CHUGACH
POWERING ALASKA'S FUTURE

ELECTRONICALLY FILED WITH RCA

March 15, 2017

TARIFF ADVICE LETTER NO. 436-8

Regulatory Commission of Alaska
701 W. 8th Avenue, Suite 300
Anchorage, AK 99501

Commissioners:

The tariff filing described below is hereby transmitted to you for filing in compliance with the Alaska Public Utilities Commission Act and Sections 3 AAC 48.200 - 3 AAC 48.420 of the Alaska Administrative Code. The purpose of this filing is to revise Chugach Electric Association, Inc.'s (Chugach) Operating Tariff to update its generation and transmission (G&T) loss factor based on calendar-year 2016 operating results.

TARIFF SHEET NUMBER ORIGINAL REVISED	CANCELS SHEET NUMBER ORIGINAL REVISED	SCHEDULE OR RULE NUMBER
103.4 – 14th Revision	103.4 – 13th Revision	Calculation of G&T Losses
103.5 – 14th Revision	103.5 – 13th Revision	

This filing is not for a new service, will not result in the termination of an existing service, conflict with any other schedule or rate contained in Chugach's operating tariff, or in any other way adversely impact customers or the public. The loss factor is used for the allocation of system costs between G&T and Distribution functions in Chugach's cost of service studies, fuel and purchased power rate adjustment processes, and determination of losses applied to transmission wheeling transactions.

Approximately 68,200 Chugach retail members (81,000 retail metered locations) and Seward Electric System (Seward) are impacted by this filing. Homer Electric Association, Inc. (HEA), Matanuska Electric Association, Inc. (MEA), Anchorage Municipal Light & Power (ML&P) and Golden Valley Electric Association, Inc. (GVEA) are also impacted since the loss factor is used to determine losses on transmission wheeling transactions on the Chugach system.

Chugach's total revenues associated with electric service are projected to be $214 million in calendar year 2017. If approved, the updated loss factor will increase total G&T cost responsibility to Seward Electric System by approximately $17,000 and Chugach retail will decrease by approximately $17,000. In addition, the cost responsibility to all third part transmission customers (HEA, MEA, ML&P and GVEA) is estimated to total approximately $125,000, based on 2016 operating results. The update has no impact on Chugach's system revenue.

The updated G&T loss factor is 2.810 percent, based on 2016 operating results, as measured at generation. This compares with loss factors of 2.414 percent and 2.312 percent based on 2015 and 2014 operating results, respectively. Since 2011 (excluding 2016 results), Chugach's loss factor has averaged 2.613 percent, with a high of 2.985 percent in 2011 and a low of 2.312 percent in 2014. Previous G&T loss factors are summarized below:

Table 1: Summary of Previous G&T Loss Factors (measured at generation)

Test Year	Percent	Test Year	Percent
2016	2.810	2013	2.486
2015	2.414	2012	2.875
2014	2.312	2011	2.985

Tariff Sheet Nos. 103.4 and 103.5 summarize the calculations and resulting G&T and Distribution loss percentages based on calendar year 2016 operating results. Supporting data are included on Attachments I and II.

Compliance with U-99-106(12)

The G&T loss factor was calculated in accordance with the methodology contained in the stipulation between Chugach, HEA and MEA and accepted by the Commission in Docket U-99-106(12). Pursuant to this order, preliminary 2016 test year loss factor calculations and supporting work papers were provided to HEA, MEA and the Attorney General's office for review and comment. Preliminary calculations and work papers were also provided to GVEA, ML&P and Seward.

A meeting was held on February 22, 2017, to review the calculations and discuss preliminary results with the other Railbelt utilities. An updated version was sent to the other parties on March 10, 2017 for final review. Based on input from the other utilities and subsequent discussion, no significant changes to the calculation were required. However, a few changes were agreed upon by all parties which had minor impact on the results.

