980	10.7	30,672	
DG456	30	17,420	14.1	123,621	64.3	183,615	
DL123	30	10,896	18.8	164,552	22.9	65,332	
EB012	50	4,861	21.7	190,215	6.0	17,180	
EB123	50	(41)	24.2	211,922	0.0	0	
EB456	50	4,788	23.1	202,356	6.0	17,240	
EB789	50	24,792	23.1	202,356	139.9	399,401	
ER123	30	1,924	12.8	111,940	0.5	1,379	
FI123	30	22,435	13.5	118,286	99.7	284,717	
FI456	30	15,751	14.6	127,852	50.7	144,877	
FV123	30	20,374	14.9	130,244	77.4	221,003	
FV456	30	18,802	18.9	165,288	61.3	174,920	

Exhibit D
Substation Transformer Losses

AUSTIN ENERGY
Evaluation of T&D System Losses

Estimated Distribution Substation Transformer Losses

SUBSTATION NAME	TRANSFORMER BASE RATING (MVA)	2018 COINCIDENT PEAK LOAD (kW)	TRANSFORMER NO-LOAD LOSSES (kW) (1)(7)	ANNUAL (2) NO-LOAD ENERGY LOSSES (kWh)	TRANSFORMER LOAD LOSSES (kW) (3)	ANNUAL (4) LOAD ENERGY LOSSES (kWh)	
GR123	30	5,074	16.0	139,994	3.6	10,164	
GR456	30	3,757	13.1	114,791	2.8	7,945	
GR789	30	25,891	37.9	332,048	154.0	439,758	
HC012	30	25,453	12.7	111,572	151.9	433,761	
HC123	30	28,272	34.1	298,567	207.2	591,680	
HC456	30	23,745	30.2	264,902	124.7	356,046	
HC789	30	25,512	12.1	105,777	145.9	416,611	
HL123	30	21,273	16.9	147,904	86.1	245,859	
HL456	30	24,687	14.9	130,612	127.1	363,002	
HM012	30	17,031	14.4	126,105	29.9	85,511	
HM123	30	18,561	30.4	266,006	71.7	204,722	
HM456	30	23,350	26.8	234,825	170.9	488,090	
HM789	30	14,621	14.0	122,241	41.2	117,652	
HV123	30	21,757	13.7	120,402	107.7	307,533	
HV456	30	27,606	9.6	83,794	169.2	483,233	
JE123	30	21,825	30.1	263,983	122.6	350,169	
JE456	30	16,779	14.0	122,885	54.4	155,281	
JV123	30	25,822	16.0	140,361	142.2	405,997	
JV456	30	17,939	9.9	86,369	75.1	214,317	
JV789	30	18,370	13.7	119,942	74.4	212,308	
JL123	30	17,607	17.7	155,354	42.3	120,831	
JL456	30	6,416	17.9	156,550	5.3	14,991	
KB123	30	16,478	17.4	152,227	54.7	156,210	
KB456	30	22,108	14.5	126,932	106.3	303,576	
KL1234	30	18,650	18.2	159,217	56.6	161,517	
KL5678	30	19,591	18.3	160,413	53.4	152,552	
LS123	30	19,144	14.8	129,692	82.5	235,485	
LS456	30	15,580	15.8	137,970	56.9	162,387	
LW123	30	18,877	16.0	140,361	64.9	185,384	
LW456	30	23,266	9.9	86,553	126.6	361,413	
MC012	30	8,198	14.2	124,633	14.6	41,646	
MC123	30	15,980	13.0	113,779	34.9	99,633	
MC456	30	17,664	30.2	264,443	75.9	216,596	
MC789	30	15,166	16.4	143,765	49.8	142,238	
MP123	30	18,724	15.8	137,970	80.0	228,319	
MP456	30	20,944	13.7	119,574	93.7	267,626	
MP789	30	17,533	12.0	105,409	55.0	157,170	
MT123	30	7,625	16.8	147,076	11.8	33,641	
MT012	30	10,648	11.5	100,350	24.1	68,930	
MU123	30	7,980	15.1	132,359	8.0	22,877	
MU456	30	8,494	13.0	113,503	9.6	27,344	
NL012	30	19,464	11.9	103,937	70.1	200,255	
NL123	20	9,673	16.7	145,880	28.6	81,553	
NL345	30	24,123	10.4	90,784	125.6	358,714	
NL789	20	6,024	17.1	149,559	25.5	72,918	
NW123	30	22,569	14.9	130,152	114.4	326,692	
NW456	30	4,223	17.6	153,975	3.4	9,744	
OC123	30	4,396	13.7	119,666	4.3	12,263	
OC456	30	0	12.1	106,329	0.0	0	Unit to be relocated to Sand Hill (SH-456)
OH123	30	15,116	12.7	111,296	54.6	155,821	
OH456	30	19,059	12.4	108,536	83.2	237,614	
OH789	30	21,594	14.1	123,621	101.0	288,344	
PE1234	30	23,433	14.7	129,048	124.8	356,345	
PE5678	30	25,747	14.7	129,048	152.7	436,130	
PL123	30	26,716	14.8	129,416	135.0	385,519	
PL789	50	20,161	21.9	192,238	59.5	169,763	
PL101112	30	21,491	17.0	149,008	83.2	237,584	
PL131415	30	4,250	14.8	129,600	2.3	6,446	
RP123	20	396	15.6	136,498	0.1	240	
RP789	30	17,417	15.5	136,038	38.2	108,957	
SK123	30	9,236	30.0	262,971	20.9	59,576	
SK456	30	23,276	13.3	116,079	122.1	348,610	
SL123	30	25,975	15.1	131,991	132.8	379,192	

Exhibit D
Substation Transformer Losses

AUSTIN ENERGY

Evaluation of T&D System Losses

Estimated Distribution Substation Transformer Losses

SUBSTATION NAME	TRANSFORMER BASE RATING (MVA)	2018 COINCIDENT PEAK LOAD (kW)	TRANSFORMER NO-LOAD LOSSES (kW) (1)(7)	ANNUAL (2) NO-LOAD ENERGY LOSSES (kWh)	TRANSFORMER LOAD LOSSES (kW) (3)	ANNUAL (4) LOAD ENERGY LOSSES (kWh)
SL456	30	24,754	29.9	261,683	153.6	438,498
SL789	30	23,484	15.5	136,038	115.6	330,200
SP123	30	18,073	13.8	121,138	46.2	131,984
SP789	30	21,930	14.1	123,529	113.3	323,424
SP012	30	22,445	14.6	127,760	113.6	324,264
SP345	70	28,121	21.1	184,512	77.8	222,292
SP678	70	28,004	21.0	183,960	65.8	187,932
SN-NT1	50	0	15.8	137,970	0.0	0
SN-NT2	50	23,056	15.8	137,970	50.2	143,288
SR123	30	17,538	13.1	114,791	44.0	125,658
ST123	30	16,411	15.0	130,980	50.8	145,147
ST456	30	12,624	11.0	96,211	29.0	82,842
ST789	30	18,677	15.5	135,487	78.7	224,841
SU123	30	20,083	12.2	106,881	84.7	241,751
SU456	30	19,448	12.7	110,836	77.1	220,044
SU789	30	9,652	14.7	128,956	12.7	36,279
SU012	30	7,853	15.4	135,119	7.7	22,127
SU345	30	23,868	13.8	120,770	126.8	362,042
SW123	30	24,113	16.8	147,168	115.4	329,571
SW456	30	23,448	18.2	159,125	105.1	299,978
SW789	30	21,416	13.2	115,895	95.1	271,464
TP123	30	20,630	10.4	91,060	86.7	247,628
TP456	30	17,075	11.3	98,879	61.5	175,489
TP789	30	20,066	16.6	145,604	78.4	224,001
TR123	30	25,964	13.7	120,310	185.1	528,477
TR456	30	11,468	14.1	123,621	32.3	92,197
TR789	30	19,891	13.5	118,654	90.7	258,991
VE123	50	0	16.2	142,201	0.0	0
WA123	30	16,702	26.9	235,653	88.5	252,845
WA456	30	7,675	26.8	234,457	17.9	50,971
WA789	30	6,974	16.9	147,812	9.7	27,704
WB123	50	3,233	15.7	137,878	0.8	2,369
WB456	50	3,221	22.0	192,698	0.9	2,429
WC012	30	15,324	12.2	107,065	46.5	132,734
WC789	30	14,429	10.3	90,600	58.5	166,944
WI012	30	14,869	12.1	105,593	41.1	117,233
WI123	40	22,578	14.3	125,093	106.0	302,586
WI456	40	28,787	16.2	141,833	164.3	469,051
WI789	30	17,333	16.2	141,833	57.5	164,186
WL123	30	13,387	22.7	198,677	39.9	113,935
WL456	30	23,343	13.4	117,366	73.2	208,890
WL789	30	18,502	13.8	120,494	78.9	225,381
TOTALS	5,613	2,792,030	2,862.5	25,075,680	11,055.8	31,570,019

NXP load served by PL789

Notes:
(1) From Austin Energy test reports
(2) Annual No-Load Energy Losses is based on calculated demand losses times 8760 hours.
(3) Calculated in Feederall model with 2018 peak load flows
(4) Annual Load Energy Losses is based on transformer load losses, 8760 hours, and a loss factor calculated from the annual load factor
(5) No-Load Loss values were estimated based on the average No-Load Loss of th 30 MVA Transformers
(6) Load Loss values were estimated based on 30 MVA Transformers of simlar loading
(7) Units with no No-Load Losses are de-energized or out of service

Exhibit E
Distribution Line Losses

AUSTIN ENERGY

Evaluation of T&D System Losses

Estimated Primary Distribution Line Losses

DISTRIBUTION VOLTAGE (kV)	LENGTH OF LINE (Miles)	DEMAND LOSSES (1) AT 2018 PEAK (kW)	ANNUAL ENERGY LOSSES (kWh)
12.5	5,803.0	37,612.1	107,401,352
TOTALS	5,803.0	37,612.1	107,401,352

Notes:
(1) Peak losses extracted from Feederall model

Exhibit F
Distribution Transformer Losses

AUSTIN ENERGY

Evaluation of T&D System Losses

Estimated Distribution Transformer Losses

LOCATION	TOTAL NO-LOAD LOSSES (kW)	TOTAL LOAD LOSSES (kW)	NUMBER OF XFMRS	TOTAL XFMR kVA	TOTAL ANNUAL ENERGY NO-LOAD LOSS (kWh)	TOTAL ANNUAL ENERGY LOAD LOSS (kWh)
Distribution Transformers	20,415	9,197	84,377	7,485,681	178,834,475	26,260,895
TOTALS	20,415	9,197	84,377	7,485,681	178,834,475	26,260,895

Notes:
(1) Losses were estimated for each distribution transformer size based on the manufacturer test reports for similar sized transformers
(2) Transformer loading based on customer sales and total transformer capacity
(3) Results excludes primary metered transformers
(4) Calculated Transformer Loading Percentage 36.62%

Exhibit G
Distribution Transformer Specifications

	Total Number of Transformers	Total Transformer kVA	Test Report No Load Loss
oh_xfmr_single_phase	43,761	2,080,840	4,372
ug_xfmr			16,043
1ph	35,404	2,393,629	
3ph	5,212	3,011,212	
TOTALS	84,377	7,485,681	20,415

Total Transformer kVA	7,485,681
Total Consumer Demand	2,741,490
Transformer Loading (%)	36.62%

Exhibit G
Distribution Transformer Specifications

Test Report Load Loss
2,374
6,822
9,197

PRIMARY VOLTAGE	KVA	MANUFACTURER	QTY	Test Report NLL (kW)	Test Report Total NLL (kW)
12.5	1.5	ABB	10	0.03150	0.3150395
12.5	1.5	CENTRAL MALONEY	1	0.03150	0.03150395
12.5	1.5	MIDCENTRAL	3	0.03150	0.09451185
12.5	1.5	UNKNOWN	2	0.03150	0.0630079
12.5	1.5	unset	3	0.03150	0.09451185
12.5	3	GENERAL ELECTRIC	3	0.03373	0.1011957
12.5	3	RTE	1	0.03373	0.0337319
12.5	3	UNKNOWN	9.0000	0.03373	0.3035871
12.5	5	GENERAL ELECTRIC	1	0.03670	0.0367025
12.5	5	L.M.	1	0.03670	0.0367025
12.5	5	UNKNOWN	10	0.03670	0.367025
12.5	5	WESTINGHOUSE	2	0.03670	0.073405
12.5	10	ABB	9	0.04413	0.397161
12.5	10	ALAMO	1	0.04413	0.044129
12.5	10	ALLIS CHALMERS	1	0.04413	0.044129
12.5	10	CENTRAL MALONEY	35	0.04413	1.544515
12.5	10	COOPER	428	0.04413	18.887212
12.5	10	EATON	10	0.04413	0.44129
12.5	10	ERMCO	151	0.04413	6.663479
12.5	10	GENERAL ELECTRIC	24	0.04413	1.059096
12.5	10	GREENVILLE	6	0.04413	0.264774
12.5	10	HEVI DUTY	1	0.04413	0.044129
12.5	10	HOWARD	474	0.04413	20.917146
12.5	10	KUHLMAN	3	0.04413	0.132387
12.5	10	L.M.	7	0.04413	0.308903
12.5	10	MCGRAW-EDISON	6	0.04413	0.264774
12.5	10	POWER PARTNERS/ABB	22	0.04413	0.970838
12.5	10	RTE	1	0.04413	0.044129
12.5	10	UNKNOWN	147	0.04413	6.486963
12.5	10	unset	12	0.04413	0.529548
12.5	10	WESTINGHOUSE	26	0.04413	1.147354
12.5	15	ABB	34	0.05156	1.752887
12.5	15	ALAMO	2	0.05156	0.103111
12.5	15	ALLIS CHALMERS	13	0.05156	0.6702215
12.5	15	CENTRAL MALONEY	13	0.05156	0.6702215
12.5	15	COOPER	63	0.05156	3.2479965
12.5	15	EATON	1	0.05156	0.0515555
12.5	15	ERMCO	1	0.05156	0.0515555
12.5	15	GENERAL ELECTRIC	58	0.05156	2.990219
12.5	15	HOWARD	139	0.05156	7.1662145
12.5	15	KEARNEY	25	0.05156	1.2888875
12.5	15	KUHLMAN	2	0.05156	0.103111
12.5	15	L.M.	24	0.05156	1.237332
12.5	15	MCGRAW-EDISON	73	0.05156	3.7635515
12.5	15	RTE	13	0.05156	0.6702215
12.5	15	UNKNOWN	918	0.05156	47.327949
12.5	15	unset	5	0.05156	0.2577775
12.5	15	WESTINGHOUSE	80	0.05156	4.12444

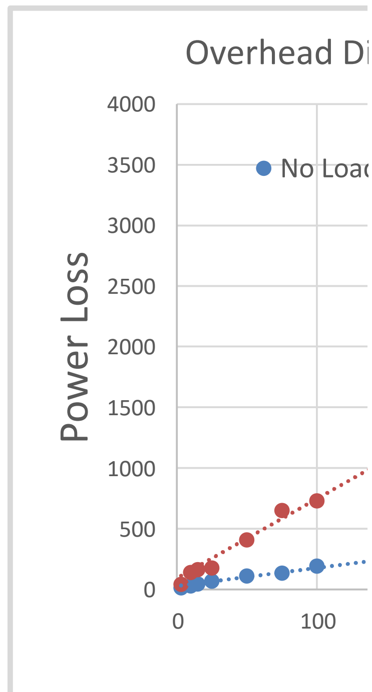
12.5	25	ABB	321	0.06641	21.3171285
12.5	25	ALAMO	225	0.06641	14.9419125
12.5	25	ALAMO-TRANS	18	0.06641	1.195353
12.5	25	ALLIS CHALMERS	37	0.06641	2.4571145
12.5	25	AMERICAN ELECTRIC	1	0.06641	0.0664085
12.5	25	AMI	1	0.06641	0.0664085
12.5	25	ANDERSON	1	0.06641	0.0664085
12.5	25	ATSCO	29	0.06641	1.9258465
12.5	25	CENTRAL MALONEY	1474	0.06641	97.886129
12.5	25	COOPER	1427	0.06641	94.7649295
12.5	25	DUNCAN	2	0.06641	0.132817
12.5	25	EATON	12	0.06641	0.796902
12.5	25	ERMCO	472	0.06641	31.344812
12.5	25	GENERAL ELECTRIC	1542	0.06641	102.401907
12.5	25	GREENVILLE	45	0.06641	2.9883825
12.5	25	HEVI DUTY	3	0.06641	0.1992255
12.5	25	HOWARD	3093	0.06641	205.4014905
12.5	25	KEARNEY	49	0.06641	3.2540165
12.5	25	KUHLMAN	239	0.06641	15.8716315
12.5	25	L.M.	39	0.06641	2.5899315
12.5	25	MCGRAW-EDISON	328	0.06641	21.781988
12.5	25	POWER PARTNERS/ABB	340	0.06641	22.57889
12.5	25	PRIESTER	5	0.06641	0.3320425
12.5	25	RTE	98	0.06641	6.508033
12.5	25	UNKNOWN	4862	0.06641	322.878127
12.5	25	unset	115	0.06641	7.6369775
12.5	25	WESTINGHOUSE	286	0.06641	18.992831
12.5	37.5	ALAMO-TRANS	1	0.08497	0.08497475
12.5	37.5	ALLIS CHALMERS	3	0.08497	0.25492425
12.5	37.5	GENERAL ELECTRIC	8	0.08497	0.679798
12.5	37.5	HOWARD	2	0.08497	0.1699495
12.5	37.5	KEARNEY	7	0.08497	0.59482325
12.5	37.5	L.M.	3	0.08497	0.25492425
12.5	37.5	MCGRAW-EDISON	6	0.08497	0.5098485
12.5	37.5	UNKNOWN	137	0.08497	11.64154075
12.5	37.5	WESTINGHOUSE	9	0.08497	0.76477275
12.5	50	AB CHANGE	1	0.10354	0.103541
12.5	50	ABB	300	0.10354	31.0623
12.5	50	ALAMO	187	0.10354	19.362167
12.5	50	ALAMO-TRANS	11	0.10354	1.138951
12.5	50	ALLIS CHALMERS	145	0.10354	15.013445
12.5	50	AMI	2	0.10354	0.207082
12.5	50	ATSCO	33	0.10354	3.416853
12.5	50	CENTRAL MALONEY	1793	0.10354	185.649013
12.5	50	COOPER	1152	0.10354	119.279232
12.5	50	DIXIE ELECTRIC	1	0.10354	0.103541
12.5	50	DUNCAN	1	0.10354	0.103541
12.5	50	EATON	8	0.10354	0.828328
12.5	50	ERMCO	459	0.10354	47.525319
12.5	50	GENERAL ELECTRIC	1849	0.10354	191.447309
12.5	50	GREENVILLE	28	0.10354	2.899148

12.5	50	HEVI DUTY	2	0.10354	0.207082
12.5	50	HOWARD	3017	0.10354	312.383197
12.5	50	KEARNEY	199	0.10354	20.604659
12.5	50	KUHLMAN	224	0.10354	23.193184
12.5	50	L.M.	86	0.10354	8.904526
12.5	50	MCGRAW-EDISON	685	0.10354	70.925585
12.5	50	MEMCO	1	0.10354	0.103541
12.5	50	POWER PARTNERS/ABB	295	0.10354	30.544595
12.5	50	RTE	376	0.10354	38.931416
12.5	50	SYLVANIA	1	0.10354	0.103541
12.5	50	UNKNOWN	6194	0.10354	641.332954
12.5	50	unset	72	0.10354	7.454952
12.5	50	WESTINGHOUSE	427	0.10354	44.212007
12.5	75	ABB	66	0.14067	9.284451
12.5	75	ALAMO	33	0.14067	4.6422255
12.5	75	ALAMO-TRANS	1	0.14067	0.1406735
12.5	75	ALLIS CHALMERS	17	0.14067	2.3914495
12.5	75	AMI	1	0.14067	0.1406735
12.5	75	ATSCO	4	0.14067	0.562694
12.5	75	CENTRAL MALONEY	517	0.14067	72.7281995
12.5	75	COOPER	295	0.14067	41.4986825
12.5	75	DIXIE ELECTRIC	2	0.14067	0.281347
12.5	75	EATON	10	0.14067	1.406735
12.5	75	ERMCO	279	0.14067	39.2479065
12.5	75	GENERAL ELECTRIC	344	0.14067	48.391684
12.5	75	GREENVILLE	11	0.14067	1.5474085
12.5	75	HOWARD	903	0.14067	127.0281705
12.5	75	KEARNEY	49	0.14067	6.8930015
12.5	75	KUHLMAN	30	0.14067	4.220205
12.5	75	L.M.	11	0.14067	1.5474085
12.5	75	MCGRAW-EDISON	135	0.14067	18.9909225
12.5	75	POWER PARTNERS/ABB	22	0.14067	3.094817
12.5	75	RTE	49	0.14067	6.8930015
12.5	75	UNKNOWN	1162	0.14067	163.462607
12.5	75	unset	16	0.14067	2.250776
12.5	75	WESTINGHOUSE	87	0.14067	12.2385945
12.5	100	ABB	17	0.17781	3.022702
12.5	100	ALAMO	14	0.17781	2.489284
12.5	100	ALAMO-TRANS	1	0.17781	0.177806
12.5	100	ALLIS CHALMERS	12	0.17781	2.133672
12.5	100	ATSCO	3	0.17781	0.533418
12.5	100	CENTRAL MALONEY	335	0.17781	59.56501
12.5	100	COOPER	110	0.17781	19.55866
12.5	100	DIXIE ELECTRIC	1	0.17781	0.177806
12.5	100	EATON	1	0.17781	0.177806
12.5	100	ERMCO	180	0.17781	32.00508
12.5	100	GENERAL ELECTRIC	209	0.17781	37.161454
12.5	100	GREENVILLE	6	0.17781	1.066836
12.5	100	HOWARD	668	0.17781	118.774408
12.5	100	KEARNEY	23	0.17781	4.089538
12.5	100	KUHLMAN	61	0.17781	10.846166

12.5	100	L.M.	8	0.17781	1.422448
12.5	100	MCGRAW-EDISON	133	0.17781	23.648198
12.5	100	POWER PARTNERS/ABB	13	0.17781	2.311478
12.5	100	RTE	80	0.17781	14.22448
12.5	100	TRENCH ELECTRIC	1	0.17781	0.177806
12.5	100	UNKNOWN	975	0.17781	173.36085
12.5	100	unset	12	0.17781	2.133672
12.5	100	WESTINGHOUSE	79	0.17781	14.046674
12.5	167	ABB	15	0.27732	4.1598165
12.5	167	ALAMO	8	0.27732	2.2185688
12.5	167	ALAMO-TRANS	1	0.27732	0.2773211
12.5	167	ALLIS CHALMERS	4	0.27732	1.1092844
12.5	167	ATSCO	2	0.27732	0.5546422
12.5	167	CENTRAL MALONEY	132	0.27732	36.6063852
12.5	167	COOPER	100	0.27732	27.73211
12.5	167	EATON	5	0.27732	1.3866055
12.5	167	ERMCO	28	0.27732	7.7649908
12.5	167	GENERAL ELECTRIC	12	0.27732	3.3278532
12.5	167	GREENVILLE	2	0.27732	0.5546422
12.5	167	HOWARD	289	0.27732	80.1457979
12.5	167	KEARNEY	6	0.27732	1.6639266
12.5	167	KUHLMAN	24	0.27732	6.6557064
12.5	167	L.M.	2	0.27732	0.5546422
12.5	167	MCGRAW-EDISON	66	0.27732	18.3031926
12.5	167	POWER PARTNERS/ABB	7	0.27732	1.9412477
12.5	167	RTE	15	0.27732	4.1598165
12.5	167	TRENCH ELECTRIC	1	0.27732	0.2773211
12.5	167	UNKNOWN	356	0.27732	98.7263116
12.5	167	unset	14	0.27732	3.8824954
12.5	167	WESTINGHOUSE	17	0.27732	4.7144587
12.5	250	unset	3	0.40060	1.201803
12.5	500	UNKNOWN	3	0.77193	2.315778
Total			43761	22.1759899	4371.817945

Test Report LL (kW)	Total Test Report LL (kW)	Total KVA	
0.013893058	0.138930576	15	1ph
0.013893058	0.013893058	1.5	1ph
0.013893058	0.041679173	4.5	1ph
0.013893058	0.027786115	3	1ph
0.013893058	0.041679173	4.5	1ph
0.015207841	0.045623524	9	1ph
0.015207841	0.015207841	3	1ph
0.015207841	0.136870571	27.0000	1ph
0.016960886	0.016960886	5	1ph
0.016960886	0.016960886	5	1ph
0.016960886	0.169608862	50	1ph
0.016960886	0.033921772	10	1ph
0.021343499	0.192091487	90	1ph
0.021343499	0.021343499	10	1ph
0.021343499	0.021343499	10	1ph
0.021343499	0.74702245	350	1ph
0.021343499	9.135017389	4280	1ph
0.021343499	0.213434986	100	1ph
0.021343499	3.222868285	1510	1ph
0.021343499	0.512243966	240	1ph
0.021343499	0.128060991	60	1ph
0.021343499	0.021343499	10	1ph
0.021343499	10.11681832	4740	1ph
0.021343499	0.064030496	30	1ph
0.021343499	0.14940449	70	1ph
0.021343499	0.128060991	60	1ph
0.021343499	0.469556969	220	1ph
0.021343499	0.021343499	10	1ph
0.021343499	3.13749429	1470	1ph
0.021343499	0.256121983	120	1ph
0.021343499	0.554930963	260	1ph
0.025726111	0.874687772	510	1ph
0.025726111	0.051452222	30	1ph
0.025726111	0.334439442	195	1ph
0.025726111	0.334439442	195	1ph
0.025726111	1.620744989	945	1ph
0.025726111	0.025726111	15	1ph
0.025726111	0.025726111	15	1ph
0.025726111	1.492114434	870	1ph
0.025726111	3.57592942	2085	1ph
0.025726111	0.643152773	375	1ph
0.025726111	0.051452222	30	1ph
0.025726111	0.617426662	360	1ph
0.025726111	1.878006098	1095	1ph
0.025726111	0.334439442	195	1ph
0.025726111	23.61656984	13770	1ph
0.025726111	0.128630555	75	1ph
0.025726111	2.058088875	1200	1ph

kVA
3
10
15
25
50
75
100
167
300
500

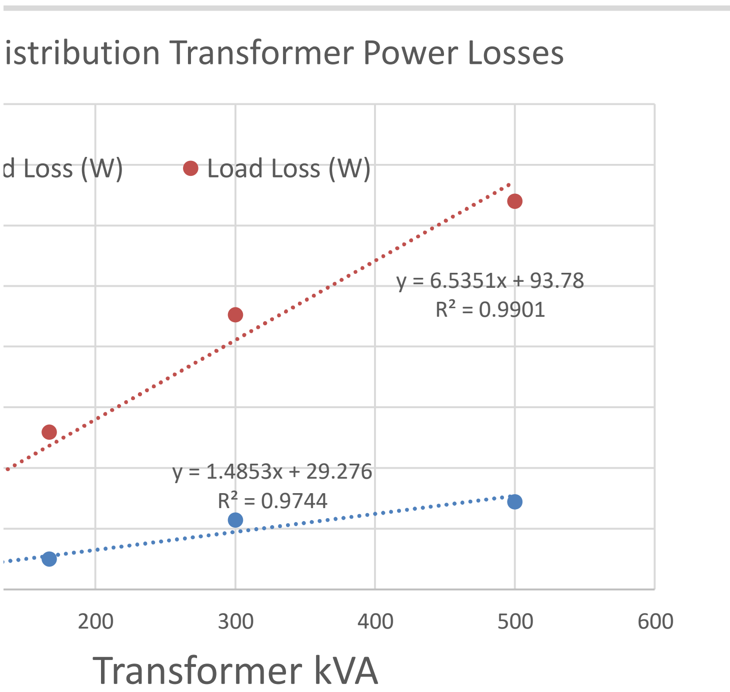


0.034491336	11.07171875	8025	1ph
0.034491336	7.760550523	5625	1ph
0.034491336	0.620844042	450	1ph
0.034491336	1.276179419	925	1ph
0.034491336	0.034491336	25	1ph
0.034491336	0.034491336	25	1ph
0.034491336	0.034491336	25	1ph
0.034491336	1.000248734	725	1ph
0.034491336	50.84022876	36850	1ph
0.034491336	49.21913598	35675	1ph
0.034491336	0.068982671	50	1ph
0.034491336	0.413896028	300	1ph
0.034491336	16.27991043	11800	1ph
0.034491336	53.18563958	38550	1ph
0.034491336	1.552110105	1125	1ph
0.034491336	0.103474007	75	1ph
0.034491336	106.6817012	77325	1ph
0.034491336	1.690075447	1225	1ph
0.034491336	8.243429222	5975	1ph
0.034491336	1.345162091	975	1ph
0.034491336	11.3131581	8200	1ph
0.034491336	11.72705412	8500	1ph
0.034491336	0.172456678	125	1ph
0.034491336	3.380150894	2450	1ph
0.034491336	167.696874	121550	1ph
0.034491336	3.966503601	2875	1ph
0.034491336	9.864521998	7150	1ph
0.045447867	0.045447867	37.5	1ph
0.045447867	0.1363436	112.5	1ph
0.045447867	0.363582932	300	1ph
0.045447867	0.090895733	75	1ph
0.045447867	0.318135066	262.5	1ph
0.045447867	0.1363436	112.5	1ph
0.045447867	0.272687199	225	1ph
0.045447867	6.226357719	5137.5	1ph
0.045447867	0.409030799	337.5	1ph
0.056404397	0.056404397	50	1ph
0.056404397	16.92131924	15000	1ph
0.056404397	10.54762233	9350	1ph
0.056404397	0.620448372	550	1ph
0.056404397	8.178637632	7250	1ph
0.056404397	0.112808795	100	1ph
0.056404397	1.861345116	1650	1ph
0.056404397	101.1330847	89650	1ph
0.056404397	64.97786588	57600	1ph
0.056404397	0.056404397	50	1ph
0.056404397	0.056404397	50	1ph
0.056404397	0.45123518	400	1ph
0.056404397	25.88961844	22950	1ph
0.056404397	104.2917309	92450	1ph
0.056404397	1.579323129	1400	1ph

0.056404397	0.112808795	100	1ph
0.056404397	170.1720671	150850	1ph
0.056404397	11.2244751	9950	1ph
0.056404397	12.63458503	11200	1ph
0.056404397	4.850778182	4300	1ph
0.056404397	38.63701226	34250	1ph
0.056404397	0.056404397	50	1ph
0.056404397	16.63929725	14750	1ph
0.056404397	21.20805345	18800	1ph
0.056404397	0.056404397	50	1ph
0.056404397	349.3688379	309700	1ph
0.056404397	4.061116617	3600	1ph
0.056404397	24.08467772	21350	1ph
0.078317459	5.168952312	4950	1ph
0.078317459	2.584476156	2475	1ph
0.078317459	0.078317459	75	1ph
0.078317459	1.331396808	1275	1ph
0.078317459	0.078317459	75	1ph
0.078317459	0.313269837	300	1ph
0.078317459	40.49012644	38775	1ph
0.078317459	23.10365048	22125	1ph
0.078317459	0.156634919	150	1ph
0.078317459	0.783174593	750	1ph
0.078317459	21.85057114	20925	1ph
0.078317459	26.94120599	25800	1ph
0.078317459	0.861492052	825	1ph
0.078317459	70.72066572	67725	1ph
0.078317459	3.837555504	3675	1ph
0.078317459	2.349523778	2250	1ph
0.078317459	0.861492052	825	1ph
0.078317459	10.572857	10125	1ph
0.078317459	1.722984104	1650	1ph
0.078317459	3.837555504	3675	1ph
0.078317459	91.00488767	87150	1ph
0.078317459	1.253079348	1200	1ph
0.078317459	6.813618956	6525	1ph
0.100230521	1.703918858	1700	1ph
0.100230521	1.403227295	1400	1ph
0.100230521	0.100230521	100	1ph
0.100230521	1.202766253	1200	1ph
0.100230521	0.300691563	300	1ph
0.100230521	33.57722456	33500	1ph
0.100230521	11.02535732	11000	1ph
0.100230521	0.100230521	100	1ph
0.100230521	0.100230521	100	1ph
0.100230521	18.04149379	18000	1ph
0.100230521	20.9481789	20900	1ph
0.100230521	0.601383126	600	1ph
0.100230521	66.95398808	66800	1ph
0.100230521	2.305301985	2300	1ph
0.100230521	6.114061786	6100	1ph

0.100230521	0.801844169	800	1ph
0.100230521	13.3306593	13300	1ph
0.100230521	1.302996774	1300	1ph
0.100230521	8.018441686	8000	1ph
0.100230521	0.100230521	100	1ph
0.100230521	97.72475805	97500	1ph
0.100230521	1.202766253	1200	1ph
0.100230521	7.918211165	7900	1ph
0.158957527	2.384362901	2505	1ph
0.158957527	1.271660214	1336	1ph
0.158957527	0.158957527	167	1ph
0.158957527	0.635830107	668	1ph
0.158957527	0.317915053	334	1ph
0.158957527	20.98239353	22044	1ph
0.158957527	15.89575267	16700	1ph
0.158957527	0.794787634	835	1ph
0.158957527	4.450810748	4676	1ph
0.158957527	1.907490321	2004	1ph
0.158957527	0.317915053	334	1ph
0.158957527	45.93872522	48263	1ph
0.158957527	0.95374516	1002	1ph
0.158957527	3.814980641	4008	1ph
0.158957527	0.317915053	334	1ph
0.158957527	10.49119676	11022	1ph
0.158957527	1.112702687	1169	1ph
0.158957527	2.384362901	2505	1ph
0.158957527	0.158957527	167	1ph
0.158957527	56.58887951	59452	1ph
0.158957527	2.225405374	2338	1ph
0.158957527	2.702277954	2839	1ph
0.231708892	0.695126676	750	1ph
0.45083951	1.35251853	1500	1ph
12.23164024	2374.340425	2,080,840	

No Load Loss (W)	Load Loss (W)
14	43
31	141
47	164
70	178
111	409
135	652
192	730
250	1295
571	2262
721	3200



VOLTAGE	PHASING	KVA	MANUFACTURER	QTY	Test Report NLL (kW)
12.5	1ph	25	ABB	12	0.27685
12.5	1ph	25	ALAMO	9	0.27685
12.5	1ph	25	ALLIS CHALMERS	1	0.27685
12.5	1ph	25	ATSCO	11	0.27685
12.5	1ph	25	CENTRAL MALONEY	461	0.27685
12.5	1ph	25	COOPER	277	0.27685
12.5	1ph	25	EATON	10	0.27685
12.5	1ph	25	ERMCO	146	0.27685
12.5	1ph	25	GENERAL ELECTRIC	200	0.27685
12.5	1ph	25	HOWARD	530	0.27685
12.5	1ph	25	KUHLMAN	73	0.27685
12.5	1ph	25	MCGRAW-EDISON	18	0.27685
12.5	1ph	25	PRIESTER	1	0.27685
12.5	1ph	25	RTE	46	0.27685
12.5	1ph	25	UNKNOWN	40	0.27685
12.5	1ph	25	unset	12	0.27685
12.5	1ph	25	WESTINGHOUSE	30	0.27685
12.5	1ph	37	HOWARD	1	0.28997
12.5	1ph	37	RTE	1	0.28997
12.5	1ph	50	AB CHANGE	5	0.30418
12.5	1ph	50	ABB	810	0.30418
12.5	1ph	50	ALAMO	53	0.30418
12.5	1ph	50	ALLIS CHALMERS	1	0.30418
12.5	1ph	50	AMERICAN ELECTRIC	3	0.30418
12.5	1ph	50	AMERICAN SWITCHGEAR	6	0.30418
12.5	1ph	50	ASTRA	1	0.30418
12.5	1ph	50	ATSCO	51	0.30418
12.5	1ph	50	BALTEAU STANDARD	1	0.30418
12.5	1ph	50	BLACKBURN	3	0.30418
12.5	1ph	50	C.G. POWER	1	0.30418
12.5	1ph	50	CENTRAL MALONEY	4482	0.30418
12.5	1ph	50	COOPER	910	0.30418
12.5	1ph	50	CROUSE HINDS	1	0.30418
12.5	1ph	50	DOWZER	2	0.30418
12.5	1ph	50	EATON	32	0.30418
12.5	1ph	50	ERMCO	723	0.30418
12.5	1ph	50	ESCO	2	0.30418
12.5	1ph	50	GENERAL ELECTRIC	2614	0.30418
12.5	1ph	50	GREENVILLE	1	0.30418
12.5	1ph	50	HOMAC	6	0.30418
12.5	1ph	50	HOWARD	5101	0.30418
12.5	1ph	50	JEFFERSON	1	0.30418
12.5	1ph	50	KEARNEY	2	0.30418
12.5	1ph	50	KUHLMAN	849	0.30418
12.5	1ph	50	L.M.	24	0.30418
12.5	1ph	50	MCGRAW-EDISON	643	0.30418
12.5	1ph	50	PAUWELS	1	0.30418
12.5	1ph	50	PRIESTER	2	0.30418
12.5	1ph	50	RCOC	1	0.30418

12.5	1ph	50	RTE	1245	0.30418
12.5	1ph	50	S & D ELECTRIC CO.	1	0.30418
12.5	1ph	50	SANGAMO	1	0.30418
12.5	1ph	50	SIERRA	1	0.30418
12.5	1ph	50	SYLVANIA	3	0.30418
12.5	1ph	50	TRENCH ELECTRIC	4	0.30418
12.5	1ph	50	UCSO	1	0.30418
12.5	1ph	50	UNIVERSAL POLE BRACK	1	0.30418
12.5	1ph	50	UNKNOWN	356	0.30418
12.5	1ph	50	unset	93	0.30418
12.5	1ph	50	WESTINGHOUSE	1613	0.30418
12.5	1ph	75	AB CHANGE	1	0.33151
12.5	1ph	75	ABB	478	0.33151
12.5	1ph	75	ALAMO	28	0.33151
12.5	1ph	75	ALLIS CHALMERS	1	0.33151
12.5	1ph	75	AMERICAN ELECTRIC	1	0.33151
12.5	1ph	75	ATSCO	36	0.33151
12.5	1ph	75	CENTRAL MALONEY	1435	0.33151
12.5	1ph	75	COOPER	769	0.33151
12.5	1ph	75	CROUSE HINDS	1	0.33151
12.5	1ph	75	DUNCAN	1	0.33151
12.5	1ph	75	EATON	9	0.33151
12.5	1ph	75	ERMCO	486	0.33151
12.5	1ph	75	ESCO	2	0.33151
12.5	1ph	75	GENERAL ELECTRIC	929	0.33151
12.5	1ph	75	GREENVILLE	2	0.33151
12.5	1ph	75	HOMAC	4	0.33151
12.5	1ph	75	HOWARD	2160	0.33151
12.5	1ph	75	JEFFERSON	1	0.33151
12.5	1ph	75	KEARNEY	1	0.33151
12.5	1ph	75	KUHLMAN	219	0.33151
12.5	1ph	75	MCGRAW-EDISON	164	0.33151
12.5	1ph	75	RTE	162	0.33151
12.5	1ph	75	UNKNOWN	115	0.33151
12.5	1ph	75	unset	26	0.33151
12.5	1ph	75	VANTRAN	3	0.33151
12.5	1ph	75	WAGNER	1	0.33151
12.5	1ph	75	WESTINGHOUSE	456	0.33151
12.5	1ph	100	ABB	340	0.35884
12.5	1ph	100	ALAMO	26	0.35884
12.5	1ph	100	ATSCO	23	0.35884
12.5	1ph	100	BALTEAU STANDARD	1	0.35884
12.5	1ph	100	CENTRAL MALONEY	768	0.35884
12.5	1ph	100	COOPER	527	0.35884
12.5	1ph	100	EATON	11	0.35884
12.5	1ph	100	ERMCO	325	0.35884
12.5	1ph	100	ESCO	5	0.35884
12.5	1ph	100	GENERAL ELECTRIC	433	0.35884
12.5	1ph	100	HOMAC	1	0.35884
12.5	1ph	100	HOWARD	1149	0.35884
12.5	1ph	100	KEARNEY	1	0.35884

12.5	1ph	100	KUHLMAN	145	0.35884
12.5	1ph	100	MCGRAW-EDISON	66	0.35884
12.5	1ph	100	PAUWELS	1	0.35884
12.5	1ph	100	RTE	75	0.35884
12.5	1ph	100	TRENCH ELECTRIC	2	0.35884
12.5	1ph	100	UNKNOWN	53	0.35884
12.5	1ph	100	unset	6	0.35884
12.5	1ph	100	VANTRAN	13	0.35884
12.5	1ph	100	WESTINGHOUSE	281	0.35884
12.5	1ph	125	ABB	3	0.38617
12.5	1ph	125	CENTRAL MALONEY	1	0.38617
12.5	1ph	125	RTE	1	0.38617
12.5	1ph	125	unset	2	0.38617
12.5	1ph	125	VANTRAN	3	0.38617
12.5	1ph	150	ABB	5	0.41350
12.5	1ph	150	GENERAL ELECTRIC	4	0.41350
12.5	1ph	150	unset	2	0.41350
12.5	1ph	150	WESTINGHOUSE	1	0.41350
12.5	1ph	167	ABB	64	0.43208
12.5	1ph	167	ALAMO	3	0.43208
12.5	1ph	167	ATSCO	5	0.43208
12.5	1ph	167	CENTRAL MALONEY	467	0.43208
12.5	1ph	167	COOPER	187	0.43208
12.5	1ph	167	EATON	1	0.43208
12.5	1ph	167	ERMCO	52	0.43208
12.5	1ph	167	ESCO	1	0.43208
12.5	1ph	167	GENERAL ELECTRIC	94	0.43208
12.5	1ph	167	GREENVILLE	3	0.43208
12.5	1ph	167	HOMAC	1	0.43208
12.5	1ph	167	HOWARD	515	0.43208
12.5	1ph	167	JEFFERSON	1	0.43208
12.5	1ph	167	KUHLMAN	16	0.43208
12.5	1ph	167	MCGRAW-EDISON	77	0.43208
12.5	1ph	167	RTE	136	0.43208
12.5	1ph	167	SIERRA	4	0.43208
12.5	1ph	167	TRENCH ELECTRIC	1	0.43208
12.5	1ph	167	UNKNOWN	17	0.43208
12.5	1ph	167	unset	5	0.43208
12.5	1ph	167	VANTRAN	10	0.43208
12.5	1ph	167	WESTINGHOUSE	211	0.43208
12.5	1ph	167	ZINSCO	1	0.43208
12.5	1ph	175	unset	1	0.44083
12.5	1ph	200	GENERAL ELECTRIC	4	0.46816
12.5	1ph	200	SIERRA	1	0.46816
12.5	1ph	200	ZINSCO	2	0.46816
12.5	1ph	225	unset	1	0.49549
12.5	1ph	250	CENTRAL MALONEY	84	0.52282
12.5	1ph	250	COOPER	15	0.52282
12.5	1ph	250	GENERAL ELECTRIC	4	0.52282
12.5	1ph	250	HOWARD	64	0.52282
12.5	1ph	250	MCGRAW-EDISON	30	0.52282

12.5	1ph	250	RTE	3	0.52282
12.5	1ph	250	SIERRA	1	0.52282
12.5	1ph	250	TRENCH ELECTRIC	1	0.52282
12.5	1ph	250	UNKNOWN	2	0.52282
12.5	1ph	250	unset	1	0.52282
12.5	1ph	250	VANTRAN	1	0.52282
12.5	1ph	250	WESTINGHOUSE	4	0.52282
12.5	1ph	300	CENTRAL MALONEY	1	0.57748
12.5	1ph	300	SIERRA	1	0.57748
12.5	1ph	300	TRENCH ELECTRIC	2	0.57748
12.5	1ph	300	VANTRAN	1	0.57748
12.5	1ph	333	GENERAL ELECTRIC	5	0.61356
12.5	1ph	333	MCGRAW-EDISON	1	0.61356
12.5	1ph	333	SIERRA	1	0.61356
12.5	1ph	500	VANTRAN	3	0.79612
12.5	1ph	500	WESTINGHOUSE	2	0.79612
12.5	1ph	750	CENTRAL MALONEY	1	1.06942
12.5	3ph	75	ABB	123	0.33151
12.5	3ph	75	C.G. POWER	7	0.33151
12.5	3ph	75	CENTRAL MALONEY	4	0.33151
12.5	3ph	75	COOPER	1	0.33151
12.5	3ph	75	ERMCO	1	0.33151
12.5	3ph	75	GENERAL ELECTRIC	31	0.33151
12.5	3ph	75	HOWARD	153	0.33151
12.5	3ph	75	PAUWELS	2	0.33151
12.5	3ph	75	RTE	3	0.33151
12.5	3ph	75	UNKNOWN	8	0.33151
12.5	3ph	75	unset	2	0.33151
12.5	3ph	100	ABB	1	0.35884
12.5	3ph	112	VANTRAN	1	0.37196
12.5	3ph	150	ABB	227	0.41350
12.5	3ph	150	ALAMO	1	0.41350
12.5	3ph	150	C.G. POWER	28	0.41350
12.5	3ph	150	CENTRAL MALONEY	5	0.41350
12.5	3ph	150	COOPER	21	0.41350
12.5	3ph	150	GENERAL ELECTRIC	45	0.41350
12.5	3ph	150	HOWARD	331	0.41350
12.5	3ph	150	MCGRAW-EDISON	5	0.41350
12.5	3ph	150	PAUWELS	3	0.41350
12.5	3ph	150	RTE	38	0.41350
12.5	3ph	150	TRENCH ELECTRIC	2	0.41350
12.5	3ph	150	UNKNOWN	29	0.41350
12.5	3ph	150	unset	7	0.41350
12.5	3ph	150	WESTINGHOUSE	96	0.41350
12.5	3ph	167	HOWARD	1	0.43208
12.5	3ph	225	ABB	15	0.49549
12.5	3ph	225	GENERAL ELECTRIC	10	0.49549
12.5	3ph	225	HOWARD	54	0.49549
12.5	3ph	225	UNKNOWN	3	0.49549
12.5	3ph	225	VANTRAN	1	0.49549
12.5	3ph	250	HOWARD	1	0.52282

12.5	3ph	300	ABB	413	0.57748
12.5	3ph	300	C.G. POWER	168	0.57748
12.5	3ph	300	CENTRAL MALONEY	5	0.57748
12.5	3ph	300	COOPER	8	0.57748
12.5	3ph	300	GENERAL ELECTRIC	88	0.57748
12.5	3ph	300	HOWARD	245	0.57748
12.5	3ph	300	KUHLMAN	4	0.57748
12.5	3ph	300	L.M.	1	0.57748
12.5	3ph	300	MCGRAW-EDISON	11	0.57748
12.5	3ph	300	PAUWELS	9	0.57748
12.5	3ph	300	PRIESTER	13	0.57748
12.5	3ph	300	RTE	1	0.57748
12.5	3ph	300	SQUARE D	1	0.57748
12.5	3ph	300	SYLVANIA	1	0.57748
12.5	3ph	300	UNKNOWN	34	0.57748
12.5	3ph	300	unset	4	0.57748
12.5	3ph	300	WESTINGHOUSE	139	0.57748
12.5	3ph	333	GENERAL ELECTRIC	1	0.61356
12.5	3ph	500	AB CHANGE	1	0.79612
12.5	3ph	500	ABB	344	0.79612
12.5	3ph	500	ALAMO	1	0.79612
12.5	3ph	500	ANDERSON	1	0.79612
12.5	3ph	500	C.G. POWER	210	0.79612
12.5	3ph	500	CENTRAL MALONEY	16	0.79612
12.5	3ph	500	COOPER	23	0.79612
12.5	3ph	500	GENERAL ELECTRIC	104	0.79612
12.5	3ph	500	HOWARD	133	0.79612
12.5	3ph	500	KUHLMAN	3	0.79612
12.5	3ph	500	L.M.	2	0.79612
12.5	3ph	500	MCGRAW-EDISON	45	0.79612
12.5	3ph	500	PAUWELS	18	0.79612
12.5	3ph	500	PRIESTER	4	0.79612
12.5	3ph	500	RTE	1	0.79612
12.5	3ph	500	S & D ELECTRIC CO.	2	0.79612
12.5	3ph	500	SQUARE D	40	0.79612
12.5	3ph	500	TRENCH ELECTRIC	2	0.79612
12.5	3ph	500	UNKNOWN	21	0.79612
12.5	3ph	500	unset	1	0.79612
12.5	3ph	500	WEG	5	0.79612
12.5	3ph	500	WESTINGHOUSE	200	0.79612
12.5	3ph	750	ABB	213	1.06942
12.5	3ph	750	ALAMO	2	1.06942
12.5	3ph	750	ANDERSON	1	1.06942
12.5	3ph	750	C.G. POWER	111	1.06942
12.5	3ph	750	CENTRAL MALONEY	1	1.06942
12.5	3ph	750	COOPER	33	1.06942
12.5	3ph	750	EATON	3	1.06942
12.5	3ph	750	GENERAL ELECTRIC	90	1.06942
12.5	3ph	750	HOWARD	107	1.06942
12.5	3ph	750	KUHLMAN	5	1.06942
12.5	3ph	750	L.M.	2	1.06942