The parties agreed to remove "Eklutna Line Losses", the last line item associated with "Add Line and SVC Losses" which was found on the workpaper (Attachment I) and Tariff Sheet 103.4 between "Gross Energy Losses" and "Less Transformer Losses". Eklutna line losses are no longer relevant to Chugach's G&T Loss Factor calculation since the line segment between Briggs and the Eklutna Hydropower Plant was reconfigured to a radial line when MEA separated from Chugach's system. International Substation Transformers 1 and 2 were added to the Transformer Losses table, which is provided as Attachment II. These transformers serve both Chugach distribution load and G&T customers via the International Generation Station (IGT). Therefore the losses associated with Chugach distribution load were removed and the losses associated with IGT production remain within the total loss factor.

Other adjustments, which had no impact on results, include removing "MEA (Wholesale load less EGS Gen)" from the section, "Adjustment of G&T Losses for House Power" under, "G&T Deliveries" which was found toward the bottom of Attachment I and fed into the "G&T Deliveries"

line on Tariff Sheet No. 103.5. This line item is no longer relevant to the calculation since MEA is no longer a wholesale customer of Chugach. The additional descriptor, "(Net of 138kV breakers)" was added next to "Retherford" under the "Distribution Substation Deliveries" section on Attachment I. This was a clarification of the data source and resulted in no change to the formula or results. The line item, "Total Energy Losses" was also removed from Attachment I, because it was redundant with "Net G&T Losses" once Eklutna Line Losses were removed. Again, there was no impact on the results from these changes.

Chugach is not aware of any outstanding issues associated with this year's update.

Description of Tariff Changes

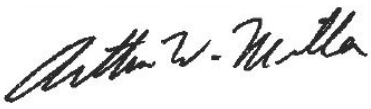
Tariff Sheet 103.4: Updated to reflect actual 2016 energy flows entering and leaving the Chugach system. Line item, "Add Line and Service Losses" and its associated "Eklutna Line Losses" was removed, reflecting the decision by the parties, due to the reconfiguration of this line segment when MEA separated from the Chugach system. The last line title, "Total Energy Losses" was changed to "Net G&T Losses".

Tariff Sheet 103.5: Updated to reflect the proposed G&T loss factors as measured at both generation and delivery. This sheet also summarizes retail distribution loss activity during 2016.

Chugach requests that the updated loss factor become effective May 1, 2017. Questions regarding the filing should be directed to Nick Horras, Manager Business Development and Key Accounts, at 762-4336.

Sincerely,

CHUGACH ELECTRIC ASSOCIATION, INC.



Arthur W. Miller
Executive Manager Regulatory and External Affairs
P.O. Box 196300
Anchorage, Alaska 99519-6300
Telephone: 907-762-4758
Arthur_Miller@chugachelectric.com

Attachments

cc: J. Foutz, City of Seward (electronic)
D. Bishop, M. Grassi, D. Heckman, Golden Valley Electric Association, Inc. (electronic)
A. Henderson, A. Thuya, Anchorage Municipal Light and Power (electronic)
T. Clark, E. Jenkin, G. Kuhn, Matanuska Electric Association, Inc. (electronic)
J. Patras, M. Peery, Homer Electric Association, Inc. (electronic)

Chugach Electric Association, Inc.

CALCULATION OF CHUGACH G&T LOSSES
2016 Test Year

Description	Q1-16	Q2-16	Q3-16	Q4-16	Total
Energy Entering System					
Beluga Power Plant	22,708.7	16,324.7	12,679.8	42,801.1	94,514.3
IGT Power Plant	5.5	12.1	82.9	0.0	100.5
Fire Island Wind (IGT Bkr 532)	15,383.1	12,349.0	7,871.9	14,158.5	49,762.5
Southcentral Power Project	348,411.3	311,166.5	291,950.4	330,093.3	1,281,621.5
Quartz Creek Substation	100,336.9	56,256.8	94,540.4	103,070.1	354,204.2
AML&P Plant 2	29,116.2	39,114.0	45,790.6	32,793.6	146,814.4
Teeland Substation	74,532.9	94,346.4	105,207.1	93,379.7	367,466.0
University Substation Bkr 152	29.1	368.6	385.0	0.0	782.7
Douglas Substation	3.3	0.1	4.6	0.3	8.2
Cooper Lake Power Plant	15,037.8	16,840.1	25,621.8	30,246.7	87,746.4
AML&P to ITSS	1,016.6	2,270.3	6,305.9	2,814.2	12,407.0
Total Energy Entering System	606,581.4	549,048.5	590,440.4	649,357.4	2,395,427.6
Energy Leaving System					
Quartz Creek Substation	0.3	563.1	626.9	2.5	1,192.8
Daves Creek Substation	15,215.8	14,308.7	15,315.3	14,212.4	59,052.1
Douglas Substation	94,045.1	142,929.4	128,656.3	114,980.1	480,611.0
AML&P Plant 2	1,011.0	28.3	193.2	83.9	1,316.4
ITSS to AML&P	16,032.8	12,175.2	8,000.1	14,251.4	50,459.5
Teeland Substation	68,511.2	52,961.7	73,627.9	67,481.9	262,582.6
University Substation Bkr 152	77,055.8	41,616.2	72,130.9	90,017.5	280,820.4
Power Plant Station Service Totals	15,073.2	12,660.8	12,668.3	15,571.7	55,973.9
Distribution Substation Deliveries	309,946.0	263,612.9	267,485.7	323,751.9	1,164,796.6
Total Energy Leaving System	596,891.2	540,856.2	578,704.5	640,353.3	2,356,805.2
Gross Energy Losses	9,690.2	8,192.3	11,735.9	9,004.1	38,622.4
Less Transformer Losses	1,331.8	1,331.8	1,331.8	1,331.8	5,327.3
Net G&T Losses	8,358.3	6,860.5	10,404.1	7,672.2	33,295.1

D
T

Tariff Advice No.: 436-8 Effective: May 1, 2017

Issued by: Chugach Electric Association, Inc.
P.O. Box 196300, Anchorage, Alaska 99519-6300

By: _____ Title: Chief Executive Officer
Lee D. Thibert

RCA 8 | 14th Revision | Sheet No. 103.5

Canceling

13th Revision | Sheet No. 103.5

Chugach Electric Association, Inc.

CALCULATION OF CHUGACH G&T LOSSES

2016 Test Year [1]

Description	Q1-16	Q2-16	Q3-16	Q4-16	Total	
Chugach Retail Distribution Losses						
Retail Receipts at Transmission Substation	309,946.0	263,612.9	267,485.7	323,751.9	1,164,796.6	
Less: Chugach House Power	1,104.9	910.4	885.5	1,281.1	4,181.9	
Net Receipts	308,841.2	262,702.5	266,600.2	322,470.8	1,160,614.7	
Retail Sales at Delivery	297,176.3	251,788.1	255,491.8	308,564.2	1,113,020.4	
Losses	11,664.9	10,914.5	11,108.3	13,906.6	47,594.3	
Add: 1/2 House Power	552.4	455.2	442.8	640.5	2,090.9	
Adj. Retail Dist. Losses	12,217.4	11,369.7	11,551.1	14,547.2	49,685.3	
At Delivery	4.111%	4.516%	4.521%	4.714%	4.464%	
At Transmission Substation	3.956%	4.328%	4.333%	4.511%	4.281%	
Adjustment of G&T Losses for House Power						
G&T Deliveries	325,164.3	277,926.0	282,805.1	337,964.3	1,223,859.7	
Net G&T Losses	8,358.3	6,860.5	10,404.1	7,672.2	33,295.1	
Add: 1/2 House Power	552.4	455.2	442.8	640.5	2,090.9	
Adjusted G&T Losses	8,910.8	7,315.6	10,846.8	8,312.8	35,386.0	
At Delivery	2.740%	2.632%	3.835%	2.460%	2.891%	I
At Generation	2.667%	2.565%	3.694%	2.401%	2.810%	I

[1] G&T loss factor effective for the allocation of actual costs beginning January 1, 2017.

Tariff Advice No.: 436-8 Effective: May 1, 2017

Issued by: Chugach Electric Association, Inc.
P.O. Box 196300, Anchorage, Alaska 99519-6300

By: Lee D. Thibert Title: Chief Executive Officer

Chugach Electric Association, Inc.
Monthly G&T Line Loss Calculation; U-99-106
In Accordance with Section 7, Black and Veatch G&T Line Loss Study
Tariff Advice No. 436-8

Values used in calculation not rounded; data formatted to show the nearest tenth of a MWh.