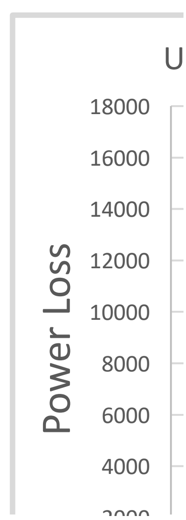
12.5	3ph	750	MCGRAW-EDISON	41	1.06942
12.5	3ph	750	PAUWELS	8	1.06942
12.5	3ph	750	PIONEER	4	1.06942
12.5	3ph	750	PRIESTER	2	1.06942
12.5	3ph	750	RTE	4	1.06942
12.5	3ph	750	SQUARE D	25	1.06942
12.5	3ph	750	TRENCH ELECTRIC	1	1.06942
12.5	3ph	750	UNKNOWN	12	1.06942
12.5	3ph	750	unset	7	1.06942
12.5	3ph	750	WEG	8	1.06942
12.5	3ph	750	WESTINGHOUSE	47	1.06942
12.5	3ph	1000	ABB	100	1.34272
12.5	3ph	1000	C.G. POWER	68	1.34272
12.5	3ph	1000	CENTRAL MALONEY	4	1.34272
12.5	3ph	1000	COOPER	14	1.34272
12.5	3ph	1000	GENERAL ELECTRIC	38	1.34272
12.5	3ph	1000	HOWARD	32	1.34272
12.5	3ph	1000	KUHLMAN	9	1.34272
12.5	3ph	1000	MCGRAW-EDISON	27	1.34272
12.5	3ph	1000	PAUWELS	10	1.34272
12.5	3ph	1000	PRIESTER	9	1.34272
12.5	3ph	1000	RTE	4	1.34272
12.5	3ph	1000	SQUARE D	15	1.34272
12.5	3ph	1000	UNKNOWN	5	1.34272
12.5	3ph	1000	unset	2	1.34272
12.5	3ph	1000	WESTINGHOUSE	17	1.34272
12.5	3ph	1500	ABB	128	1.88932
12.5	3ph	1500	C.G. POWER	52	1.88932
12.5	3ph	1500	COOPER	1	1.88932
12.5	3ph	1500	GENERAL ELECTRIC	54	1.88932
12.5	3ph	1500	HOWARD	33	1.88932
12.5	3ph	1500	MCGRAW-EDISON	1	1.88932
12.5	3ph	1500	PAUWELS	15	1.88932
12.5	3ph	1500	PRIESTER	5	1.88932
12.5	3ph	1500	RTE	3	1.88932
12.5	3ph	1500	SQUARE D	8	1.88932
12.5	3ph	1500	UNKNOWN	6	1.88932
12.5	3ph	1500	WESTINGHOUSE	16	1.88932
12.5	3ph	2000	ABB	39	2.43592
12.5	3ph	2000	C.G. POWER	12	2.43592
12.5	3ph	2000	COOPER	1	2.43592
12.5	3ph	2000	GENERAL ELECTRIC	35	2.43592
12.5	3ph	2000	HOWARD	14	2.43592
12.5	3ph	2000	KUHLMAN	3	2.43592
12.5	3ph	2000	MCGRAW-EDISON	2	2.43592
12.5	3ph	2000	PAUWELS	7	2.43592
12.5	3ph	2000	PRIESTER	1	2.43592
12.5	3ph	2000	RTE	3	2.43592
12.5	3ph	2000	SQUARE D	4	2.43592
12.5	3ph	2000	UNKNOWN	4	2.43592
12.5	3ph	2000	WESTINGHOUSE	2	2.43592

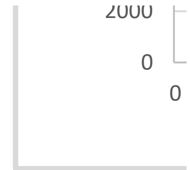
12.5	3ph	2500	ABB	47	2.98252
12.5	3ph	2500	C.G. POWER	21	2.98252
12.5	3ph	2500	GENERAL ELECTRIC	8	2.98252
12.5	3ph	2500	HOWARD	9	2.98252
12.5	3ph	2500	MCGRAW-EDISON	1	2.98252
12.5	3ph	2500	PAUWELS	2	2.98252
12.5	3ph	2500	PRIESTER	2	2.98252
12.5	3ph	2500	RTE	1	2.98252
12.5	3ph	2500	SQUARE D	2	2.98252
12.5	3ph	2500	UNKNOWN	2	2.98252
12.5	3ph	5000	ABB	2	5.71552
12.5	3ph	12500	UNKNOWN	2	13.91452
Total		**158901**		**40616**	**253**

Test Report Total NLL (kW)	Test Report LL (kW)	Test Report Total LL (kW)	Total KVA
3.32	0.07778062	0.93	300
2.49	0.07778062	0.70	225
0.28	0.07778062	0.08	25
3.05	0.07778062	0.86	275
127.63	0.07778062	35.86	11525
76.69	0.07778062	21.55	6925
2.77	0.07778062	0.78	250
40.42	0.07778062	11.36	3650
55.37	0.07778062	15.56	5000
146.73	0.07778062	41.22	13250
20.21	0.07778062	5.68	1825
4.98	0.07778062	1.40	450
0.28	0.07778062	0.08	25
12.74	0.07778062	3.58	1150
11.07	0.07778062	3.11	1000
3.32	0.07778062	0.93	300
8.31	0.07778062	2.33	750
0.29	0.08779496	0.09	37
0.29	0.08779496	0.09	37
1.52	0.09864382	0.49	250
246.39	0.09864382	79.90	40500
16.12	0.09864382	5.23	2650
0.30	0.09864382	0.10	50
0.91	0.09864382	0.30	150
1.83	0.09864382	0.59	300
0.30	0.09864382	0.10	50
15.51	0.09864382	5.03	2550
0.30	0.09864382	0.10	50
0.91	0.09864382	0.30	150
0.30	0.09864382	0.10	50
1363.33	0.09864382	442.12	224100
276.80	0.09864382	89.77	45500
0.30	0.09864382	0.10	50
0.61	0.09864382	0.20	100
9.73	0.09864382	3.16	1600
219.92	0.09864382	71.32	36150
0.61	0.09864382	0.20	100
795.13	0.09864382	257.85	130700
0.30	0.09864382	0.10	50
1.83	0.09864382	0.59	300
1551.62	0.09864382	503.18	255050
0.30	0.09864382	0.10	50
0.61	0.09864382	0.20	100
258.25	0.09864382	83.75	42450
7.30	0.09864382	2.37	1200
195.59	0.09864382	63.43	32150
0.30	0.09864382	0.10	50
0.61	0.09864382	0.20	100
0.30	0.09864382	0.10	50

Test Report

KVA
75
75
75
75
150
150
150
225
225
300
300
300
500
500
500
500
500
500
750
750
750
750
1000
1000
1500
1500
2000
2500





378.70	0.09864382	122.81	62250
0.30	0.09864382	0.10	50
0.30	0.09864382	0.10	50
0.30	0.09864382	0.10	50
0.91	0.09864382	0.30	150
1.22	0.09864382	0.39	200
0.30	0.09864382	0.10	50
0.30	0.09864382	0.10	50
108.29	0.09864382	35.12	17800
28.29	0.09864382	9.17	4650
490.64	0.09864382	159.11	80650
0.33	0.11950701	0.12	75
158.46	0.11950701	57.12	35850
9.28	0.11950701	3.35	2100
0.33	0.11950701	0.12	75
0.33	0.11950701	0.12	75
11.93	0.11950701	4.30	2700
475.72	0.11950701	171.49	107625
254.93	0.11950701	91.90	57675
0.33	0.11950701	0.12	75
0.33	0.11950701	0.12	75
2.98	0.11950701	1.08	675
161.11	0.11950701	58.08	36450
0.66	0.11950701	0.24	150
307.97	0.11950701	111.02	69675
0.66	0.11950701	0.24	150
1.33	0.11950701	0.48	300
716.06	0.11950701	258.14	162000
0.33	0.11950701	0.12	75
0.33	0.11950701	0.12	75
72.60	0.11950701	26.17	16425
54.37	0.11950701	19.60	12300
53.70	0.11950701	19.36	12150
38.12	0.11950701	13.74	8625
8.62	0.11950701	3.11	1950
0.99	0.11950701	0.36	225
0.33	0.11950701	0.12	75
151.17	0.11950701	54.50	34200
122.01	0.14037021	47.73	34000
9.33	0.14037021	3.65	2600
8.25	0.14037021	3.23	2300
0.36	0.14037021	0.14	100
275.59	0.14037021	107.80	76800
189.11	0.14037021	73.98	52700
3.95	0.14037021	1.54	1100
116.62	0.14037021	45.62	32500
1.79	0.14037021	0.70	500
155.38	0.14037021	60.78	43300
0.36	0.14037021	0.14	100
412.31	0.14037021	161.29	114900
0.36	0.14037021	0.14	100

52.03	0.14037021	20.35	14500
23.68	0.14037021	9.26	6600
0.36	0.14037021	0.14	100
26.91	0.14037021	10.53	7500
0.72	0.14037021	0.28	200
19.02	0.14037021	7.44	5300
2.15	0.14037021	0.84	600
4.66	0.14037021	1.82	1300
100.83	0.14037021	39.44	28100
1.16	0.16123341	0.48	375
0.39	0.16123341	0.16	125
0.39	0.16123341	0.16	125
0.77	0.16123341	0.32	250
1.16	0.16123341	0.48	375
2.07	0.18209660	0.91	750
1.65	0.18209660	0.73	600
0.83	0.18209660	0.36	300
0.41	0.18209660	0.18	150
27.65	0.19628357	12.56	10688
1.30	0.19628357	0.59	501
2.16	0.19628357	0.98	835
201.78	0.19628357	91.66	77989
80.80	0.19628357	36.71	31229
0.43	0.19628357	0.20	167
22.47	0.19628357	10.21	8684
0.43	0.19628357	0.20	167
40.62	0.19628357	18.45	15698
1.30	0.19628357	0.59	501
0.43	0.19628357	0.20	167
222.52	0.19628357	101.09	86005
0.43	0.19628357	0.20	167
6.91	0.19628357	3.14	2672
33.27	0.19628357	15.11	12859
58.76	0.19628357	26.69	22712
1.73	0.19628357	0.79	668
0.43	0.19628357	0.20	167
7.35	0.19628357	3.34	2839
2.16	0.19628357	0.98	835
4.32	0.19628357	1.96	1670
91.17	0.19628357	41.42	35237
0.43	0.19628357	0.20	167
0.44	0.20295980	0.20	175
1.87	0.22382299	0.90	800
0.47	0.22382299	0.22	200
0.94	0.22382299	0.45	400
0.50	0.24468619	0.24	225
43.92	0.26554938	22.31	21000
7.84	0.26554938	3.98	3750
2.09	0.26554938	1.06	1000
33.46	0.26554938	17.00	16000
15.68	0.26554938	7.97	7500

1.57	0.26554938	0.80	750
0.52	0.26554938	0.27	250
0.52	0.26554938	0.27	250
1.05	0.26554938	0.53	500
0.52	0.26554938	0.27	250
0.52	0.26554938	0.27	250
2.09	0.26554938	1.06	1000
0.58	0.30727578	0.31	300
0.58	0.30727578	0.31	300
1.15	0.30727578	0.61	600
0.58	0.30727578	0.31	300
3.07	0.33481519	1.67	1665
0.61	0.33481519	0.33	333
0.61	0.33481519	0.33	333
2.39	0.47418134	1.42	1500
1.59	0.47418134	0.95	1000
1.07	0.68281330	0.68	750
40.78	0.11950701	14.70	9225
2.32	0.11950701	0.84	525
1.33	0.11950701	0.48	300
0.33	0.11950701	0.12	75
0.33	0.11950701	0.12	75
10.28	0.11950701	3.70	2325
50.72	0.11950701	18.28	11475
0.66	0.11950701	0.24	150
0.99	0.11950701	0.36	225
2.65	0.11950701	0.96	600
0.66	0.11950701	0.24	150
0.36	0.14037021	0.14	100
0.37	0.15038454	0.15	112
93.86	0.18209660	41.34	34050
0.41	0.18209660	0.18	150
11.58	0.18209660	5.10	4200
2.07	0.18209660	0.91	750
8.68	0.18209660	3.82	3150
18.61	0.18209660	8.19	6750
136.87	0.18209660	60.27	49650
2.07	0.18209660	0.91	750
1.24	0.18209660	0.55	450
15.71	0.18209660	6.92	5700
0.83	0.18209660	0.36	300
11.99	0.18209660	5.28	4350
2.89	0.18209660	1.27	1050
39.70	0.18209660	17.48	14400
0.43	0.19628357	0.20	167
7.43	0.24468619	3.67	3375
4.95	0.24468619	2.45	2250
26.76	0.24468619	13.21	12150
1.49	0.24468619	0.73	675
0.50	0.24468619	0.24	225
0.52	0.26554938	0.27	250

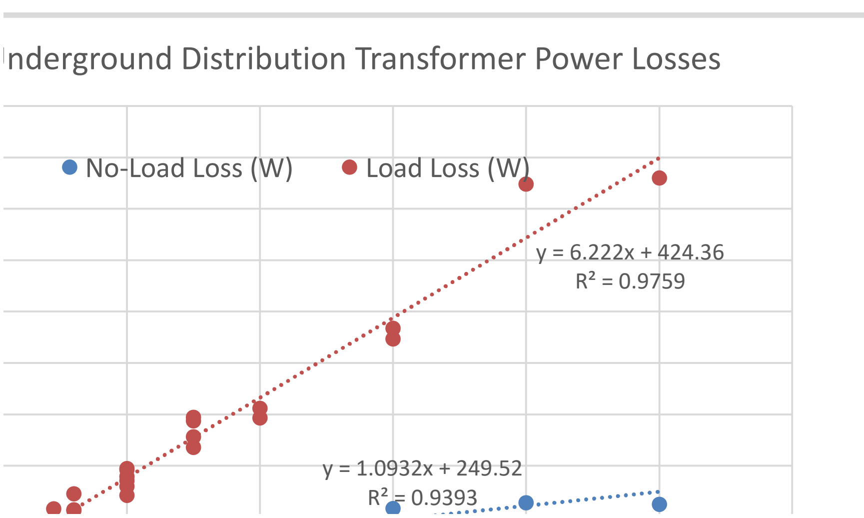
238.50	0.30727578	126.90	123900
97.02	0.30727578	51.62	50400
2.89	0.30727578	1.54	1500
4.62	0.30727578	2.46	2400
50.82	0.30727578	27.04	26400
141.48	0.30727578	75.28	73500
2.31	0.30727578	1.23	1200
0.58	0.30727578	0.31	300
6.35	0.30727578	3.38	3300
5.20	0.30727578	2.77	2700
7.51	0.30727578	3.99	3900
0.58	0.30727578	0.31	300
0.58	0.30727578	0.31	300
0.58	0.30727578	0.31	300
19.63	0.30727578	10.45	10200
2.31	0.30727578	1.23	1200
80.27	0.30727578	42.71	41700
0.61	0.33481519	0.33	333
0.80	0.47418134	0.47	500
273.87	0.47418134	163.12	172000
0.80	0.47418134	0.47	500
0.80	0.47418134	0.47	500
167.19	0.47418134	99.58	105000
12.74	0.47418134	7.59	8000
18.31	0.47418134	10.91	11500
82.80	0.47418134	49.31	52000
105.88	0.47418134	63.07	66500
2.39	0.47418134	1.42	1500
1.59	0.47418134	0.95	1000
35.83	0.47418134	21.34	22500
14.33	0.47418134	8.54	9000
3.18	0.47418134	1.90	2000
0.80	0.47418134	0.47	500
1.59	0.47418134	0.95	1000
31.84	0.47418134	18.97	20000
1.59	0.47418134	0.95	1000
16.72	0.47418134	9.96	10500
0.80	0.47418134	0.47	500
3.98	0.47418134	2.37	2500
159.22	0.47418134	94.84	100000
227.79	0.68281330	145.44	159750
2.14	0.68281330	1.37	1500
1.07	0.68281330	0.68	750
118.71	0.68281330	75.79	83250
1.07	0.68281330	0.68	750
35.29	0.68281330	22.53	24750
3.21	0.68281330	2.05	2250
96.25	0.68281330	61.45	67500
114.43	0.68281330	73.06	80250
5.35	0.68281330	3.41	3750
2.14	0.68281330	1.37	1500

43.85	0.68281330	28.00	30750
8.56	0.68281330	5.46	6000
4.28	0.68281330	2.73	3000
2.14	0.68281330	1.37	1500
4.28	0.68281330	2.73	3000
26.74	0.68281330	17.07	18750
1.07	0.68281330	0.68	750
12.83	0.68281330	8.19	9000
7.49	0.68281330	4.78	5250
8.56	0.68281330	5.46	6000
50.26	0.68281330	32.09	35250
134.27	0.89144526	89.14	100000
91.30	0.89144526	60.62	68000
5.37	0.89144526	3.57	4000
18.80	0.89144526	12.48	14000
51.02	0.89144526	33.87	38000
42.97	0.89144526	28.53	32000
12.08	0.89144526	8.02	9000
36.25	0.89144526	24.07	27000
13.43	0.89144526	8.91	10000
12.08	0.89144526	8.02	9000
5.37	0.89144526	3.57	4000
20.14	0.89144526	13.37	15000
6.71	0.89144526	4.46	5000
2.69	0.89144526	1.78	2000
22.83	0.89144526	15.15	17000
241.83	1.30870917	167.51	192000
98.24	1.30870917	68.05	78000
1.89	1.30870917	1.31	1500
102.02	1.30870917	70.67	81000
62.35	1.30870917	43.19	49500
1.89	1.30870917	1.31	1500
28.34	1.30870917	19.63	22500
9.45	1.30870917	6.54	7500
5.67	1.30870917	3.93	4500
15.11	1.30870917	10.47	12000
11.34	1.30870917	7.85	9000
30.23	1.30870917	20.94	24000
95.00	1.72597309	67.31	78000
29.23	1.72597309	20.71	24000
2.44	1.72597309	1.73	2000
85.26	1.72597309	60.41	70000
34.10	1.72597309	24.16	28000
7.31	1.72597309	5.18	6000
4.87	1.72597309	3.45	4000
17.05	1.72597309	12.08	14000
2.44	1.72597309	1.73	2000
7.31	1.72597309	5.18	6000
9.74	1.72597309	6.90	8000
9.74	1.72597309	6.90	8000
4.87	1.72597309	3.45	4000

140.18	2.14323700	100.73	117500
62.63	2.14323700	45.01	52500
23.86	2.14323700	17.15	20000
26.84	2.14323700	19.29	22500
2.98	2.14323700	2.14	2500
5.97	2.14323700	4.29	5000
5.97	2.14323700	4.29	5000
2.98	2.14323700	2.14	2500
5.97	2.14323700	4.29	5000
5.97	2.14323700	4.29	5000
11.43	4.22955658	8.46	10000
27.83	10.48851530	20.98	25000
16,043	**151**	**6,822**	**5,404,841**

s

Transformer	No-Load Loss (W)	Load Loss (W)
75KVA, 120/208V	221	923
75KVA, 120/208V	207	910.9
75KVA, 277/480V	224	565
75KVA, 277/480V	196	861
150KVA, 120/208V	367	1249
150KVA, 120/208V	291	1445
150KVA, 277/480V	374.2	1263.9
225KVA, 120/208V	455	1634
225KVA, 120/208V	393	2319
300KVA, 120/208V	634	2280
300KVA, 277/480V	571	2262
300KVA, 277/480V	500	2904
500KVA, 120/208V	882	3417
500KVA, 120/208V	968	3841
500KVA, 120/208V	845	3582
500KVA, 277/480V	721	3200
500KVA, 277/480V	816	3888
500KVA, 277/480V	862	2841
750KVA, 120/208V	1225	5744
750KVA, 120/208V	1363	5118
750KVA, 120/208V	1037	5884
750KVA, 277/480V	1261	4718
1000KVA, 277/480V	1251	6236
1000KVA, 277/480V	1389	5855
1500KVA, 277/480V	1789	8939
1500KVA, 277/480V	2329	9345
2000KVA, 277/480V	2561.9	14964.2
2500KVA, 277/480V	2493	15200



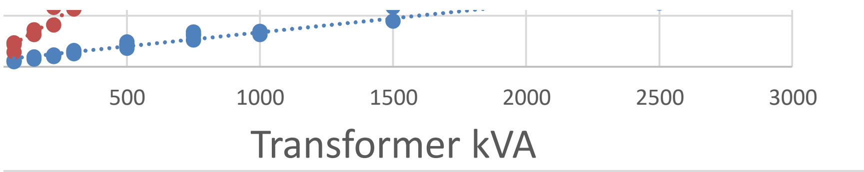

500
1000
1500
2000
2500
3000
Transformer kVA

Exhibit H
Secondary Line Losses

AUSTIN ENERGY
Evaluation of System Losses

Estimated Service Line Losses

Type	MILES OF CONDUCTOR	PERCENT CONDUCTOR PEAK LOADING/CAPACITY (1)	PEAK DEMAND LOSS (kW)	ANNUAL ENERGY LOSSES (kWh)
Service and Secondary Conductor	5,896	31.7%	16,751	47,832,685
Streetlight Conductor	1,626	1.5%	6.8	9,767
TOTAL	7,522		16,758	47,842,452

Notes
(1) Conductor loading percentage is as follows:
Secondary Conductor = (Annual Energy Sales (kWh)-Streetlight Annual Energy Sales (kWh)) / (Time * Load Factor) / Conductor Capacity (kVA)
Streetlight Conductor = (Streetlight Annual Energy Sales (kWh) / (Time * Load Factor)) / Conductor Capacity (kVA)

AUSTIN ENERGY

Evaluation of System Losses

Estimated Secondary Line Losses

WIRE SIZE	MATERIAL	UG/OH	ACTUAL LENGTH (Ft)	QTY	VOLTAGE	Average Length (Ft)	Ohms Per FT	PHASING
#12	CU	OH	2,241	55	120	40.75	0.00031	1-Phase
#2	CU	OH	4,960	74	120	67.03	0.00017	1-Phase
#2	CU	OH	1,461	19	120	76.92	0.00017	3-Phase
#4	ACSR	OH	104	2	120	51.96	0.00042	1-Phase
#4	AL	OH	6,050,656	82,845	120	73.04	0.00042	1-Phase
#4	AL	UG	3,431	48	120	71.48	0.00042	1-Phase
#4	CU	OH	3,882	62	120	62.61	0.00027	1-Phase
#4	CU	OH	511	7	120	72.99	0.00027	3-Phase
#6	CU	OH	341,753	4,539	120	75.29	0.00042	1-Phase
#6	CU	OH	8,662	101	120	85.77	0.00042	3-Phase
#6	CU	UG	80	2	120	39.79	0.00042	1-Phase
#6	TREECABLE	OH	44,087	602	120	73.23	0.00067	1-Phase
#8	CU	OH	67,188	1,223	120	54.94	0.00066	1-Phase
#8	CU	OH	276	5	120	55.17	0.00066	3-Phase
1/0	ACSR	OH	1,744	24	120	72.68	0.00017	1-Phase
1/0	AL	OH	10,187,532	143,364	120	71.06	0.00017	1-Phase
1/0	AL	UG	11,246	153	120	73.50	0.00017	1-Phase
1/0	CU	OH	9,816	137	120	71.65	0.00011	1-Phase
1/0	CU	OH	18,391	242	120	75.99	0.00011	3-Phase
2/0	CU	OH	5,318	72	120	73.86	0.00008	1-Phase
2/0	CU	OH	9,796	139	120	70.48	0.00008	3-Phase
250	CU	UG	147	2	120	73.53	0.00005	1-Phase
250	CU	UG	1,058	17	120	62.23	0.00005	3-Phase
250	CU	OH	2,710	38	120	71.31	0.00005	1-Phase
250	CU	OH	3,710	58	120	63.97	0.00005	3-Phase
350	CU	OH	133	2	120	66.46	0.00003	1-Phase
4/0	AL	OH	895,093	13,016	120	68.77	0.00008	1-Phase
4/0	AL	OH	208	2	120	103.89	0.00008	3-Phase
4/0	CU	OH	23,531	314	120	74.94	0.00005	1-Phase
4/0	CU	OH	66,060	894	120	73.89	0.00005	3-Phase
4/0	AL	UG	991	17	120	58.30	0.00008	1-Phase
4/0	CU	UG	278	5	120	55.67	0.00005	1-Phase
500	CU	UG	104	2	120	52.21	0.00002	3-Phase
500	AL	OH	1,167	12	120	97.28	0.00004	3-Phase
500	CU	OH	8,269	115	120	71.90	0.00002	1-Phase
500	CU	OH	41,436	590	120	70.23	0.00002	3-Phase
750	AL	OH	340	5	120	68.05	0.00002	3-Phase
#2	CU	OH	652	7	240	93.11	0.00017	1-Phase
#4	AL	OH	1,873	34	240	55.08	0.00042	1-Phase
#4	CU	OH	212	2	240	106.16	0.00027	1-Phase
#6	CU	OH	80	2	240	40.08	0.00042	1-Phase
#6	CU	OH	184	2	240	92.01	0.00042	3-Phase

#8	CU	OH	152	2	240	75.92	0.00066	1-Phase
1/0	AL	OH	4,375	74	240	59.13	0.00017	1-Phase
1/0	AL	OH	776	7	240	110.79	0.00017	3-Phase
1/0	CU	OH	837	10	240	83.73	0.00011	1-Phase
1/0	CU	OH	475	10	240	47.49	0.00011	3-Phase
2/0	CU	OH	906	12	240	75.49	0.00008	1-Phase
2/0	CU	OH	249	5	240	49.87	0.00008	3-Phase
250	CU	OH	131	2	240	65.26	0.00005	1-Phase
250	CU	OH	247	5	240	49.37	0.00005	3-Phase
4/0	AL	OH	1,915	36	240	53.19	0.00008	1-Phase
4/0	AL	OH	288	5	240	57.64	0.00008	3-Phase
4/0	CU	OH	1,921	22	240	87.31	0.00005	1-Phase
4/0	CU	OH	1,446	19	240	76.08	0.00005	3-Phase
500	CU	OH	1,269	19	240	66.79	0.00002	1-Phase
500	CU	OH	59	2	240	29.51	0.00002	3-Phase
#2	CU	OH	1,149	19	277	60.46	0.00017	3-Phase
#4	AL	OH	333	7	277	47.55	0.00042	1-Phase
#4	CU	OH	134	2	277	67.23	0.00027	3-Phase
1/0	AL	OH	13,148	235	277	55.95	0.00017	1-Phase
1/0	AL	OH	156	2	277	77.92	0.00017	3-Phase
1/0	CU	OH	192	2	277	95.90	0.00011	1-Phase
1/0	CU	OH	1,462	24	277	60.92	0.00011	3-Phase
2/0	CU	OH	155	2	277	77.41	0.00008	1-Phase
2/0	CU	OH	3,061	46	277	66.55	0.00008	3-Phase
250	CU	OH	1,159	19	277	60.99	0.00005	3-Phase
350	CU	OH	69	2	277	34.68	0.00003	3-Phase
4/0	AL	OH	20,377	343	277	59.41	0.00008	1-Phase
4/0	CU	OH	362	7	277	51.76	0.00005	1-Phase
4/0	CU	OH	7,358	103	277	71.43	0.00005	3-Phase
500	CU	OH	210	2	277	105.00	0.00002	1-Phase
500	CU	OH	4,999	72	277	69.43	0.00002	3-Phase
1/0	AL	OH	28,836	144	120	200.25	0.00017	1-Phase
1/0	AL	UG	443	2	120	221.28	0.00017	1-Phase
1/0	AL	OH	134	2	240	67.10	0.00017	1-Phase
1/0	AL	OH	24	0	277	0.00	0.00017	1-Phase
#12	CU	OH	53	2	120	26.72	0.00031	1-Phase
#2	AL	OH	14	0	120	0.00	0.00027	1-Phase
#2	CU	OH	450,352	4,462	120	100.93	0.00017	1-Phase
#2	CU	OH	111,042	1,163	120	95.48	0.00017	3-Phase
#4	ACSR	OH	1,028,132	9,372	120	109.70	0.00042	1-Phase
#4	ACSR	UG	2,612	22	120	118.74	0.00042	1-Phase
#4	ACSR	OH	23,965	230	120	104.19	0.00042	3-Phase
#4	AL	OH	3,253,222	35,196	120	92.43	0.00042	1-Phase
#4	AL	OH	827	5	120	165.43	0.00042	3-Phase
#4	AL	UG	33,559	348	120	96.43	0.00042	1-Phase
#4	CU	OH	72,908	736	120	99.06	0.00027	1-Phase
#4	CU	OH	9,430	110	120	85.72	0.00027	3-Phase
#6	CU	OH	150,893	1,532	120	98.49	0.00042	1-Phase
#6	CU	OH	27,571	362	120	76.16	0.00042	3-Phase
#6	CU	UG	258	2	120	128.99	0.00042	1-Phase
#6	TREECABLE	OH	3,589	22	120	163.15	0.00067	1-Phase
#6	TREECABLE	OH	154	5	120	30.82	0.00067	3-Phase

#8	CU	OH	3,584	34	120	105.40	0.00066	1-Phase
1/0	ACSR	OH	3,071,477	27,953	120	109.88	0.00017	1-Phase
1/0	ACSR	OH	419,807	3,714	120	113.03	0.00017	3-Phase
1/0	ACSR	UG	350	2	120	174.78	0.00017	1-Phase
1/0	ACSR	UG	374	5	120	74.89	0.00017	3-Phase
1/0	AL	OH	2,998,134	52,936	120	56.64	0.00017	1-Phase
1/0	AL	OH	1,869	34	120	54.97	0.00017	3-Phase
1/0	AL	UG	19,383	201	120	96.43	0.00017	1-Phase
1/0	CU	OH	30,985	372	120	83.29	0.00011	1-Phase
1/0	CU	OH	29,448	398	120	73.99	0.00011	3-Phase
2/0	CU	OH	12,758	141	120	90.48	0.00008	1-Phase
2/0	CU	OH	12,246	206	120	59.44	0.00008	3-Phase
250	CU	OH	31	2	120	15.44	0.00005	1-Phase
250	CU	OH	81	5	120	16.25	0.00005	3-Phase
4/0	AL	OH	1,383,357	19,984	120	69.22	0.00008	1-Phase
4/0	AL	OH	1,325	31	120	42.73	0.00008	3-Phase
4/0	CU	OH	8,283	120	120	69.02	0.00005	1-Phase
4/0	CU	OH	23,272	544	120	42.78	0.00005	3-Phase
4/0	AL	UG	1,894	29	120	65.32	0.00008	1-Phase
500	CU	OH	89	5	120	17.83	0.00002	1-Phase
500	CU	OH	3,098	115	120	26.94	0.00002	3-Phase
#4	AL	OH	1,582	34	240	46.53	0.00042	1-Phase
#4	ACSR	OH	54	2	240	27.24	0.00042	1-Phase
1/0	AL	OH	3,540	46	240	76.95	0.00017	1-Phase
1/0	ACSR	OH	380	7	240	54.31	0.00017	3-Phase
2/0	CU	OH	132	2	240	65.93	0.00008	3-Phase
4/0	AL	OH	1,496	24	240	62.32	0.00008	1-Phase
4/0	CU	OH	195	5	240	38.93	0.00005	3-Phase
500	CU	OH	142	5	240	28.44	0.00002	3-Phase
#4	AL	OH	1,450	12	277	120.84	0.00042	1-Phase
#4	ACSR	OH	14	0	277	0.00	0.00042	1-Phase
#4	CU	OH	294	2	277	146.97	0.00027	3-Phase
1/0	AL	OH	3,588	86	277	41.72	0.00017	1-Phase
1/0	CU	OH	205	5	277	41.01	0.00011	3-Phase
2/0	CU	OH	345	10	277	34.55	0.00008	3-Phase
250	CU	OH	172	2	277	85.98	0.00005	3-Phase
4/0	AL	OH	3,986	101	277	39.47	0.00008	1-Phase
4/0	AL	OH	590	12	277	49.15	0.00008	3-Phase
4/0	CU	OH	1,656	50	277	33.12	0.00005	3-Phase
500	CU	OH	455	22	277	20.66	0.00002	3-Phase
				0		0.00	0.00000	
			31,130,880	410,943		75.7547		
			5,896					

Estimated Streetlight Conductor Line Losses

WIRE SIZE	MATERIAL	UG/OH	ACTUAL LENGTH	QTY	VOLTAGE	Average Length	Ohms Per FT	PHASING
#4	AL	OH	8,977	43	120	208.78	0.00042	1-Phase
1/0	AL	OH	335	2	120	167.34	0.00017	1-Phase
#2	CU	OH	57	1	240	57.28	0.00017	1-Phase
#4	AL	OH	120	2	240	59.83	0.00042	1-Phase
1/0	AL	OH	547	4	240	136.68	0.00017	1-Phase
#4	CU	OH	3,284	21	120	156.37	0.00027	3-Phase
#4	AL	OH	5,776,452	27,668	120	208.78	0.00042	1-Phase
1/0	AL	OH	215,350	1,287	120	167.33	0.00017	1-Phase
#2	CU	OH	36,857	643	240	57.32	0.00017	1-Phase
#4	AL	OH	76,995	1,287	240	59.83	0.00042	1-Phase
1/0	AL	OH	351,786	2,574	240	136.67	0.00017	1-Phase
#4	CU	OH	2,112,977	13,512	120	156.38	0.00027	3-Phase
			8,583,737	47,044		182.462		
			1,626					
			7,522	457,987				

(1) Due to the nature of streetlights the usage time is estimated to be 4,380 hours

Service Voltage LG	Current Rating	Secondary KVA	Total Losses at Peak (kW)	Annual Demand Loss (kW)	Annual kWh Losses
0.12	20	132.0000	0.0280707	0.2182897	80
0.12	191	1,696.0800	3.0340622	23.5941825	8,664
0.12	191	754.2735	0.8939387	6.9516547	2,553
0.12	94	22.5600	0.0390311	0.3035226	111
0.12	94	934,491.6000	2,263.4334556	17,601.4395814	6,463,243
0.12	94	541.4400	1.2834173	9.9804093	3,665
0.12	100	744.0000	1.0344573	8.0443885	2,954
0.12	100	145.4923	0.1361540	1.0587925	389
0.12	94	51,199.9200	126.0780447	980.4375214	360,016
0.12	94	1,973.2908	3.1956860	24.8510391	9,125
0.12	94	22.5600	0.0293565	0.2282885	84
0.12	90	6,501.6000	24.0392465	186.9396001	68,644
0.12	85	12,474.6000	32.1519071	250.0271653	91,810
0.12	85	88.3346	0.1320096	1.0265641	377
0.12	191	550.0800	1.0688450	8.3118016	3,052
0.12	191	3,285,902.8800	6,227.2476760	48,425.7769783	17,781,930
0.12	191	3,506.7600	6.8739607	53.4548976	19,629
0.12	250	4,110.0000	6.4617866	50.2496536	18,452
0.12	250	12,574.6889	12.1064373	94.1449040	34,570
0.12	320	2,764.8000	4.5473420	35.3621020	12,985
0.12	320	9,244.9944	8.3766642	65.1405715	23,920
0.12	340	81.6000	0.0767886	0.5971412	219
0.12	340	1,201.3504	0.5523419	4.2952498	1,577
0.12	340	1,550.4000	1.4147798	11.0019413	4,040
0.12	340	4,098.7250	1.9373277	15.0654996	5,532
0.12	364	87.3600	0.0558162	0.4340511	159
0.12	300	468,576.0000	673.7559665	5,239.4184190	1,923,913
0.12	300	124.7077	0.1563948	1.2161935	447
0.12	350	13,188.0000	15.0987219	117.4142055	43,114
0.12	350	65,035.0437	42.3872922	329.6219557	121,037
0.12	300	612.0000	0.7460424	5.8015491	2,130
0.12	350	210.0000	0.1786057	1.3889155	510
0.12	580	241.1015	0.0779916	0.6064967	223
0.12	550	1,371.7842	1.2592441	9.7924278	3,596
0.12	580	8,004.0000	6.1763640	48.0300832	17,637
0.12	580	71,124.9344	30.9509109	240.6876985	88,380
0.12	847	880.2282	0.5864920	4.5608162	1,675
0.24	191	320.8800	0.3986765	3.1002811	1,138
0.24	94	767.0400	0.7004902	5.4473152	2,000
0.24	100	48.0000	0.0565828	0.4400125	162
0.24	94	45.1200	0.0295687	0.2299393	84
0.24	94	78.1501	0.0678851	0.5279043	194

0.24	85	40.8000	0.0726592	0.5650296	207
0.24	191	3,392.1600	2.6745137	20.7981777	7,637
0.24	191	555.7805	0.4740713	3.6865840	1,354
0.24	250	600.0000	0.5511600	4.2860587	1,574
0.24	250	1,039.2305	0.3125991	2.4309063	893
0.24	320	921.6000	0.7745404	6.0231617	2,212
0.24	320	665.1075	0.2132082	1.6579996	609
0.24	340	163.2000	0.0681508	0.5299701	195
0.24	340	706.6767	0.1288906	1.0023093	368
0.24	300	2,592.0000	1.4412105	11.2074774	4,115
0.24	300	623.5383	0.2169423	1.6870370	619
0.24	350	1,848.0000	1.2325026	9.5844742	3,519
0.24	350	2,764.3531	0.9275037	7.2126706	2,648
0.24	580	2,644.8000	0.9478624	7.3709892	2,707
0.24	580	482.2029	0.0440908	0.3428691	126
0.28	191	1,741.1146	0.7026737	5.4642953	2,006
0.28	94	182.2660	0.1245228	0.9683434	356
0.28	100	95.9556	0.0358307	0.2786348	102
0.28	191	12,433.1450	8.0366137	62.4961912	22,949
0.28	191	183.2752	0.0952598	0.7407814	272
0.28	250	138.5000	0.1262644	0.9818868	361
0.28	250	2,878.6684	0.9624663	7.4845550	2,748
0.28	320	177.2800	0.1323736	1.0293945	378
0.28	320	7,062.3332	2.6175000	20.3548144	7,474
0.28	340	3,099.3664	0.6050323	4.7049934	1,728
0.28	364	349.2784	0.0291263	0.2264989	83
0.28	300	28,503.3000	15.3384903	119.2787487	43,799
0.28	350	678.6500	0.2324644	1.8077435	664
0.28	350	17,295.9996	4.7210062	36.7125905	13,481
0.28	580	321.3200	0.1568608	1.2198174	448
0.28	580	20,035.5324	3.7337127	29.0349683	10,662
0.12	191	3,300.4800	17.6263868	137.0704238	50,332
0.12	191	45.8400	0.2705231	2.1037051	772
0.24	191	91.6800	0.0820260	0.6378697	234
0.28	191	0.0000	0.0000000	0.0000000	0
0.12	20	4.8000	0.0006694	0.0052054	2
0.12	100	0.0000	0.0000000	0.0000000	0
0.12	191	102,269.0400	275.4702605	2,142.1761417	786,606
0.12	191	46,169.4770	67.9219474	528.1905017	193,951
0.12	94	105,716.1600	386.1903478	3,003.1835293	1,102,768
0.12	94	248.1600	0.9812166	7.6303656	2,802
0.12	94	4,493.6326	9.0017082	70.0011845	25,704
0.12	94	397,010.8800	1,216.9676153	9,463.6676416	3,475,056
0.12	94	97.6877	0.3094236	2.4062120	884
0.12	94	3,925.4400	12.5536290	97.6224604	35,847
0.12	100	8,832.0000	19.4291310	151.0893439	55,480
0.12	100	2,286.3071	2.5128879	19.5413052	7,176
0.12	94	17,280.9600	55.6668255	432.8893627	158,957
0.12	94	7,072.5870	10.1712469	79.0960246	29,044
0.12	94	22.5600	0.0951719	0.7400978	272
0.12	90	237.6000	1.9570857	15.2191466	5,588
0.12	90	93.5307	0.0840335	0.6534807	240

0.12	85	346.8000	1.7148518	13.3354305	4,897
0.12	191	640,682.7600	1,881.9420508	14,634.7970690	5,373,893
0.12	191	147,440.6171	257.2221491	2,000.2709178	734,499
0.12	191	45.8400	0.2141833	1.6655818	612
0.12	191	198.4930	0.2294464	1.7842745	655
0.12	191	1,213,293.1200	1,832.6445815	14,251.4385814	5,233,124
0.12	191	1,349.7526	1.1425165	8.8847038	3,262
0.12	191	4,606.9200	11.8481921	92.1366773	33,833
0.12	250	11,160.0000	20.3970078	158.6159731	58,244
0.12	250	20,680.6866	19.3853757	150.7490837	55,355
0.12	320	5,414.4000	10.9092909	84.8353746	31,152
0.12	320	13,701.2147	10.4708200	81.4256347	29,899
0.12	340	81.6000	0.0161238	0.1253860	46
0.12	340	353.3384	0.0424127	0.3298197	121
0.12	300	719,424.0000	1,041.2829306	8,097.4673871	2,973,387
0.12	300	1,932.9687	0.9969851	7.7529881	2,847
0.12	350	5,040.0000	5.3144357	41.3273551	15,175
0.12	350	39,573.8969	14.9321417	116.1188055	42,639
0.12	300	1,044.0000	1.4259247	11.0886087	4,072
0.12	580	348.0000	0.0666018	0.5179245	190
0.12	580	13,863.3347	2.3138532	17.9935250	6,607
0.24	94	767.0400	0.5917695	4.6018560	1,690
0.24	94	45.1200	0.0204611	0.1591148	58
0.24	191	2,108.6400	2.1636575	16.8255382	6,178
0.24	191	555.7805	0.2329280	1.8113488	665
0.24	320	266.0430	0.1127544	0.8768267	322
0.24	300	1,728.0000	1.1258222	8.7548812	3,215
0.24	350	727.4613	0.1248856	0.9711642	357
0.24	580	1,205.5074	0.1062155	0.8259775	303
0.28	94	312.4560	0.5424330	4.2181942	1,549
0.28	94	0.0000	0.0000000	0.0000000	0
0.28	100	95.9556	0.0783317	0.6091411	224
0.28	191	4,550.0020	2.1933199	17.0562061	6,263
0.28	250	599.7226	0.1349767	1.0496370	385
0.28	320	1,535.2898	0.2953959	2.2971265	844
0.28	340	326.2491	0.0897828	0.6981898	256
0.28	300	8,393.1000	3.0006104	23.3340468	8,568
0.28	300	1,727.2011	0.4439908	3.4526648	1,268
0.28	350	8,396.1163	1.0624518	8.2620855	3,034
0.28	580	6,121.9682	0.3395456	2.6404541	970
0.00	0	0	0	0	0
		8,660,546			47,832,685

Service Voltage LG	Current Rating	Secondary KVA	Total Losses at Peak (kW)	Annual Demand Loss (kW)	Annual kWh Losses (1)
0.12	94	485	0.00734733	0.0571360	10.490165
0.12	191	46	0.00044758	0.0034806	0.639038
0.24	191	46	0.00007666	0.0005961	0.109445
0.24	94	45	0.00009793	0.0007616	0.139825
0.24	191	183	0.00073115	0.0056858	1.043908
0.12	100	436	0.00191459	0.0148887	2.733560
0.12	94	312,095	4.72763286	36.7641222	6,749.886846
0.12	191	29,498	0.28799730	2.2395918	411.188694
0.24	191	29,475	0.04932382	0.3835634	70.422178
0.24	94	29,035	0.06301526	0.4900340	89.970160
0.24	191	117,992	0.47046099	3.6585086	671.701574
0.12	100	280,842	1.23194137	9.5801100	1,758.906638
		800,178			9,767

WIRE SIZE	MATERIAL	Resistance OHM Per Mile @ 25C	Conductor Rating adjusted
#8	CU	3.49	85
#6	AL	3.5471	90
#6	TREECABLE	3.5471	90
#4	ACSR	2.24	94
#6	CU	2.2	94
#4	AL	2.2308	94
#2	ACSR	1.4031	100
#2	AL	1.4031	100
#4	CU	1.4042	100
1/0	AL	0.8829	191
1/0	ACSR	0.885	191
1/0	TREECABLE	0.885	191
#2	CU	0.8835	191
2/0	AL	0.7	250
1/0	CU	0.555	250
3/0	AL	0.5543	280
4/0	AL	0.4407	300
250	AL	0.3733	310
4/0	ACSR	0.441	316
2/0	CU	0.44	320
3/0	CU	0.349	340
300	AL	0.3113	340
250	CU	0.238	340
4/0	CU	0.276	350
300	CU	0.1988	350
336	ACSR	0.279548	372
350	CU	0.167	364
350	AL	0.2672	385
400	CU	0.15	500
400	AL	0.2355	530
500	AL	0.1879	550
500	CU	0.117	580
600	AL	0.1571	650
750	CU	0.078	802
700	AL	0.1353	812
600	CU	0.1009	825
750	AL	0.1266	847
795	AL	0.121146	848
795	ACSR	0.121146	848
795	TREECABLE	0.121146	848
1000	AL	0.0963	850
700	CU	0.0881	850
1000	CU	0.064	900

#12	AL	13.7	20
#8	AL	0.6532	40
#10	CU	1.039	30
#12	CU	1.65	20

SECURITY & STREET LIGHT SIZES	ASSUMED USAGE (WATTS)	NUMBER OF LIGHTS	Peak Demand (kW)
30 Watt	33	1	0.033
51 Watt	56	17	0.9537
70 Watt	77	64	4.928
75 Watt	83	8,829	728.3925
80 Watt	88	26	2.288
100 Watt	110	30,194	3321.34
150 Watt	165	521	85.965
175 Watt	193	2,197	422.9225
250 Watt	275	18,157	4993.175
400 Watt	440	4,937	2172.28
1000 Watt	1,100	87	95.7
1500 Watt	1,650	12	19.8
	4,269	65,042	11847.7777

ADMS Length	ADMS Quantity
935	23
2,069	31
610	8
43	1
2,523,675	34,554
1,431	20
1,619	26
213	3
142,542	1,893
3,613	42
33	1
18,388	251
28,024	510
115	2
728	10
4,249,129	59,796
4,690	64
4,094	57
7,671	101
2,218	30
4,086	58
61	1
441	7
1,130	16
1,548	24
55	1
373,335	5,429
87	1
9,815	131
27,553	373
413	7
116	2
44	1
487	5
3,449	48
17,283	246
142	2
272	3
781	14
89	1
33	1
77	1

63	1
1,825	31
323	3
349	4
198	4
378	5
104	2
54	1
103	2
799	15
120	2
801	9
603	8
529	8
25	1
479	8
139	3
56	1
5,484	98
65	1
80	1
610	10
65	1
1,277	19
483	8
29	1
8,499	143
151	3
3,069	43
88	1
2,085	30
12,027	60
185	1
56	1
10	0
22	1
6	0
187,838	1,861
46,315	485
428,825	3,909
1,090	9
9,995	96
1,356,890	14,680
345	2
13,997	145
30,409	307
3,933	46
62,936	639
11,499	151
108	1
1,497	9
64	2

1,495	14
1,281,086	11,659
175,098	1,549
146	1
156	2
1,250,495	22,079
780	14
8,085	84
12,923	155
12,282	166
5,321	59
5,108	86
13	1
34	2
576,986	8,335
552	13
3,455	50
9,706	227
790	12
37	2
1,292	48
660	14
23	1
1,476	19
159	3
55	1
624	10
81	2
59	2
605	5
6	0
123	1
1,497	36
86	2
144	4
72	1
1,663	42
246	5
691	21
190	9
12,984,413	171,403
2459.2	

From GIS

OH Primary – 2379 miles
UG Primary – 3424 miles
OH Secondary – 2525 miles
UG Secondary – 3371 miles

Secondary Total (Non-Streetlight)
5896 miles

Streetlights % from 2011
21.6% miles

Mileage used in calculations

5896	Secondary
1626	Streetlight
7522	Total

Exhibit I
Security and Streetlight Losses

AUSTIN ENERGY
Evaluation of T&D System Losses

Estimated Street & Security Light Losses

SECURITY & STREET LIGHT SIZES	ASSUMED USAGE (WATTS)	NUMBER OF LIGHTS FROM GIS	ASSUMED DEMAND (kW)	ANNUAL ENERGY CONSUMPTION (kWh)
30 Watt	33	1	0.0	120
51 Watt	56	17	1.0	3,481
70 Watt	77	64	4.9	17,987
75 Watt	83	8,829	728.4	2,658,633
80 Watt	88	26	2.3	8,351
100 Watt	110	30,194	3,321.3	12,122,891
150 Watt	165	521	86.0	313,772
175 Watt	193	2,197	422.9	1,543,667
250 Watt	275	18,157	4,993.2	18,225,089
400 Watt	440	4,937	2,172.3	7,928,822
1000 Watt	1,100	87	95.7	349,305
1500 Watt	1,650	12	19.8	72,270
TOTALS		65,042	11,847.8	43,244,389
TOTAL BILLED kWh				49,962,729
UNACCOUNTED FOR LIGHT CONSUMPTION				6,718,340