Measurement Point	Source[1]	Jan-16	Feb-16	Mar-16	Apr-16	May-16	Jun-16	Jul-16	Aug-16	Sep-16	Oct-16	Nov-16	Dec-16	Total 2016
Energy Entering System														
Beluga Power Plant														
Beluga 13.8 BKR 126	S	12.0	0.0	321.8	248.6	78.3	93.5	17.6	233.6	84.4	265.3	156.6	88.8	1,600.4
Beluga 13.8 BKR 226	S	65.4	913.2	262.4	262.9	552.1	440.1	36.1	448.3	228.6	128.0	282.0	192.3	3,811.4
Beluga 13.8 BKR 326	S	5,427.0	2,734.6	168.3	8,843.4	2,795.4	146.1	262.4	158.2	2,104.4	9,911.5	10,034.8	7,506.2	50,092.4
Beluga 13.8 BKR 526	S	7,371.6	5,248.4	158.7	553.3	492.8	591.9	2,601.3	2,365.1	2,215.3	3,338.5	5,749.2	5,147.8	35,833.8
Beluga 13.8 BKR 626	S	0.0	1.4	0.0	0.0	0.0	466.5	0.0	650.0	0.0	0.0	0.0	0.0	1,117.8
Beluga 13.8 BKR 726	S	0.0	24.0	0.0	0.0	215.2	544.6	502.9	771.7	0.0	0.0	0.0	0.0	2,058.4
Beluga 13.8 BKR 826	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Beluga Power Plant		12,876.0	8,921.6	911.1	9,908.2	4,133.8	2,282.7	3,420.2	4,626.9	4,632.7	13,643.3	16,222.6	12,935.1	94,514.3
IGT Power Plant														
IGT 13.8 BKR 426	S	0.0	0.0	3.3	0.00	0.00	0.0	44.4	0.00	0.00	0.0	0.0	0.0	47.7
IGT 13.8 BKR 726	S	0.0	0.0	2.2	0.00	0.00	12.1	38.5	0.00	0.00	0.0	0.0	0.0	52.8
IGT 13.8 BKR 1326	S	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00	0.00	0.0	0.0	0.0	0.0
Total IGT Power Plant		0.0	0.0	5.5	0.0	0.0	12.1	82.9	0.0	0.0	0.0	0.0	0.0	100.5
Fire Island Wind (IGT Bkr 532)	M	4,866.3	6,547.6	3,969.2	4,592.94	3,962.65	3,793.4	2,106.0	3,370.04	2,395.93	3,582.2	5,744.9	4,831.4	49,762.5
SPP														
Unit No. 1 / 10	S	18,423.0	17,185.5	18,195.1	14,955.2	17,877.4	16,210.6	15,991.0	17,082.5	16,396.4	12,882.5	16,149.5	19,037.7	200,386.5
Unit No. 2 / 11	S	21,188.6	19,695.4	20,235.1	14,957.4	19,569.4	17,728.7	17,594.1	18,154.5	16,963.9	14,843.7	21,416.2	22,509.7	224,856.9
Unit No. 3 / 12	S	21,775.0	19,846.9	20,226.6	17,957.3	19,612.9	17,704.2	17,510.8	18,166.9	16,979.6	20,269.6	21,005.7	22,646.9	233,702.5
Unit No. 4 / 13	S	21,595.4	19,643.6	20,632.0	18,124.5	19,386.5	17,597.7	17,546.6	17,845.1	22,012.1	20,820.8	20,578.3	22,863.7	238,646.2
ML&P Share	O	37,722.3	34,789.0	37,257.8	30,419.4	35,566.1	33,499.2	33,905.0	33,464.6	12,337.0	21,034.5	35,071.1	38,963.3	384,029.4
Gross Generation		120,704.3	111,160.4	116,546.6	96,413.8	112,012.3	102,740.4	102,547.6	104,713.7	84,689.1	89,851.2	114,220.8	126,021.3	1,281,621.5
Quartz Creek Substation														
Soldotna 115 SldQtzLn	M	33,306.8	22,463.6	44,566.4	25,227.4	13,487.5	17,542.0	22,572.4	33,479.4	38,488.6	37,536.3	30,273.2	35,260.6	354,204.2
Total Quartz Creek Substation		33,306.8	22,463.6	44,566.4	25,227.4	13,487.5	17,542.0	22,572.4	33,479.4	38,488.6	37,536.3	30,273.2	35,260.6	354,204.2

[1]Source of Data:
M: Metered data.
S: SCADA interval data.
O: Non-interval data.