Notes:
(1) Estimated 10 hours of operation per day

Exhibit J
System Loss Graphics

AUSTIN ENERGY
Evaluation of T&D System Losses

T&D Energy Losses by Voltage

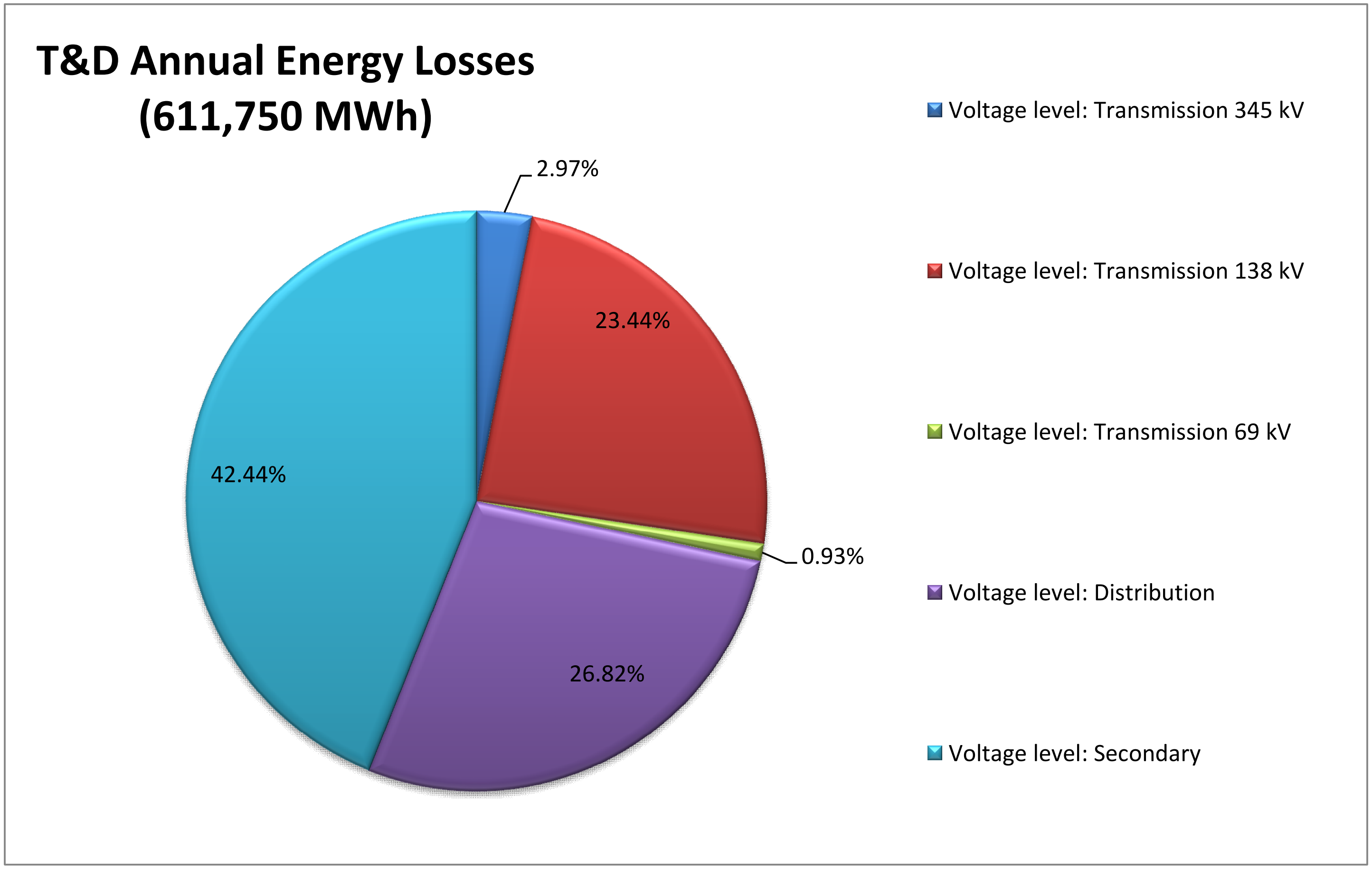


Exhibit J
System Loss Graphics

AUSTIN ENERGY
Evaluation of T&D System Losses

T&D Energy Losses by Equipment Type

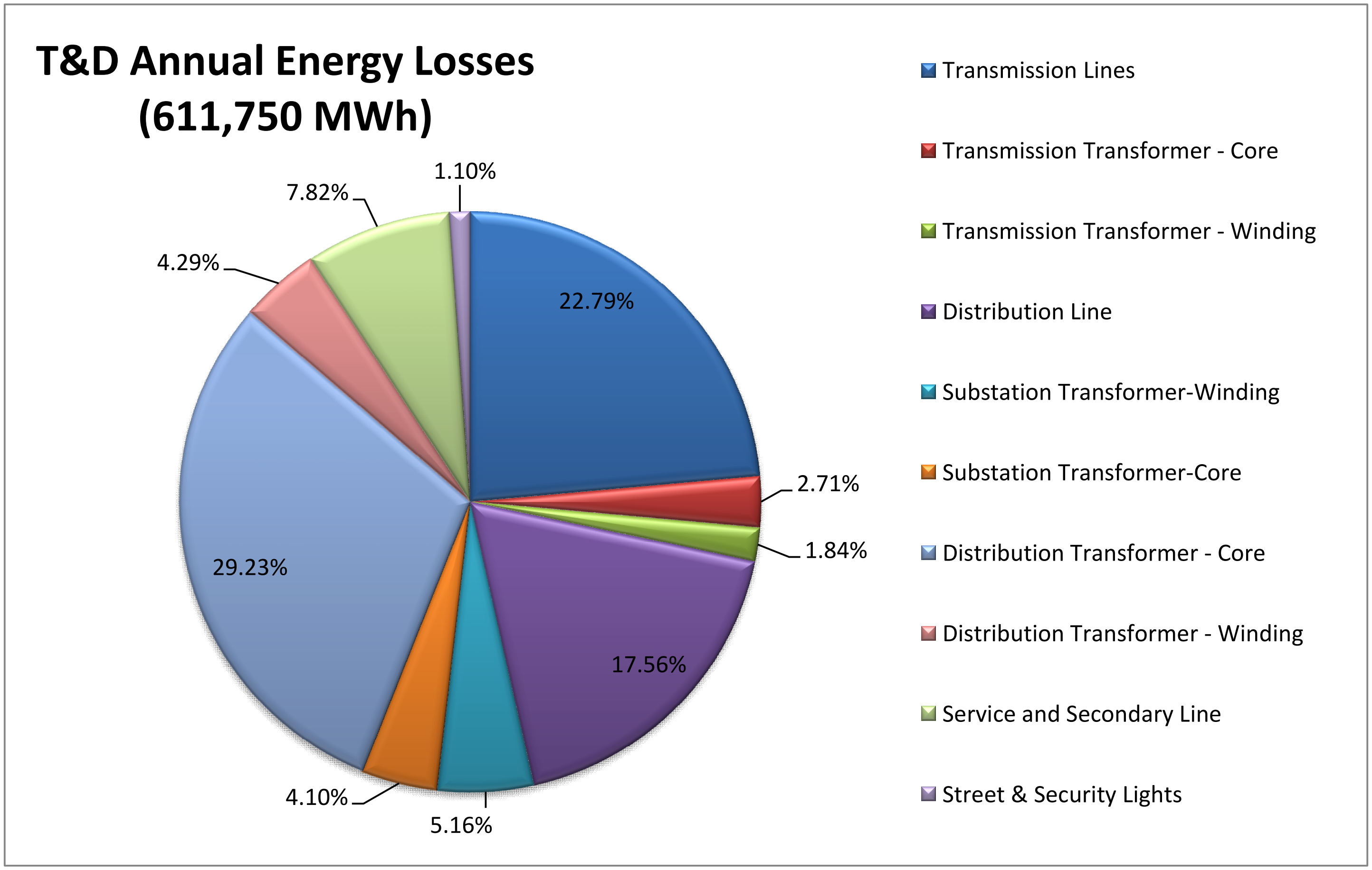


Exhibit J
System Loss Graphics

AUSTIN ENERGY
Evaluation of T&D System Losses

T&D Demand Losses by Voltage

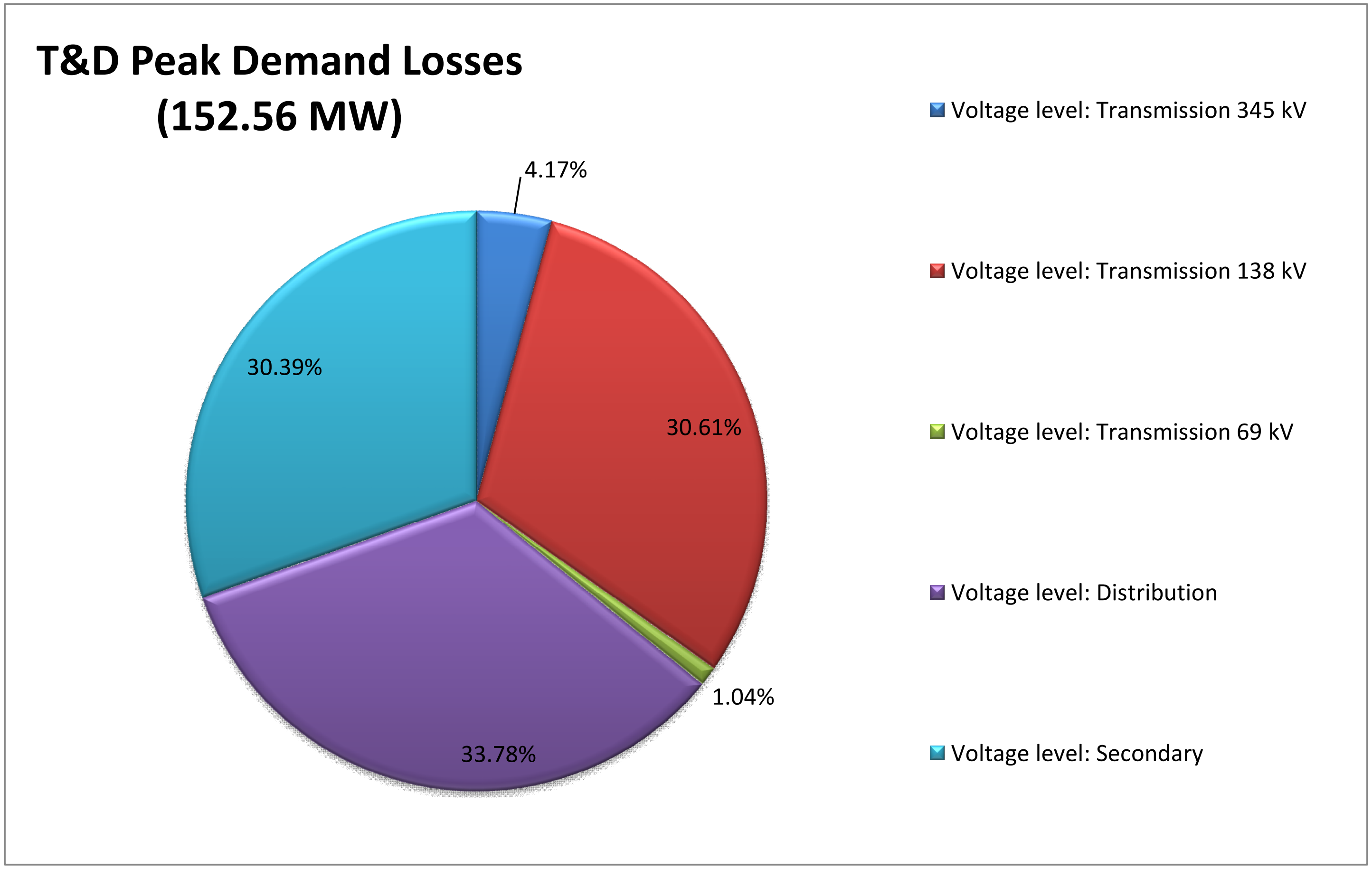


Exhibit J
System Loss Graphics

AUSTIN ENERGY
Evaluation of T&D System Losses

T&D Demand Losses by Equipment Type

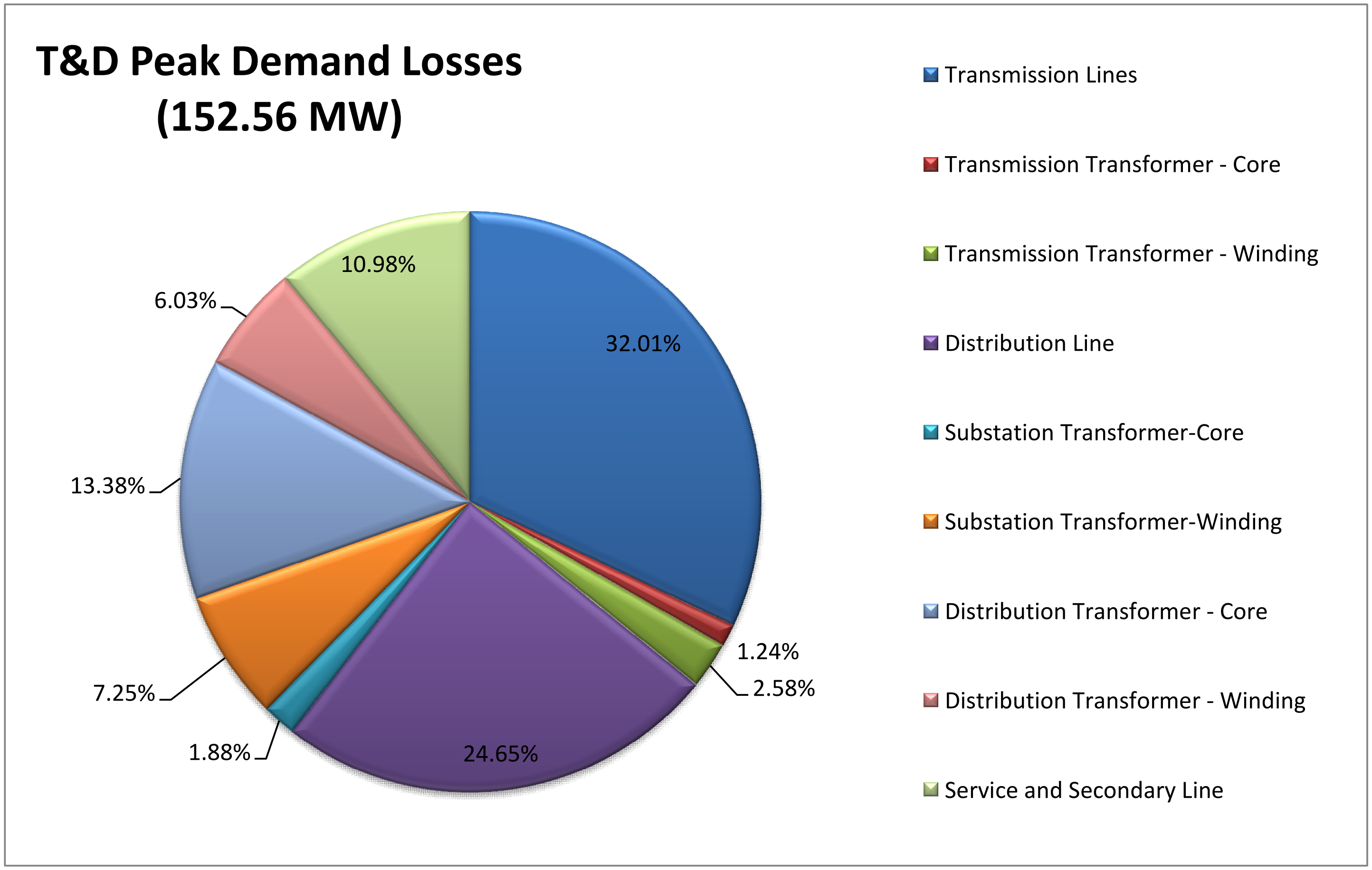


Exhibit
Load Factor Calculations

AUSTIN ENERGY

05/31/22

Load & Demand Factor Calculations

All information in BLUE text requires input data.

LOAD FACTOR CALCULATION (1)

Month	2018	Percent of Peak	Percent of Peak Squared
October	2,322,000	80.68%	0.65
November	1,961,000	68.14%	0.46
December	2,009,000	69.81%	0.49
January	2,381,000	82.73%	0.68
February	2,021,000	70.22%	0.49
March	1,825,000	63.41%	0.40
April	1,857,000	64.52%	0.42
May	2,532,000	87.98%	0.77
June	2,563,000	89.05%	0.79
July	2,878,000	100.00%	1.00
August	2,744,000	95.34%	0.91
September	2,411,000	83.77%	0.70
System Peak	2,878,000	100.00%	7.78
Ann. MWh Prod.	13,950,713		
Ann. Load Factor	55.34%		

From Zoe's email 13,950,713

Notes : (1) MWh Produced and Peak Loading provided by Austin Energy

Austin Energy System Loss Study for Fiscal Year 2018

For Preparation of a 2019 Rate Study

Final Report – Version 2.0

Prepared by
Austin Energy

Nov. 6, 2019

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TABLE OF CONTENTS

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1 INTRODUCTION

This report presents the Austin Energy's fiscal year 2018 transmission and distribution system loss study for the preparation of a rate study. It provides a summary of the basis of loss calculations, methodologies used and the results.

The electric system, for the purposes of this study, is defined as the transmission and distribution system equipment required to distribute electrical power to each Austin Energy customer. Information about the Austin Energy power system configuration, equipment types and ratings, primary and secondary circuit types and lengths, historical data, and transformer loads was gathered to perform this analysis. The Austin Energy power system evaluated can be characterized by the following statistics and principal types of equipment as of Fiscal Year 2018:

Type	Quantity	Location of Loss Calculations
System Peak Demand	2,878 MW (1)	
Annual Net Energy for Load	13,950,713 MWh (2)	
Annual Energy Sales	13,338,963 MWh (2)	
Annual Losses	4.39 %	Exhibit A
Circuit-miles of Transmission		Exhibit B
345 kV	276.2 mi.	
138 kV	321.5 mi.	
69 kV	26.1 mi.	
Transmission Transformers	19	Exhibit C
Substation Transformers	168	Exhibit D
Circuit-miles of Distribution Operating at 12.5 kV	5,803 mi.	Exhibit E
Distribution Transformers	84,377	Exhibit F
Circuit-miles of Secondary Operating at 1.0 kV & below	7,522 mi.	Exhibit H
Street & Security Lights	65,042	Exhibit I

Notes:
(1) Peak Demand on July 23, 2018
(2) Based on Fiscal Year 2018

2 ANALYSIS SUMMARY

The calculated transmission and distribution system losses for fiscal year 2018 are summarized in the table below. Additional details of the loss calculations are included in Exhibits A through J. Charts illustrating the calculated losses by voltage level are given in Figure 1 and Figure 2.

Type	Annual Energy Losses (MWh)	Demand Losses at Peak (MW)
Transmission 345 kV	18,183	6.37
Transmission 138 kV	143,383	46.70
Transmission 69 kV	5,710	1.59
Distribution	164,047	51.53
Secondary	259,656	46.06
Non-Technical	20,771	0
TOTALS	611,750	152.25

Note: Lights were assumed to be off during the 2018 system peak.

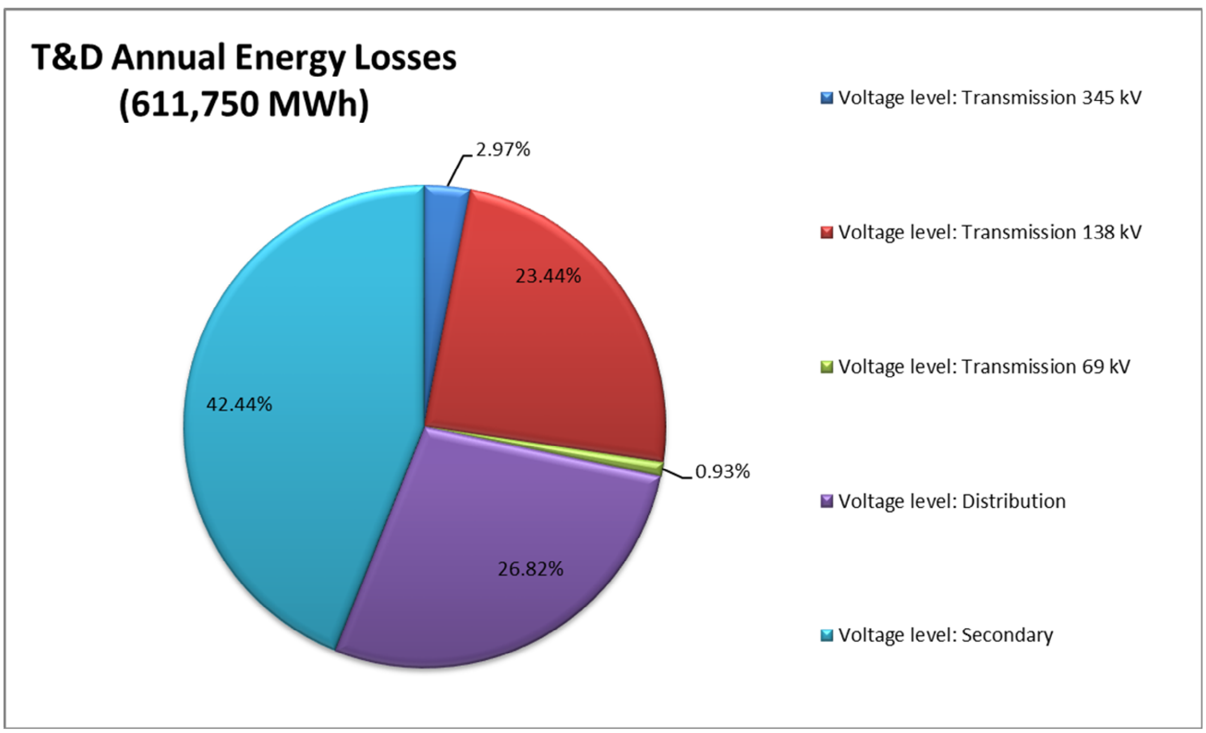


Figure 1. Calculated Annual Energy Losses by Voltage Level

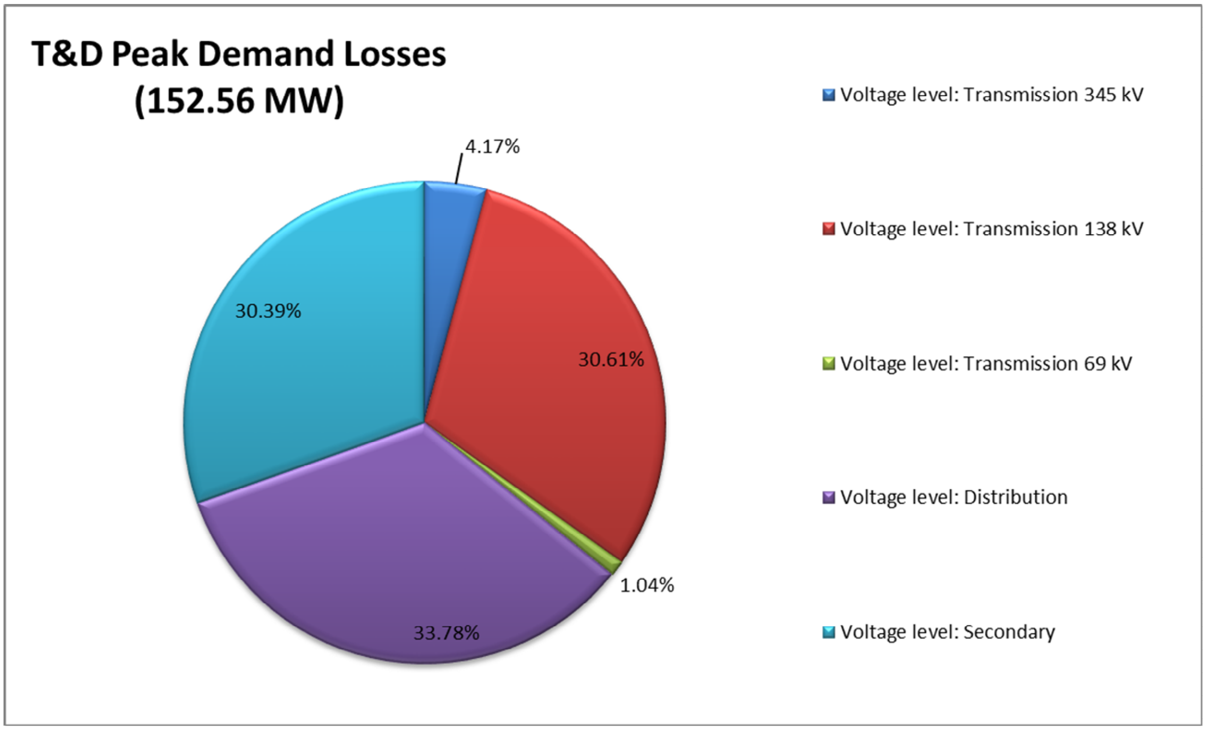


Figure 2. Calculated Demand Losses at Peak by Voltage Level

3 BASIS OF ANALYSIS

System losses can be categorized as technical and non-technical losses. Non-technical losses can be attributed to unmetered loads (such as station service), loose hardware, corona or other mechanical abnormalities, metering inaccuracies, theft, etc. For the purposes of this study, the non-technical losses were estimated based on the total system losses, which are calculated from the annual energy sales and purchases, less the calculated technical losses.

Technical system losses are an unavoidable result of delivering power to electric utility customers, due to the physics of power flow and voltage transformation. In addition, losses can be broken into two groups: 1) constant losses, which are independent of the system loading; and 2) variable losses, which are dependent on system loading.

Constant losses consist primarily of transformer core losses, or no-load losses. The constant system losses included in this study were based on the name plate losses and the assumed time period of one year.

Variable losses include transmission and distribution line losses for the primary and secondary systems, and transformer winding, or load losses. The variable losses included in this study were based on the calculated losses at peak, the assumed time period of one year, and the Loss Factor.

The equation for the Loss Factor is as follows:

$$\text{Loss Factor} = k * \text{Load Factor} + (1 - k) * \text{Load Factor}^2$$

A value of 0.08 was assumed for the constant coefficient "k" for the Loss Factor calculations based on research published[1] in IEEE Transactions on Power Systems on November 1988 using American and Canadian utilities. The average annual Load Factor for the fiscal year 2018 of 55.34% was calculated based on the Austin Energy monthly system peak and energy purchases.

4 TRANSMISSION & DISTRIBUTION SYSTEM

Losses for the transmission and distribution systems were taken from the load flow results from the existing engineering models. The load flow results were based on the 2018 system peak, recorded in July. The transmission system is modeled in PTI Interactive Power System Simulator (PSSE™). The distribution system is modeled in FeederALL®.

The load flow results at the 2018 system peak provided data for transmission and distribution line losses, and substation transformer load losses. Substation transformer no-load losses were obtained from Austin Energy manufacturer test report summaries. If test reports were not available for a given transformer, impedances and no-load loss values were assumed based on similar sized transformers. The transmission and distribution line losses are presented in Exhibit B and Exhibit E, respectively. Transmission substation transformer load and no-load losses are presented in Exhibit C, while the distribution substation transformer losses are presented in Exhibit D.

5 DISTRIBUTION TRANSFORMERS

Inventory of the installed distribution transformer capacities and configurations was obtained from the existing GIS system. Distribution transformer specifications were based on a number of manufacturer test reports and Austin Energy distribution transformer inspection report. If test reports were not available for a given transformer, the load loss and no-load loss values were assumed using regression method. A summary of the test reports and the regression equations used in the loss calculations are given in Exhibit G.

Loading for the distribution transformers was estimated using the total installed distribution transformer capacity and the estimated customer demand at the 2018 peak. Distribution transformer no-load and load losses are listed in Exhibit F.

[1] M.W. Gustafson and J.S. Baylor, "The Equivalent Hours Loss Factor Revisited", IEEE Trans. On Power Systems, Vol. 3, No. 4. pp 1502-1508, November 1988.

6 SECONDARY SYSTEM

The ADMS database and GIS system together provided information related to the installed secondary conductor types and lengths for each of the following categories: service, secondary, and street lights. Losses in the secondary system were estimated based on the service category, average lengths, conductor types, and the estimated conductor loading.

The conductor loading was estimated based on the total service conductor capacity and the estimated customer demand at the 2018 peak. Secondary lines were assumed to be sized similar to service lines. Conductor loading for the secondary serving security and street lights was calculated based on the estimated lighting load, as provided by Austin Energy, and the total conductor capacity. Secondary line losses are presented in Exhibit H.

7 SECURITY AND STREET LIGHTS

Total consumption estimates for security and street lights were provided by Austin Energy, which accounted for the light, the ballast, and other miscellaneous losses associated with each lamp size. The quantity of lights by size and type were also provided by Austin Energy based on information included in the existing GIS system and the operation time of lights per day was assumed to be 10 hours. The actual energy consumption of lights was the product of the total power of all lights and the annual operation time. Therefore, the losses for security and street lights were calculated based on the difference in the estimated annual energy consumption and the total billed energy derived from the GIS data. Security and street light losses are presented in Exhibit I.

EXHIBIT A: SYSTEM LOSS SUMMARY

AUSTIN ENERGY

Evaluation of T&D System Losses

Summary of T&D System Losses

SYSTEM LOSSES

	Austin Energy
2018 Annual Net Available for Sale (MWh)	13,950,713
2018 Annual Energy Sales (MWh)	13,338,963
ANNUAL SYSTEM LOSSES (MWh)	**611,750**
PERCENT SYSTEM LOSSES	**4.39%**

TYPE	ANNUAL ENERGY LOSSES (MWh)(2)	PERCENT OF AE ENERGY AVAILABLE	PERCENT OF TOTAL AE LOSSES	DEMAND LOSSES AT PEAK (MW)	PERCENT OF DEMAND AE LOSSES AT PEAK
Voltage Level: Transmission 345 kV	18,183	**0.13%**	2.97%	6.37	4.17%
Transmission Line Losses	18,183	**0.13%**	2.97%	6.37	4.17%
Transmission Substation Transformer Losses					
Core	0	**0.00%**	0.00%	0.00	0.00%
Winding	0	**0.00%**	0.00%	0.00	0.00%
Voltage Level: Transmission 138 kV	143,383	**1.03%**	23.44%	46.70	30.61%
Transmission Line Losses	117,828	**0.84%**	19.26%	41.26	27.05%
Transmission Substation Transformer Losses					
Core	14,863	**0.11%**	2.43%	1.70	1.11%
Winding	10,692	**0.08%**	1.75%	3.74	2.45%
Voltage Level: Transmission 69 kV	5,710	**0.04%**	0.93%	1.59	1.04%
Transmission Line Losses	3,425	**0.02%**	0.56%	1.20	0.79%
Transmission Substation Transformer Losses					
Core	1,743	**0.01%**	0.28%	0.20	0.13%
Winding	541	**0.00%**	0.09%	0.19	0.12%
Voltage Level: Distribution	164,047	**1.18%**	26.82%	51.53	33.78%
Distribution Line Losses	107,401	**0.77%**	17.56%	37.61	24.65%
Distribution Substation Transformer Losses					
Core	25,076	**0.18%**	4.10%	2.86	1.88%
Winding	31,570	**0.23%**	5.16%	11.06	7.25%
Voltage Level: Secondary	259,656	**1.86%**	42.44%	46.37	30.39%
Distribution Transformer Losses					
Core	178,834	**1.28%**	29.23%	20.41	13.38%
Winding	26,261	**0.19%**	4.29%	9.20	6.03%
Service and Secondary Line Losses	47,842	**0.34%**	7.82%	16.76	10.98%
Street & Security Lights(1)(3)	6,718	**0.05%**	1.10%	0.00	0.00%
Loose Hardware, Corona or Other Mechanical Abnormalities and Metering Inaccuracies	20,771	**0.15%**	3.40%	0.00	0.00%
TOTALS	611,750	**4.39%**	100.00%	152.56	100.00%

Notes:
(1) Street and Security Light losses are the difference in billed kWh and total kWh for all lights
(2) Annual Energy Losses were determined using the following equations:
Annual Energy Losses = Peak Demand (kW) * Time (hrs) * Loss Factor
Loss Factor = k * Load Factor + (1 - k) * (Load Factor)^2

"k" constant	0.08
Load Factor	55.34%

(3) Street and Security Light were off at the recorded peak
(4) GSU's results are categorized by the high side voltage, all other transformer results are categorized by low side voltage

EXHIBIT B: TRANSMISSION LINE LOSSES

AUSTIN ENERGY

Evaluation of T&D System Losses

Estimated Transmission Line Losses

TRANSMISSION VOLTAGE (kV)	MILES OF LINE [1]	DEMAND LOSSES AT 2018 PEAK (MW) [2]	ANNUAL ENERGY LOSSES (MWh)
69	26.1	1,200	3,425,488
138	321.5	41,263	117,827,671
345	276.2	6,368	18,182,883
TOTALS	623.8	48,831	139,436,042

Notes:
(1) Transmission line length from AE Transmission Line Database
(2) Peak losses extracted from PSS/E system model

EXHIBIT C: TRANSMISSION TRANSFORMER LOSSES

AUSTIN ENERGY

Evaluation of T&D System Losses

Estimated Transmission Substation Transformer Losses

SUBSTATION NAME	TRANSFORMER VOTLAGE	TRANSFORMER BASE RATING (MVA)	TRANSFORMER NO-LOAD LOSSES (kW) (1)	ANNUAL (2) NO-LOAD ENERGY LOSSES (kWh)	TRANSFORMER LOAD LOSSES (kW) (3)	ANNUAL (4) LOAD ENERGY LOSSES (kWh)
NL AT1	138/69 kV	220	35.6	311,462	33.72	96,282
KB AT1	138/69 kV	220	51.8	453,768	80.95	231,144
MC-AT1 (McNeil)	138/69 kV	220	61.6	539,861	41.38	118,149
PE-AT1	138/69 kV	220	50.0	437,912	33.59	95,908
DL AT1	345/138 kV	672	146.7	1,285,092	390.11	1,113,958
GF AT1	345/138 kV	480	90.0	788,400	165.56	472,757
GF AT2	345/138 kV	480	91.7	803,292	196.67	561,595
LY AT1	345/138 kV	480	124.9	1,093,861	176.09	502,831
LY AT2	345/138 kV	480	98.1	859,356	333.57	952,519
AU AT1	345/138 kV	480	118.0	1,033,855	153.15	437,309
AU AT2	345/138 kV	480	121.2	1,061,975	133.08	380,016
DP MT1	22.8/138 kV	420	219.5	1,922,470	545.17	1,556,721
DP MT2	22.8/138 kV	470	232.6	2,037,313	784.52	2,240,188
DP MPT1(5)	13.8/138 kV	139	51.0	446,760	0.49	1,408
DP MPT2(5)	13.8/138 kV	139	51.0	446,760	65.09	185,850
SH GSU1(6)	13.8/138 kV	130	52.0	455,520	280.59	801,229
SH GSU2(7)	13.8/138 kV	130	50.0	438,000	93.98	268,349
SH GSU3(8)	13.8/138 kV	150	50.8	445,008	278.58	795,481
SH MPT5(9)	18.0/138 kV	480	199.2	1,744,992	147.81	422,072
345 kV TOTALS		0	0.0	0	0	0
138 kV TOTALS(10)		5,610	1,697	14,862,654	3,744	10,692,283
69 kV TOTALS(10)		880	199.0	1,743,003	190	541,483
TOTALS		6,490	1,895.6	16,605,657	3,934	11,233,766

Notes:
(1) From Austin Energy test reports
(2) Annual No-Load Energy Losses is based on calculated demand losses times 8760 hours.
(3) Calculated in PSS/E model with 2018 peak load flows
(4) Annual Load Energy Losses is based on transformer load losses, 8760 hours, and a loss factor calculated from the annual load factor
(5) No-Load Demand Losses are estimated to be the same as Sandhill Transformers of similar size
(6) Losses for SANDH_G1 and SANDH_G2
(7) Losses for SANDH_G3 and SANDH_G4
(8) Losses for SANDH_G6 and SANDH_G7
(9) Losses for SANDHG5A and SANDHG5C
(10) GSU's results are categorized by the high side voltage, all other transformer results are categorized by low side voltage

EXHIBIT D: SUBSTATION TRANSFORMER LOSSES

AUSTIN ENERGY
Evaluation of T&D System Losses

Estimated Distribution Substation Transformer Losses

SUBSTATION NAME	TRANSFORMER BASE RATING (MVA)	2018 COINCIDENT PEAK LOAD (kW)	TRANSFORMER NO-LOAD LOSSES (kW) (1)(7)	ANNUAL (2) NO-LOAD ENERGY LOSSES (kWh)	TRANSFORMER LOAD LOSSES (kW) (3)	ANNUAL (4) LOAD ENERGY LOSSES (kWh)
AD123	30	11,052	16.8	147,168	25.2	72,019
AD456	30	13,802	16.8	147,076	40.0	114,354
AG123	30	14,251	14.8	130,060	25.7	73,248
AG456	30	22,130	14.7	128,588	102.4	292,362
BAL TX1(5)(6)	25	17	14.7	128,772	14.1	40,147
BAL TX2(5)(6)	25	9,623	14.7	128,772	14.1	40,147
BA012	30	19,789	13.6	119,206	91.0	259,741
BA123	30	15,117	9.9	86,461	57.9	165,235
BA456	30	18,464	34.2	299,855	81.8	233,596
BA789	30	11,645	16.2	141,557	25.2	71,869
BC123	30	11,365	27.6	241,999	40.8	116,363
BC456	30	11,365	19.9	174,210	24.4	69,680
BC789	30	13,323	12.9	113,319	39.1	111,656
BE123	30	10,341	14.5	127,024	19.0	54,209
BE456	30	12,767	11.2	98,051	38.4	109,617
BL123	30	26,539	14.6	127,852	148.5	424,107
BL456	30	16,673	17.1	149,927	51.4	146,886
BL789	30	23,995	13.3	116,079	126.7	361,832
BR123	70	19,298	52.1	456,221	35.8	102,181
BR456	70	18,465	53.3	466,523	59.6	170,272
BR789	70	19,588	27.8	243,747	29.6	84,551
BU123	30	22,293	14.0	123,069	117.0	334,128
BU456	30	15,192	13.8	121,046	51.0	145,506
BU789	30	25,725	30.5	266,742	313.2	894,447
BW123	50	2,329	21.6	189,479	0.5	1,529
BW456	50	1,166	22.2	194,078	0.1	300
CC123	30	22,405	15.1	132,451	101.4	289,424
CC456	30	8,256	10.6	92,716	16.7	47,733
CC789	30	5,716	12.9	113,227	5.5	15,741
CA123	30	19,178	13.7	120,402	74.8	213,477
CA456	30	24,965	13.6	119,390	127.9	365,130
CF123	30	20,310	16.6	145,788	86.2	246,099
CF456	30	22,232	12.6	110,376	101.2	289,034
CF789	30	15,561	13.4	117,275	52.7	150,454
CL012	30	20,203	14.3	125,277	49.2	140,529
CL123	30	20,490	15.0	131,163	52.9	151,023
CL456	30	25,077	14.6	127,852	130.1	371,457
CL789	30	15,582	14.2	124,633	31.7	90,578
CM123	30	17,541	9.7	84,990	72.7	207,511
CM456	30	6,113	11.0	96,487	8.5	24,196
CM789	30	18,263	13.9	121,874	70.2	200,465
CM101112	30	7,822	14.4	126,564	7.8	22,307
DE123	30	9,870	14.3	125,001	28.9	82,603
DE456	50	24,045	19.4	170,163	78.1	223,102
DE789	50	24,144	19.5	170,991	62.4	178,278
DE101112	50	17,554	20.5	180,005	23.6	67,371
DE131415	50	17,504	19.9	174,302	32.8	93,756
DE161718	67	22,572	27.2	237,860	29.7	84,701

EXHIBIT D: SUBSTATION TRANSFORMER LOSSES (PAGE 2)

AUSTIN ENERGY
Evaluation of T&D System Losses

Estimated Distribution Substation Transformer Losses

SUBSTATION NAME	TRANSFORMER BASE RATING (MVA)	2018 COINCIDENT PEAK LOAD (kW)	TRANSFORMER NO-LOAD LOSSES (kW) (1)(7)	ANNUAL (2) NO-LOAD ENERGY LOSSES (kWh)	TRANSFORMER LOAD LOSSES (kW) (3)	ANNUAL (4) LOAD ENERGY LOSSES (kWh)
DE192021	67	22,503	26.8	235,009	33.6	95,885
DE222324	30	26,627	15.1	132,175	101.0	288,494
DE2526	30	15,176	15.1	132,175	31.7	90,398
DG123	30	9,219	15.0	130,980	10.7	30,672
DG456	30	17,420	14.1	123,621	64.3	183,615
DL123	30	10,896	18.8	164,552	22.9	65,332
EB012	50	4,861	21.7	190,215	6.0	17,180
EB123	50	(41)	24.2	211,922	0.0	0
EB456	50	4,788	23.1	202,356	6.0	17,240
EB789	50	24,792	23.1	202,356	139.9	399,401
ER123	30	1,924	12.8	111,940	0.5	1,379
FI123	30	22,435	13.5	118,286	99.7	284,717
FI456	30	15,751	14.6	127,852	50.7	144,877
FV123	30	20,374	14.9	130,244	77.4	221,003
FV456	30	18,802	18.9	165,288	61.3	174,920
GR123	30	5,074	16.0	139,994	3.6	10,164
GR456	30	3,757	13.1	114,791	2.8	7,945
GR789	30	25,891	37.9	332,048	154.0	439,758
HC012	30	25,453	12.7	111,572	151.9	433,761
HC123	30	28,272	34.1	298,567	207.2	591,680
HC456	30	23,745	30.2	264,902	124.7	356,046
HC789	30	25,512	12.1	105,777	145.9	416,611
HL123	30	21,273	16.9	147,904	86.1	245,859
HL456	30	24,687	14.9	130,612	127.1	363,002
HM012	30	17,031	14.4	126,105	29.9	85,511
HM123	30	18,561	30.4	266,006	71.7	204,722
HM456	30	23,350	26.8	234,825	170.9	488,090
HM789	30	14,621	14.0	122,241	41.2	117,652
HV123	30	21,757	13.7	120,402	107.7	307,533
HV456	30	27,606	9.6	83,794	169.2	483,233
JE123	30	21,825	30.1	263,983	122.6	350,169
JE456	30	16,779	14.0	122,885	54.4	155,281
JV123	30	25,822	16.0	140,361	142.2	405,997
JV456	30	17,939	9.9	86,369	75.1	214,317
JV789	30	18,370	13.7	119,942	74.4	212,308
JL123	30	17,607	17.7	155,354	42.3	120,831
JL456	30	6,416	17.9	156,550	5.3	14,991
KB123	30	16,478	17.4	152,227	54.7	156,210
KB456	30	22,108	14.5	126,932	106.3	303,576
KL1234	30	18,650	18.2	159,217	56.6	161,517
KL5678	30	19,591	18.3	160,413	53.4	152,552
LS123	30	19,144	14.8	129,692	82.5	235,485
LS456	30	15,580	15.8	137,970	56.9	162,387
LW123	30	18,877	16.0	140,361	64.9	185,384
LW456	30	23,266	9.9	86,553	126.6	361,413
MC012	30	8,198	14.2	124,633	14.6	41,646
MC123	30	15,980	13.0	113,779	34.9	99,633
MC456	30	17,664	30.2	264,443	75.9	216,596

EXHIBIT D: SUBSTATION TRANSFORMER LOSSES (PAGE 3)

AUSTIN ENERGY
Evaluation of T&D System Losses

Estimated Distribution Substation Transformer Losses

SUBSTATION NAME	TRANSFORMER BASE RATING (MVA)	2018 COINCIDENT PEAK LOAD (kW)	TRANSFORMER NO-LOAD LOSSES (kW) (1)(7)	ANNUAL (2) NO-LOAD ENERGY LOSSES (kWh)	TRANSFORMER LOAD LOSSES (kW) (3)	ANNUAL (4) LOAD ENERGY LOSSES (kWh)
MC789	30	15,166	16.4	143,765	49.8	142,238
MP123	30	18,724	15.8	137,970	80.0	228,319
MP456	30	20,944	13.7	119,574	93.7	267,626
MP789	30	17,533	12.0	105,409	55.0	157,170
MT123	30	7,625	16.8	147,076	11.8	33,641
MT012	30	10,648	11.5	100,350	24.1	68,930
MU123	30	7,980	15.1	132,359	8.0	22,877
MU456	30	8,494	13.0	113,503	9.6	27,344
NL012	30	19,464	11.9	103,937	70.1	200,255
NL123	20	9,673	16.7	145,880	28.6	81,553
NL345	30	24,123	10.4	90,784	125.6	358,714
NL789	20	6,024	17.1	149,559	25.5	72,918
NW123	30	22,569	14.9	130,152	114.4	326,692
NW456	30	4,223	17.6	153,975	3.4	9,744
OC123	30	4,396	13.7	119,666	4.3	12,263
OC456	30	0	12.1	106,329	0.0	0
OH123	30	15,116	12.7	111,296	54.6	155,821
OH456	30	19,059	12.4	108,536	83.2	237,614
OH789	30	21,594	14.1	123,621	101.0	288,344
PE1234	30	23,433	14.7	129,048	124.8	356,345
PE5678	30	25,747	14.7	129,048	152.7	436,130
PL123	30	26,716	14.8	129,416	135.0	385,519
PL789	50	20,161	21.9	192,238	59.5	169,763
PL101112	30	21,491	17.0	149,008	83.2	237,584
PL131415	30	4,250	14.8	129,600	2.3	6,446
RP123	20	396	15.6	136,498	0.1	240
RP789	30	17,417	15.5	136,038	38.2	108,957
SK123	30	9,236	30.0	262,971	20.9	59,576
SK456	30	23,276	13.3	116,079	122.1	348,610
SL123	30	25,975	15.1	131,991	132.8	379,192
SL456	30	24,754	29.9	261,683	153.6	438,498
SL789	30	23,484	15.5	136,038	115.6	330,200
SP123	30	18,073	13.8	121,138	46.2	131,984
SP789	30	21,930	14.1	123,529	113.3	323,424
SP012	30	22,445	14.6	127,760	113.6	324,264
SP345	70	28,121	21.1	184,512	77.8	222,292
SP678	70	28,004	21.0	183,960	65.8	187,932
SN-NT1	50	0	15.8	137,970	0.0	0
SN-NT2	50	23,056	15.8	137,970	50.2	143,288
SR123	30	17,538	13.1	114,791	44.0	125,658
ST123	30	16,411	15.0	130,980	50.8	145,147
ST456	30	12,624	11.0	96,211	29.0	82,842
ST789	30	18,677	15.5	135,487	78.7	224,841
SU123	30	20,083	12.2	106,881	84.7	241,751
SU456	30	19,448	12.7	110,836	77.1	220,044
SU789	30	9,652	14.7	128,956	12.7	36,279
SU012	30	7,853	15.4	135,119	7.7	22,127
SU345	30	23,868	13.8	120,770	126.8	362,042

EXHIBIT D: SUBSTATION TRANSFORMER LOSSES (PAGE 4)

AUSTIN ENERGY
Evaluation of T&D System Losses

Estimated Distribution Substation Transformer Losses

SUBSTATION NAME	TRANSFORMER BASE RATING (MVA)	2018 COINCIDENT PEAK LOAD (kW)	TRANSFORMER NO-LOAD LOSSES (kW) (1)(7)	ANNUAL (2) NO-LOAD ENERGY LOSSES (kWh)	TRANSFORMER LOAD LOSSES (kW) (3)	ANNUAL (4) LOAD ENERGY LOSSES (kWh)
SW123	30	24,113	16.8	147,168	115.4	329,571
SW456	30	23,448	18.2	159,125	105.1	299,978
SW789	30	21,416	13.2	115,895	95.1	271,464
TP123	30	20,630	10.4	91,060	86.7	247,628
TP456	30	17,075	11.3	98,879	61.5	175,489
TP789	30	20,066	16.6	145,604	78.4	224,001
TR123	30	25,964	13.7	120,310	185.1	528,477
TR456	30	11,468	14.1	123,621	32.3	92,197
TR789	30	19,891	13.5	118,654	90.7	258,991
VE123	50	0	16.2	142,201	0.0	0
WA123	30	16,702	26.9	235,653	88.5	252,845
WA456	30	7,675	26.8	234,457	17.9	50,971
WA789	30	6,974	16.9	147,812	9.7	27,704
WB123	50	3,233	15.7	137,878	0.8	2,369
WB456	50	3,221	22.0	192,698	0.9	2,429
WC012	30	15,324	12.2	107,065	46.5	132,734
WC789	30	14,429	10.3	90,600	58.5	166,944
WI012	30	14,869	12.1	105,593	41.1	117,233
WI123	40	22,578	14.3	125,093	106.0	302,586
WI456	40	28,787	16.2	141,833	164.3	469,051
WI789	30	17,333	16.2	141,833	57.5	164,186
WL123	30	13,387	22.7	198,677	39.9	113,935
WL456	30	23,343	13.4	117,366	73.2	208,890
WL789	30	18,502	13.8	120,494	78.9	225,381
TOTALS	5,613	2,792,030	2,862.5	25,075,680	11,055.8	31,570,019