Chugach Electric Association, Inc.
Monthly G&T Line Loss Calculation; U-99-106
In Accordance with Section 7, Black and Veatch G&T Line Loss Study
Tariff Advice No. 436-8

Values used in calculation not rounded; data formatted to show the nearest tenth of a MWh.

Measurement Point	Source[1]	Jan-16	Feb-16	Mar-16	Apr-16	May-16	Jun-16	Jul-16	Aug-16	Sep-16	Oct-16	Nov-16	Dec-16	Total 2016
AML&P Plant 2														
Plant 2 230 Yard	S	11,755.8	3,577.5	13,782.9	14,848.9	13,205.7	11,059.4	15,320.2	9,754.9	20,715.5	16,985.1	7,351.5	8,457.0	146,814.4
Total AML&P Plant 2		11,755.8	3,577.5	13,782.9	14,848.9	13,205.7	11,059.4	15,320.2	9,754.9	20,715.5	16,985.1	7,351.5	8,457.0	146,814.4
University Substation														
University Bkr 152 Import	S	0.0	29.1	0.0	29.1	339.5	0.0	379.2	1.1	4.8	0.0	0.0	0.0	782.7
Total University Bkr 152 Import		0.0	29.1	0.0	29.1	339.5	0.0	379.2	1.1	4.8	0.0	0.0	0.0	782.7
Teeland Substation														
Teeland 115 kV T1	M	0.0	552.9	0.0	4,043.8	4,410.3	0.0	88.5	0.0	0.0	125.0	0.0	0.0	9,220.5
Teeland 115 1452	M	30,827.8	11,110.9	32,041.3	27,191.7	22,555.3	36,145.3	38,540.0	29,342.5	37,236.1	36,262.2	32,745.0	24,247.5	358,245.5
Total Teeland Substation		30,827.8	11,663.8	32,041.3	31,235.5	26,965.6	36,145.3	38,628.5	29,342.5	37,236.1	36,387.3	32,745.0	24,247.5	367,466.0
Douglas Substation														
Douglas GVEA	M	1.3	1.6	0.4	0.0	0.0	0.1	4.6	0.0	0.0	0.0	0.0	0.3	8.2
Total Douglas Substation		1.3	1.6	0.4	0.0	0.0	0.1	4.6	0.0	0.0	0.0	0.0	0.3	8.2
Cooper Lake Power Plant														
Chugach CLPP	M	9,397.0	4,116.0	1,524.8	3,496.9	5,795.8	7,547.4	11,841.1	7,227.0	6,553.7	10,232.6	9,820.4	10,193.7	87,746.4
Total Cooper Lake Power Plant		9,397.0	4,116.0	1,524.8	3,496.9	5,795.8	7,547.4	11,841.1	7,227.0	6,553.7	10,232.6	9,820.4	10,193.7	87,746.4
AML&P to ITSS	S	405.0	4.7	606.9	1,893.4	276.1	100.8	1,066.3	297.7	4,942.0	2,778.7	16.4	19.1	12,407.0
Total Energy Entering System		224,140.3	168,485.9	213,955.1	187,646.1	180,179.0	181,223.4	197,968.8	192,813.3	199,658.4	210,996.7	216,394.8	221,965.9	2,395,427.6

[1]Source of Data:
M: Metered data.
S: SCADA interval data.
O: Non-interval data.

Chugach Electric Association, Inc.
Monthly G&T Line Loss Calculation; U-99-106
In Accordance with Section 7, Black and Veatch G&T Line Loss Study
Tariff Advice No. 436-8

Values used in calculation not rounded; data formatted to show the nearest tenth of a MWh.