Notes:
(1) From Austin Energy test reports
(2) Annual No-Load Energy Losses is based on calculated demand losses times 8760 hours.
(3) Calculated in Feederall model with 2018 peak load flows
(4) Annual Load Energy Losses is based on transformer load losses, 8760 hours, and a loss factor calculated from the annual load factor
(5) No-Load Loss values were estimated based on the average No-Load Loss of th 30 MVA Transformers
(6) Load Loss values were estimated based on 30 MVA Transformers of simlar loading
(7) Units with no No-Load Losses are de-energized or out of service

EXHIBIT E: DISTRIBUTION LINE LOSSES

AUSTIN ENERGY

Evaluation of T&D System Losses

Estimated Primary Distribution Line Losses

DISTRIBUTION VOLTAGE (kV)	LENGTH OF LINE (Miles)	DEMAND LOSSES (1) AT 2018 PEAK (kW)	ANNUAL ENERGY LOSSES (kWh)
12.5	5,803.0	37,612.1	107,401,352
TOTALS	5,803.0	37,612.1	107,401,352

Notes:
(1) Peak losses extracted from Feederall model

EXHIBIT F: DISTRIBUTION TRANSFORMER LOSSES

AUSTIN ENERGY

Evaluation of T&D System Losses

Estimated Distribution Transformer Losses

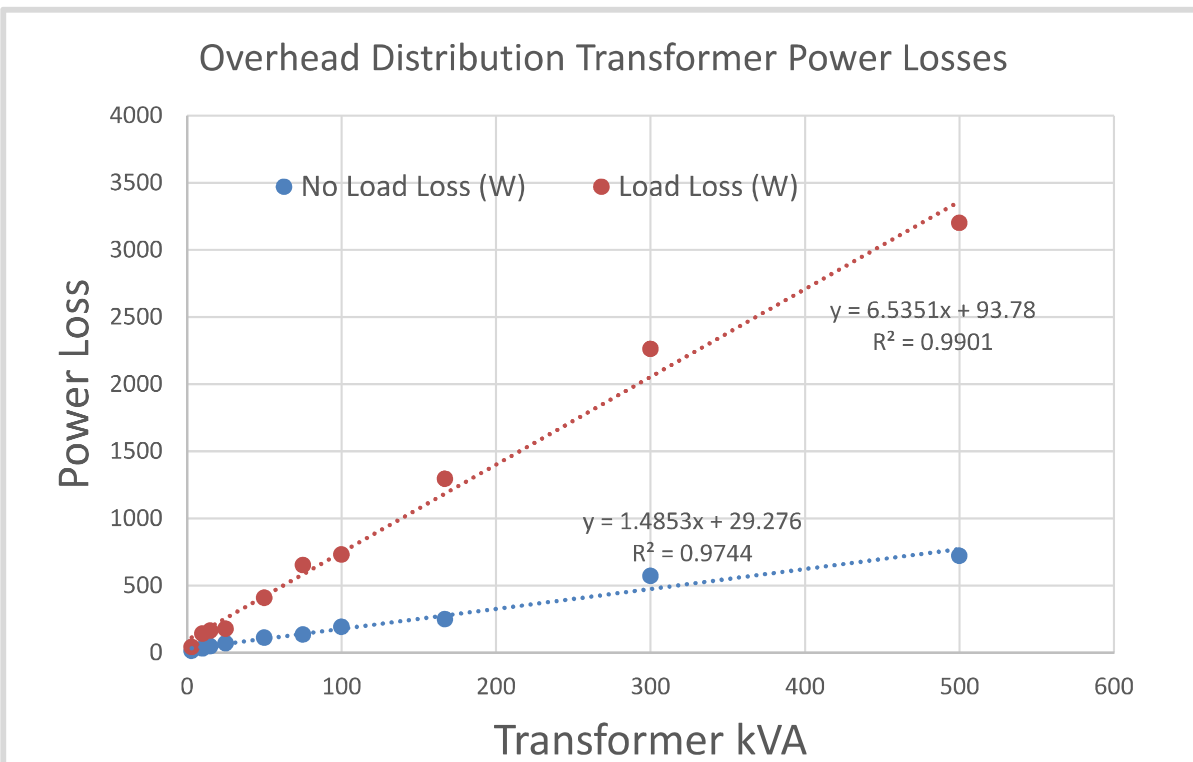
LOCATION	TOTAL NO-LOAD LOSSES (kW)	TOTAL LOAD LOSSES (kW)	NUMBER OF XFMRS	TOTAL XFMR kVA	TOTAL ANNUAL ENERGY NO-LOAD LOSS (kWh)	TOTAL ANNUAL ENERGY LOAD LOSS (kWh)
Distribution Transformers	20,415	9,197	84,377	7,485,681	178,834,475	26,260,895
TOTALS	20,415	9,197	84,377	7,485,681	178,834,475	26,260,895

Notes:
(1) Losses were estimated for each distribution transformer size based on the manufacturer test reports for similar sized transformers
(2) Transformer loading based on customer sales and total transformer capacity
(3) Results excludes primary metered transformers
(4) Calculated Transformer Loading Percentage 36.62%

EXHIBIT G: TEST REPORT OF DISTRIBUTION TRANSFORMER LOSSES

A: OVERHEAD DISTRIBUTION TRANSFORMERS

kVA	No Load Loss (W)	Load Loss (W)
3	14	43
10	31	141
15	47	164
25	70	178
50	111	409
75	135	652
100	192	730
167	250	1295
300	571	2262
500	721	3200



B: UNDERGROUND DISTRIBUTION TRANSFORMERS

KVA	Transformer	No-Load Loss (W)	Load Loss (W)
75	75KVA, 120/208V	221	923
75	75KVA, 120/208V	207	910.9
75	75KVA, 277/480V	224	565
75	75KVA, 277/480V	196	861
150	150KVA, 120/208V	367	1249
150	150KVA, 120/208V	291	1445
150	150KVA, 277/480V	374.2	1263.9
225	225KVA, 120/208V	455	1634
225	225KVA, 120/208V	393	2319
300	300KVA, 120/208V	634	2280
300	300KVA, 277/480V	571	2262
300	300KVA, 277/480V	500	2904
500	500KVA, 120/208V	882	3417
500	500KVA, 120/208V	968	3841
500	500KVA, 120/208V	845	3582
500	500KVA, 277/480V	721	3200
500	500KVA, 277/480V	816	3888
500	500KVA, 277/480V	862	2841
750	750KVA, 120/208V	1225	5744
750	750KVA, 120/208V	1363	5118
750	750KVA, 120/208V	1037	5884
750	750KVA, 277/480V	1261	4718
1000	1000KVA, 277/480V	1251	6236
1000	1000KVA, 277/480V	1389	5855
1500	1500KVA, 277/480V	1789	8939
1500	1500KVA, 277/480V	2329	9345
2000	2000KVA, 277/480V	2561.9	14964.2
2500	2500KVA, 277/480V	2493	15200

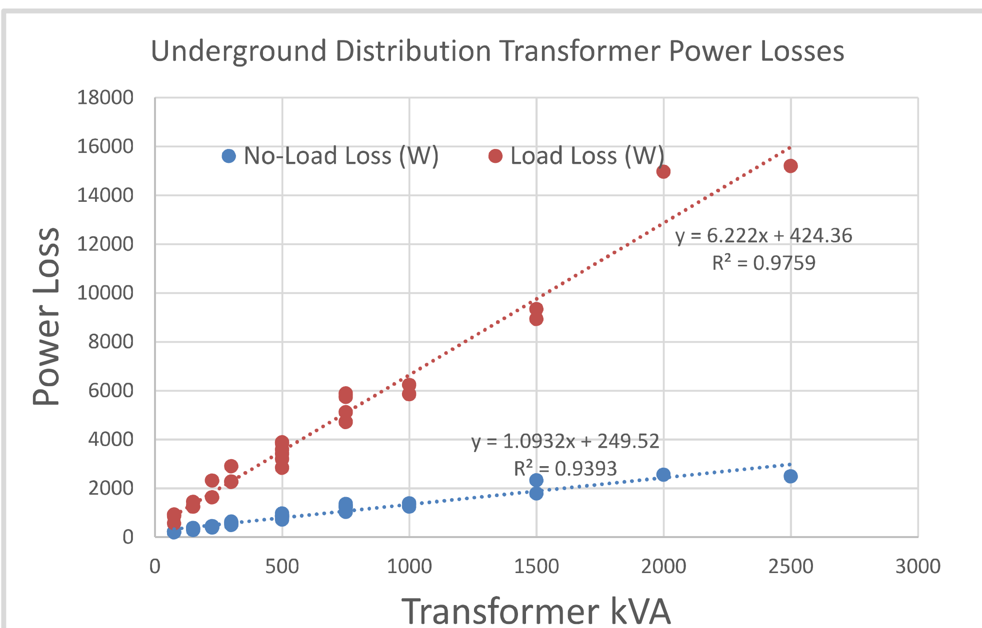


EXHIBIT H: SECONDARY LINE LOSSES

AUSTIN ENERGY
Evaluation of System Losses

Estimated Service Line Losses

Type	MILES OF CONDUCTOR	PERCENT CONDUCTOR PEAK LOADING/CAPACITY (1)	PEAK DEMAND LOSS (kW)	ANNUAL ENERGY LOSSES (kWh)
Service and Secondary Conductor	5,896	31.7%	16,751	47,832,685
Streetlight Conductor	1,626	1.5%	6.8	9,767
TOTAL	7,522		16,758	47,842,452

Notes
(1) Conductor loading percentage is as follows:
Secondary Conductor = (Annual Energy Sales (kWh)-Streetlight Annual Energy Sales (kWh)) / (Time * Load Factor) / Conductor Capacity (kVA)
Streetlight Conductor = (Streetlight Annual Energy Sales (kWh) / (Time * Load Factor)) / Conductor Capacity (kVA)

EXHIBIT I: SECURITY AND STREETLIGHT LOSSES

AUSTIN ENERGY

Evaluation of T&D System Losses

Estimated Street & Security Light Losses

SECURITY & STREET LIGHT SIZES	ASSUMED USAGE (WATTS)	NUMBER OF LIGHTS FROM GIS	ASSUMED DEMAND (kW)	ANNUAL ENERGY CONSUMPTION (kWh)
30 Watt	33	1	0.0	120
51 Watt	56	17	1.0	3,481
70 Watt	77	64	4.9	17,987
75 Watt	83	8,829	728.4	2,658,633
80 Watt	88	26	2.3	8,351
100 Watt	110	30,194	3,321.3	12,122,891
150 Watt	165	521	86.0	313,772
175 Watt	193	2,197	422.9	1,543,667
250 Watt	275	18,157	4,993.2	18,225,089
400 Watt	440	4,937	2,172.3	7,928,822
1000 Watt	1,100	87	95.7	349,305
1500 Watt	1,650	12	19.8	72,270
TOTALS		65,042	11,847.8	43,244,389
TOTAL BILLED kWh				49,962,729
UNACCOUNTED FOR LIGHT CONSUMPTION				6,718,340

Notes:
(1) Estimated 10 hours of operation per day

EXHIBIT J: SYSTEM LOSSES PIE CHARTS

AUSTIN ENERGY
Evaluation of T&D System
Losses

T&D Energy Losses by Voltage

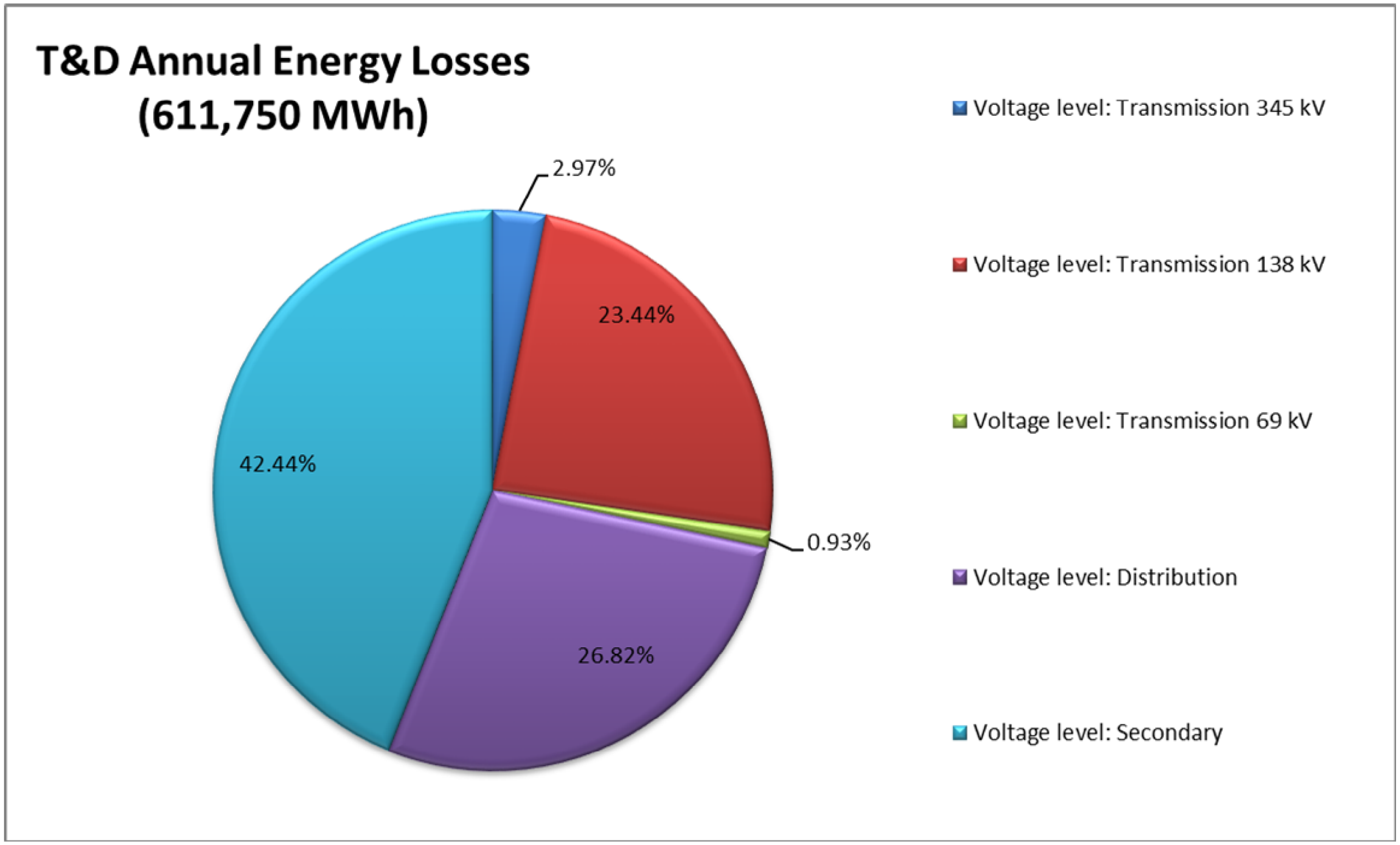


EXHIBIT J: SYSTEM LOSSES PIE CHARTS (page 2)

AUSTIN ENERGY

Evaluation of T&D System Losses

T&D Energy Losses by Equipment Type

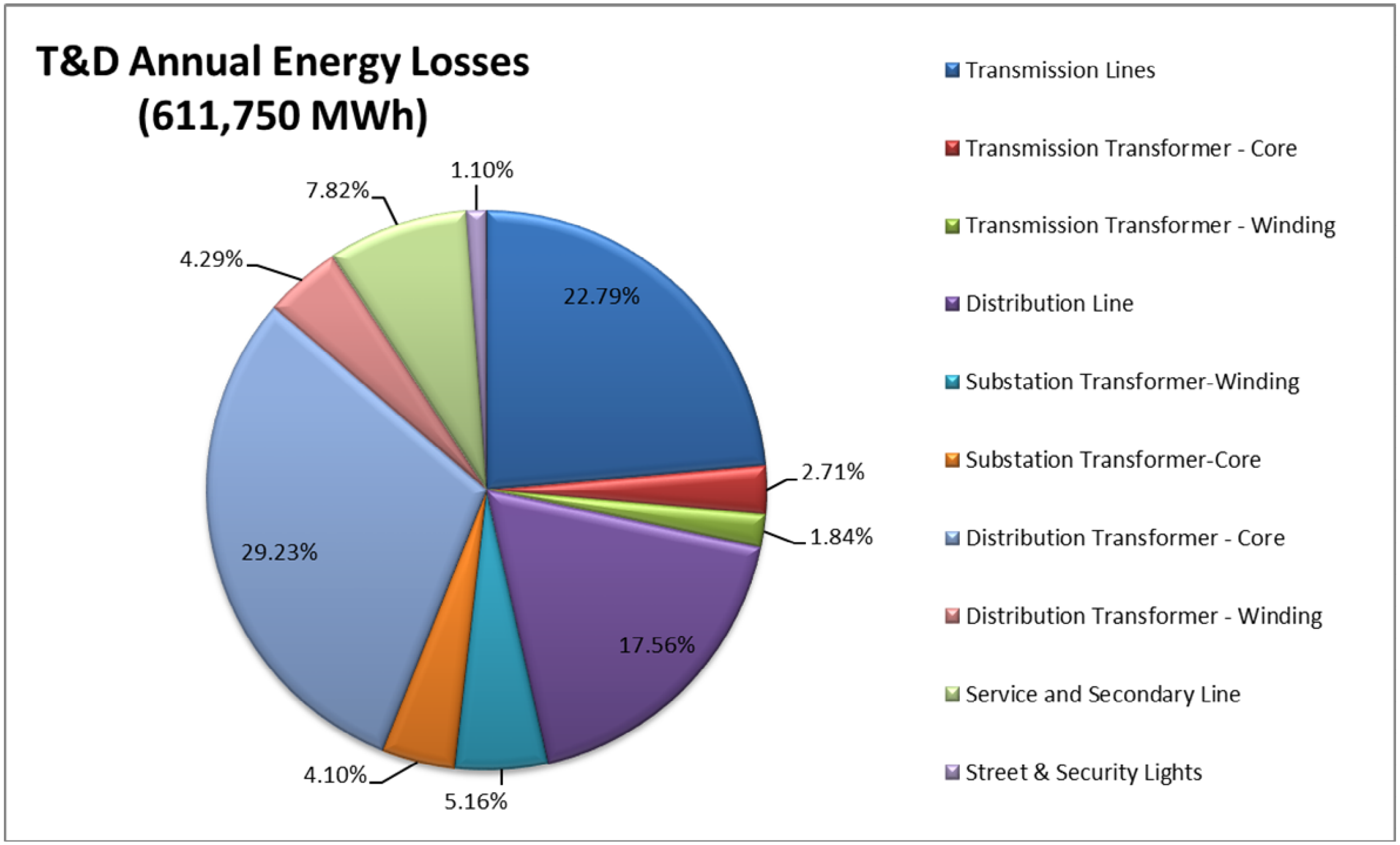


EXHIBIT J: SYSTEM LOSSES PIE CHARTS (PAGE 3)

AUSTIN ENERGY
Evaluation of T&D System Losses

T&D Energy Losses by Equipment Type

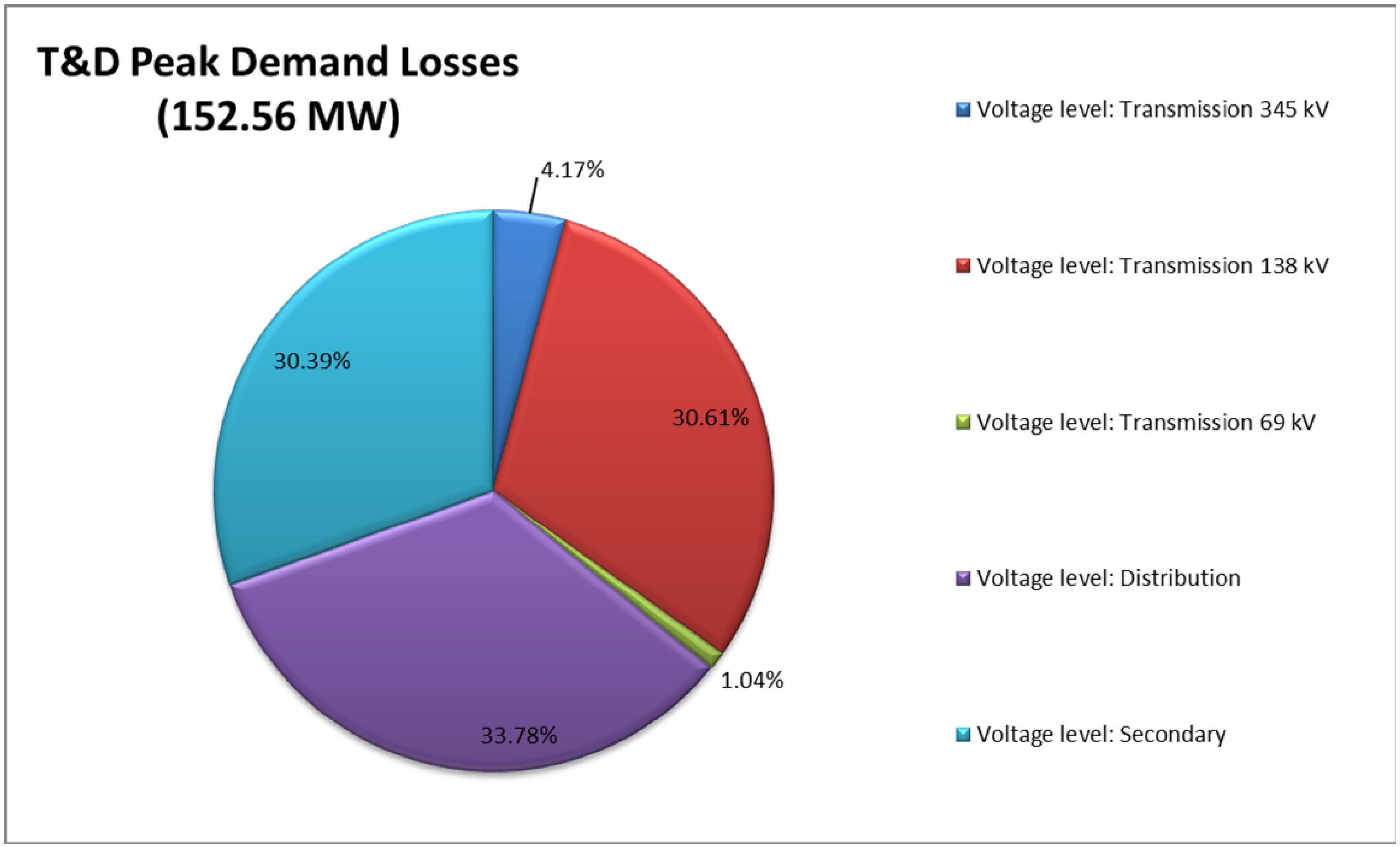
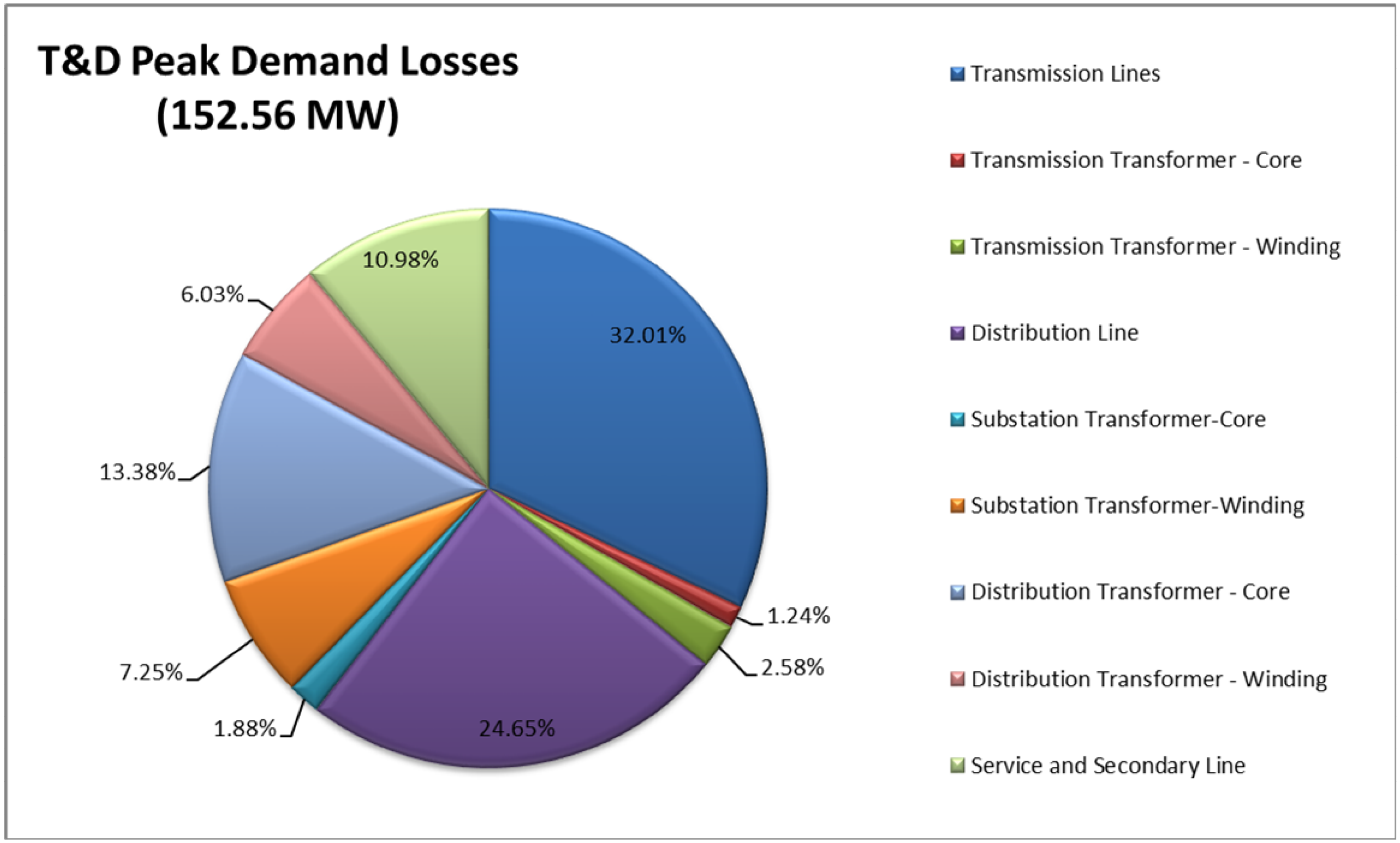


EXHIBIT J: SYSTEM LOSSES PIE CHARTS (PAGE 4)

AUSTIN ENERGY
Evaluation of T&D System Losses

T&D Energy Losses by Equipment Type



DOCUMENT CHANGE AND REVIEW HISTORY

The change history below reflects changes to the contents or format of this document.

Change History:

Date	Author(s)	Description	Version	Company
5/2/2019	Reza Ebrahimian	Final Report Version 1.0	1.0	Austin Energy
11/6/2019	Jianhui Zhang	Final Report Version 2.0	2.0	Austin Energy

Review Log:

Date	Reviewed by	Version	Company

from Bus #	from Bus N	to Bus #	to Bus Nar	ID	P (MW)	Q (MVar)	P Loss (MV	Q Loss (MVar)
7040	L_AUSTRC	9041	LOSTPINE	2	-442.9377	27.75191	0.948425	15.49727
7040	L_AUSTRC	9044	DUNLAP5	1	13.02415	68.74413	0.008837	0.086888
7042	L_ZORN__	9074	LYTTON5	1	28.56307	13.95322	0.018421	0.151516
7048	L_GARFIE!	9048	GARFIELD	1	236.4872	16.57761	0.005402	0.054015
7048	L_GARFIE!	9048	GARFIELD	2	236.4872	16.57761	0.005402	0.054015
7048	L_GARFIE!	9074	LYTTON5	1	214.9816	32.45453	0.331932	2.530752
7055	L_FPPYD2	9073	HOLMAN	1	368.9364	-101.2728	0.838039	7.598222
7055	L_FPPYD2	9074	LYTTON5	1	267.8951	-39.19563	2.731376	20.80059
7056	L_FPPYD1	9041	LOSTPINE	1	143.9958	-32.49147	0.426461	3.769756
7056	L_FPPYD1	9041	LOSTPINE	2	143.9208	-32.47117	0.426012	3.767796
7202	L_HICROS	9147	HICROS_D	1	-44.72426	-28.37102	0	0
7209	L_ELROY_	9198	ELROY_LD	1	1.959782	0.663468	0	0
7288	L_WELLBF	9288	WELLSB_L	1	3.296924	1.60253	0	0
7288	L_WELLBF	9289	WELLSB_L	1	3.286717	1.551494	0	0
7310	L_SIMGID8	9328	AUSTROP8	1	73.13757	1.357771	0.580464	3.112223
7325	L_MENDO	9075	LYTTON8	1	-52.14964	-23.21022	0.006845	0.052042
7329	L_WEBBEI	9328	AUSTROP8	1	43.3227	-4.398865	0.002751	0.014431
7335	L_HOWAL	9217	HOWARDL	1	44.80471	5.316686	0.000204	0.002039
7336	L_GILLCR8	9054	GILLE138	1	0	0	0	0
7349	L_LAKEAE	9235	LAKEWY_L	1	19.27119	3.327546	0	0
7349	L_LAKEAE	9236	LAKEWY_L	1	23.75215	4.093086	0	0
7500	L_TURNEF	9075	LYTTON8	1	-260.1785	-0.469628	2.350211	22.65102
7505	L_TRADPC	9278	TPOST_LD	1	0	0	0	0
7505	L_TRADPC	9281	TPOST_LD	1	17.42369	1.786259	0	0
7505	L_TRADPC	9282	TPOST_LD	2	21.05745	6.308049	0	0
7534	L_AVERRA	9223	JOLLYVIL	1	-222.3859	-2.048083	0.170599	1.610432
7535	L_BULLHC	9161	BULICK_LI	1	2.33	0.62	0	0
7535	L_BULLHC	9162	BULICK_LI	1	1.17	0.26	0	0
9001	BA138_CA	9158	BARTON	1	0	31.33256	0	0
9002	BC138_CA	9160	BEECREEI	1	0	31.39877	0	0
9003	CL138_CA	9179	CARDINAL	1	0	31.45462	0	0
9004	CA69_CAF	9269	CENTAUS	1	0	31.34651	0	0
9005	CF138_CA	9183	COMMONF	1	0	31.27558	0	0
9006	FV138_CA	9199	FISKVIL	1	0	31.39017	0	0
9007	HA69_CAF	9204	HARRIS	1	0	31.87375	0	0
9008	HV138_CA	9207	HIDDENVL	1	0	31.06669	0	0
9009	JV138_CAI	9223	JOLLYVIL	1	0	30.89766	0	0
9010	MP138_CA	9238	MAGPLAN	1	0	31.24608	0	0
9011	MC138_CA	9076	MCNEIL_D	1	0	31.26971	0	0
9012	OH138_CA	9247	OAKHILL	1	0	31.09365	0	0
9013	PE138MB3	9117	PE_MB3	1	-0.000001	63.39703	0	0
9014	PE138MB4	9116	PE_MB4	1	0	31.69851	0	0
9015	PK138_CA	9259	PILOTKNO	1	0	31.71562	0	0
9016	SW138_CA	9263	SALEMWL	1	0	31.34278	0	0
9017	BAL138_CA	9283	UTBALC	1	0	31.19031	0	0
9018	WI138_CA	9295	WILIAMSN	1	0	31.09905	0	0
9025	HPSTATC	9116	PE_MB4	1	0	0	0	0
9041	LOSTPINE	9044	DUNLAP5	1	370.0326	-17.0477	0.86442	12.93735
9041	LOSTPINE	170174	LOSTPINE	1	-263.4273	23.0919	0.006717	0.067173
9041	LOSTPINE	170174	LOSTPINE	2	-263.4273	23.0919	0.006717	0.067173
9044	DUNLAP5	9045	DUNLAP8	1	382.1835	63.33152	0.390109	28.50683
9045	DUNLAP8	9188	DECKER_I	1	280.7292	12.5822	1.216839	11.86552
9045	DUNLAP8	9190	TRIDGE_M	1	281.1116	18.40765	3.850067	33.15391
9045	DUNLAP8	9328	AUSTROP8	1	-191.1732	3.232813	0.399664	3.675423
9048	GARFIELD	9071	GARFIELD	1	235.0858	16.63385	0.160158	16.51758

9048	GARFIELD	9071	GARFIELD	2	237.878	16.41334	0.191269	16.71142
9071	GARFIELD	9147	HICROS_D	1	307.6768	16.98412	4.355527	33.19941
9071	GARFIELD	9237	STONEY	1	164.9355	-17.16593	0.50536	3.764811
9073	HOLMAN	9074	LYTTON5	1	242.2035	-12.95313	1.519903	14.15585
9073	HOLMAN	44200	HILLJE__B	1	125.8949	-86.2325	0.725565	6.160257
9074	LYTTON5	10000069	AT3	3	242.3689	29.49361	0.10385	19.16038
9074	LYTTON5	10000271	UPDATE	2	240.4692	29.44053	0.062484	19.1145
9074	LYTTON5	10000272	UPDATE	1	266.2035	30.66349	0.138989	21.19577
9075	LYTTON8	9259	PILOTKNO	1	214.7948	-16.91761	1.739252	13.79564
9075	LYTTON8	9267	SLAUGHTI	1	218.8614	6.439845	2.438233	21.52047
9075	LYTTON8	10000069	AT3	3	-242.1785	-11.78137	0.086542	-1.448137
9075	LYTTON8	10000271	UPDATE	2	-240.2932	-11.86541	0.113608	-1.539385
9075	LYTTON8	10000272	UPDATE	1	-265.8699	-11.22593	0.194584	-1.758207
9076	MCNEIL_D	9079	MCNEIL_M	1	156.7039	8.637399	0	0
9076	MCNEIL_D	9193	DESSAU	2	-180.5479	20.69294	0.415351	3.38874
9077	MCNEIL_M	9080	MCNEIL	1	56.61603	-3.042241	0.041376	1.321154
9077	MCNEIL_M	9082	MC1013BT	1	-237.3224	42.95841	0	0
9077	MCNEIL_M	9199	FISKVIL	1	-18.6152	-20.19013	0.011131	0.061482
9077	MCNEIL_M	9238	MAGPLANT	1	199.3215	-19.72604	0.444207	3.457614
9078	LYTTON_T	10000272	UPDATE	1	0	0	0	0
9079	MCNEIL_M	9082	MC1013BT	1	-74.73348	-24.55758	0	0
9079	MCNEIL_M	9193	DESSAU	1	-181.1438	20.47667	0.411312	3.399957
9079	MCNEIL_M	9217	HOWARDL	1	27.23964	21.75569	0.012099	0.093984
9079	MCNEIL_M	9279	SUMMIT_M	1	369.0304	-10.36432	0.913811	7.604215
9080	MCNEIL	9225	JUSTINLN	1	56.57465	-4.363396	0.346992	1.805191
9081	LYTTON_T	10000271	UPDATE	2	0	0	0	0
9082	MC1013BT	9188	DECKER_I	1	-312.0558	18.40084	3.120906	25.4939
9116	PE_MB4	9117	PE_MB3	1	-0.000189	31.69851	0	0
9117	PE_MB3	9118	PE_MB1	1	250.771	51.06619	0	0
9117	PE_MB3	9151	AMD	1	-250.7712	44.02936	0.951813	7.22063
9118	PE_MB1	9119	PE_MB2	1	66.09092	2.621905	0.033587	2.214618
9118	PE_MB1	9132	SEAHOLM	1	184.6801	48.44428	0.312426	1.612405
9119	PE_MB2	9166	BRACK	1	40.65677	1.626548	0.112901	0.568997
9119	PE_MB2	9257	PE_DB1	1	25.40056	-1.219261	0	0
9120	BURLSN_I	9121	BURLSN_I	1	188.2874	-14.11278	0	0
9120	BURLSN_I	9175	CARSON	1	-214.5403	7.03919	0.554281	4.031132
9121	BURLSN_I	9148	HICROS_M	1	-58.87551	18.71383	0.073759	0.460421
9121	BURLSN_I	9179	CARDINAL	1	208.9064	-38.16497	0.430206	3.50439
9122	KINGSB_M	9123	KINGSB_D	1	150.7299	4.686794	0	0
9122	KINGSB_M	9125	KINGSBEF	1	101.1023	8.454021	0.080947	5.495427
9122	KINGSB_M	9196	EDBLUEST	1	-170.4575	1.566948	0.231408	1.816983
9122	KINGSB_M	9200	GROVE	1	111.7445	-6.225463	0.198188	1.49195
9122	KINGSB_M	9284	WALNUTC	1	-193.1192	-8.482299	0.308564	2.497902
9123	KINGSB_D	9163	BRSTRM_I	1	-72.12028	-6.741267	0.09278	0.56029
9123	KINGSB_D	9342	MUELLER	1	183.4606	5.487473	0.317965	2.086647
9125	KINGSBEF	9214	HOLLY_ME	1	101.0213	2.958603	0.351782	2.746298
9127	NORTHL_I	9128	NORTHL_I	1	9.324631	5.499377	0	0
9127	NORTHL_I	9286	WARREN	1	-43.82496	-11.26644	0.012668	0.105635
9128	NORTHL_I	9228	LAKESHOI	1	8.564745	-11.25983	0.005667	0.03045
9128	NORTHL_I	9238	MAGPLANT	1	-81.92111	12.27418	0.184625	1.020584
9128	NORTHL_I	9275	STECK	1	22.76992	4.602526	0.004329	0.031983
9128	NORTHL_I	10000270	UPDATE	1	59.91108	-0.117498	0.016859	1.626379
9129	NORTHLAI	9227	KOENIG	1	33.85922	-2.492043	0.048629	0.301339
9129	NORTHLAI	10000270	UPDATE	1	-59.87736	1.512152	0.016859	-0.231725
9130	NORTHL_T	10000270	UPDATE	1	0	0	0	0
9132	SEAHOLM	9139	AUSTNDAI	1	89.19589	-4.856787	0.135275	0.829842

9132	SEAHOLM	9179	CARDINAL	1	-125.3099	19.07614	0.130705	0.999417
9132	SEAHOLM	9286	WARREN	1	75.91718	19.5746	0.079989	0.646631
9139	AUSTNDAI	9160	BEECREEI	1	63.69574	-6.14166	0.008137	0.048413
9139	AUSTNDAI	170022	AUSTDAM	1	-0.000001	0.000003	0	0
9147	HICROS_D	9148	HICROS_M	1	106.93	-75.56557	0	0
9147	HICROS_D	9267	SLAUGHTI	1	46.55323	20.91363	0.030762	0.222871
9148	HICROS_M	9259	PILOTKNO	1	-187.6154	-14.1811	0.680483	5.859908
9148	HICROS_M	9263	SALEMWL	1	117.7132	-21.32317	0.122547	0.95045
9148	HICROS_M	9263	SALEMWL	2	117.883	-21.37682	0.122909	0.95183
9151	AMD	9200	GROVE	1	-281.4464	19.83216	0.25117	1.852378
9155	ANGUSVA	9203	HAMLTN_I	1	-55.47045	-7.397564	0.041533	0.241015
9155	ANGUSVA	9220	JETT	1	18.33667	6.632024	0.007261	0.0423
9158	BARTON	9183	COMMONI	1	85.10761	-2.251446	0.099587	0.802466
9158	BARTON	9263	SALEMWL	1	-164.5661	20.50034	0.375363	2.967285
9158	BARTON	9285	VEGA	1	13.0913	5.438478	0.002479	0.139958
9160	BEECREEI	9228	LAKESHOI	1	26.89065	18.31223	0.010345	0.064712
9163	BRSTRM_I	9165	BRSTRM_I	1	235.4083	9.762236	0	0
9163	BRSTRM_I	9251	ONIONCK	1	-320.656	-19.86555	1.313769	10.35856
9164	MTCNTR_I	9165	BRSTRM_I	1	-224.5765	-5.154495	0.277532	2.126095
9164	MTCNTR_I	9167	MTCNTR_I	1	213.7059	1.143067	0	0
9166	BRACK	9204	HARRIS	1	-17.9944	-21.04289	0.043853	0.228463
9167	MTCNTR_I	9200	GROVE	1	205.928	-1.74557	0.337381	2.378326
9169	BRODIE	9247	OAKHILL	1	118.2305	-17.89183	0.25671	1.881586
9169	BRODIE	9267	SLAUGHTI	1	-186.8331	6.786404	0.365008	2.64982
9171	CAMERON	9199	FISKVIL	1	58.65765	-8.979387	0.039521	0.215443
9171	CAMERON	9291	WHELESS	1	-109.4283	4.243248	0.146475	0.796021
9175	CARSON	9259	PILOTKNO	1	-252.2284	-6.495235	0.61754	4.88991
9183	COMMONI	9207	HIDDENVL	1	25.70422	17.78433	0.019215	0.155504
9184	DAFFIN	9271	SPRNKL_M	1	266.406	-9.023258	0.9415	8.30206
9184	DAFFIN	9328	AUSTROP	1	-320.7899	6.818503	3.176912	25.68513
9187	DECKER_I	9196	EDBLUEST	1	206.404	21.85776	0.602364	4.731068
9187	DECKER_I	9216	SANDHSYI	1	-40.62505	-8.560425	0.040269	0.317823
9187	DECKER_I	9251	ONIONCK	1	-34.32249	-7.664156	0.028619	0.227878
9187	DECKER_I	9272	SPRNKL_M	1	316.0983	65.66568	1.345179	12.49427
9187	DECKER_I	9284	WALNUTC	1	224.3655	19.78984	0.571342	4.624914
9187	DECKER_I	170151	DECKER_I	1	-287.0048	-52.20703	0.545165	22.02137
9187	DECKER_I	170152	DECKER_I	1	-384.9155	-38.88166	0.784516	35.34678
9188	DECKER_I	170153	DECKE_DI	1	-35.6649	-0.955595	0.065085	2.261851
9188	DECKER_I	170155	DECKE_DI	1	0.000507	-3.105153	0.000493	0.017133
9190	TRIDGE_M	9191	TRIDGE_M	1	230.4615	-23.54753	0	0
9191	TRIDGE_M	9217	HOWARDL	1	218.7539	-26.53824	0.286657	1.535313
9193	DESSAU	9271	SPRNKL_M	2	-268.4848	-12.55994	0.380346	3.6068
9193	DESSAU	9272	SPRNKL_M	1	-277.7529	-11.28908	0.41609	3.727859
9202	HAMLTN_I	9203	HAMLTN_I	1	134.0798	-12.75672	0	0
9202	HAMLTN_I	9260	RIVERPLA	1	10.23591	4.067027	0.003585	0.023795
9202	HAMLTN_I	9280	SUMMIT_M	1	-231.5172	8.215439	0.220609	1.770255
9202	HAMLTN_I	9295	WILIAMSN	1	54.89568	-7.824197	0.087749	0.48308
9203	HAMLTN_I	9283	UTBALC	1	35.78951	-32.18977	0.012502	0.095152
9204	HARRIS	9214	HOLLY_ME	1	-18.03825	10.66933	0.045408	0.230058
9207	HIDDENVL	9260	RIVERPLA	1	29.04383	-1.050524	0.010766	0.087742
9207	HIDDENVL	78207	L_HIDDVA	1	-53.74154	37.45794	0	0
9213	HOLLY_ME	9214	HOLLY_ME	1	-82.58588	-10.87858	0	0
9213	HOLLY_ME	9244	FIESTA_MI	1	57.78409	4.642957	0.172372	1.072352
9213	HOLLY_ME	9257	PE_DB1	1	24.80179	6.235621	0.003354	0.021929
9216	SANDHSYI	9251	ONIONCK	1	234.0426	52.49385	0.016671	0.283415
9216	SANDHSYI	9251	ONIONCK	2	209.7713	44.56179	0.017769	0.253212

9216	SANDHSYI	170211	SANDHSYI	1	-90.49944	-25.28951	0.280591	12.56347
9216	SANDHSYI	170213	SANDHSYI	1	-89.36144	-25.48878	0.278578	12.3642
9216	SANDHSYI	170215	SANDHS_S	1	-213.6524	-26.92839	0.14781	10.92454
9216	SANDHSYI	170217	SANDHSYI	1	-90.96601	-27.09013	0.093976	10.76286
9217	HOWARDL	9224	ASHTON V	1	243.587	-9.693466	0.252392	1.851273
9220	JETT	9260	RIVERPLA	1	-21.07037	-2.718119	0.015999	0.092556
9223	JOLLYVIL	9224	ASHTON V	1	-232.0623	21.21607	1.44276	8.958275
9223	JOLLYVIL	9245	NORTHWE	1	-53.91148	-7.187377	0.028953	0.196103
9225	JUSTINLN	9227	KOENIG	1	31.70997	-8.91773	0.04056	0.213674
9227	KOENIG	9269	CENTAUS	1	26.44768	-21.3156	0.024583	0.193433
9237	STONEY	9251	ONIONCK	1	146.5267	-23.62511	0.411667	3.221315
9238	MAGPLANT	9280	SUMMIT_M	1	58.38641	14.87605	0.027589	0.211635
9243	FIESTA_MI	9244	FIESTA_MI	1	-34.71698	-1.083005	0	0
9243	FIESTA_MI	9269	CENTAUS	1	18.64064	-0.805326	0.009175	0.072012
9245	NORTHWE	9295	WILIAMSN	1	-81.28552	-10.58349	0.102196	0.635509
9247	OAKHILL	9254	PATTON_M	1	61.04823	2.968645	0.011997	0.087725
9251	ONIONCK	9259	PILOTKNO	1	229.0825	34.32397	0.996323	7.840851
9253	PATTON_M	9254	PATTON_M	1	-14.18521	2.456122	0	0
9253	PATTON_M	9285	VEGA	1	-13.08842	-5.650975	0.000407	0.003235
9271	SPRNKL_M	9272	SPRNKL_M	1	-36.58416	-39.11255	0	0
9275	STECK	9283	UTBALC	1	-25.93294	3.607053	0.004327	0.031458
9279	SUMMIT_M	9280	SUMMIT_M	1	225.6092	-12.88976	0	0
9279	SUMMIT_M	9295	WILIAMSN	1	112.1511	-8.520853	0.269826	1.840921
9287	WEBBERS	9328	AUSTROP8	1	15.30817	12.41081	0.002714	0.016736
9287	WEBBERS	170341	WEBBER_	1	-15.30817	-12.41082	0.011823	1.497242
9291	WHELESS	9342	MUELLER	1	-165.9491	1.425286	0.38234	2.135643
9328	AUSTROP8	10000283	UPDATE	2	-190.2372	-4.645904	0.066541	-3.232511
9328	AUSTROP8	10000284	UPDATE	1	-194.1201	-4.421251	0.076573	-1.560626
9329	AUSTROP_	10000284	UPDATE	1	0	0	0	0
9330	AUSTROP_	10000283	UPDATE	2	0	0	0	0

TIEC 1-3: Provide a schedule showing AE's monthly system peak demand for calendar years 2017 through 2021 and as projected for calendar years 2022 through 2026.

ANSWER: See attachment.

Attachment TIEC 1-3a: Austin Energy's monthly system hourly peak demand for calendar year 2017 through 2021

Austin Energy filed an objection on May 26, 2022 to the portion of TIEC 1-3 relating to Austin Energy's projected system hourly peak demand for calendar year 2022 through 2026.

Prepared by: ZD and JL

Sponsored by: Brian Murphy

Month	Demand
Jan-2017	2118
Feb-2017	1665
Mar-2017	1894
Apr-2017	2186
May-2017	2173
Jun-2017	2654
Jul-2017	2620
Aug-2017	2624
Sep-2017	2451
Oct-2017	2322
Nov-2017	1961
Dec-2017	2009
Jan-2018	2381
Feb-2018	2021
Mar-2018	1825
Apr-2018	1857
May-2018	2532
Jun-2018	2563
Jul-2018	2878
Aug-2018	2744
Sep-2018	2411
Oct-2018	2220
Nov-2018	2023
Dec-2018	1883
Jan-2019	1983
Feb-2019	1984
Mar-2019	2156
Apr-2019	1961
May-2019	2276
Jun-2019	2592
Jul-2019	2700
Aug-2019	2810
Sep-2019	2636
Oct-2019	2427
Nov-2019	2060
Dec-2019	1969
Jan-2020	1698
Feb-2020	2031
Mar-2020	1880
Apr-2020	2085
May-2020	2370
Jun-2020	2556
Jul-2020	2731
Aug-2020	2810
Sep-2020	2607
Oct-2020	2192

Nov-2020	1730
Dec-2020	1890
Jan-2021	2018
Feb-2021	2580
Mar-2021	1634
Apr-2021	2047
May-2021	2273
Jun-2021	2620
Jul-2021	2593
Aug-2021	2644
Sep-2021	2644
Oct-2021	2194
Nov-2021	1712
Dec-2021	1785