Measurement Point	Source[1]	Jan-16	Feb-16	Mar-16	Apr-16	May-16	Jun-16	Jul-16	Aug-16	Sep-16	Oct-16	Nov-16	Dec-16	Total 2016
Energy Leaving System														
Quartz Creek Substation														
Soldotna 115 SldQtzLn	M	0.3	0.0	0.0	5.8	557.3	0.0	585.2	23.7	18.0	2.1	0.4	0.0	1,192.8
Total Quartz Creek Substation		0.3	0.0	0.0	5.8	557.3	0.0	585.2	23.7	18.0	2.1	0.4	0.0	1,192.8
Daves Creek Substation														
Daves Ck 115 BKR 952	M	5,240.5	4,954.9	5,020.4	4,683.6	4,858.9	4,766.2	5,464.0	5,279.9	4,571.3	4,612.9	4,539.2	5,060.3	59,052.1
Total Daves Creek Substation		5,240.5	4,954.9	5,020.4	4,683.6	4,858.9	4,766.2	5,464.0	5,279.9	4,571.3	4,612.9	4,539.2	5,060.3	59,052.1
Douglas Substation														
Douglas GVEA	S	37,823.1	13,240.7	38,588.3	48,191.1	48,962.8	42,260.5	45,901.4	34,630.3	44,565.4	42,693.8	38,713.2	28,892.3	464,462.6
Douglas 115 MEA	S	1,605.2	1,227.6	1,560.3	1,222.3	1,224.3	1,068.6	1,178.9	1,190.2	1,190.2	1,372.1	1,499.8	1,809.0	16,148.4
Total Douglas Substation		39,428.4	14,468.2	40,148.5	49,413.3	50,187.0	43,329.1	47,080.3	35,820.5	45,755.6	44,065.8	40,213.0	30,701.3	480,611.0
AML&P Plant 2														
Plant 2 230 Yard	S	67.6	931.7	11.7	0.0	7.2	21.1	4.9	188.3	0.0	74.9	0.3	8.8	1,316.4
Total AML&P Plant 2		67.6	931.7	11.7	0.0	7.2	21.1	4.9	188.3	0.0	74.9	0.3	8.8	1,316.4
ITSS to AML&P	S	3,970.0	9,029.1	3,033.8	3,029.3	4,561.2	4,584.7	1,981.2	4,805.1	1,213.8	1,227.8	6,472.4	6,551.2	50,459.5
Teeland Substation														
Teeland 115 kV T1	M	25,667.8	10,982.8	23,285.7	16,523.3	13,942.1	19,704.3	25,560.5	20,413.5	23,970.1	20,881.4	19,770.2	18,292.0	238,993.7
Teeland 115 1452	M	2.7	9.8	0.6	0.1	0.0	0.4	1.8	0.0	11.6	0.0	0.0	0.3	27.1
Teeland 34.5 kV Bkr 332	M	3,083.2	2,736.3	2,742.4	1,049.3	0.0	1,742.3	1,067.6	0.1	2,602.7	2,838.1	3,077.7	2,622.2	23,561.9
Total Teeland Substation		28,753.7	13,728.8	26,028.7	17,572.7	13,942.1	21,446.9	26,629.8	20,413.6	26,584.4	23,719.5	22,848.0	20,914.5	262,582.6
University Substation														
University Bkr 152 Export	S	27,485.1	19,383.5	30,187.2	15,751.2	10,181.2	15,683.8	19,814.6	26,564.6	25,751.7	29,571.9	28,902.1	31,543.5	280,820.4
Total University Bkr 152 Export		27,485.1	19,383.5	30,187.2	15,751.2	10,181.2	15,683.8	19,814.6	26,564.6	25,751.7	29,571.9	28,902.1	31,543.5	280,820.4

[1]Source of Data:
M: Metered data.
S: SCADA interval data.
O: Non-interval data.

Chugach Electric Association, Inc.
Monthly G&T Line Loss Calculation; U-99-106
In Accordance with Section 7, Black and Veatch G&T Line Loss Study
Tariff Advice No. 436-8

Values used in calculation not rounded; data formatted to show the nearest tenth of a MWh.

Measurement Point	Source[1]	Jan-16	Feb-16	Mar-16	Apr-16	May-16	Jun-16	Jul-16	Aug-16	Sep-16	Oct-16	Nov-16	Dec-16	Total 2016
Power Plant Station Service - Includes Generation Step-up (GSU) transformers losses														
Beluga Station Service	O	2,240.8	1,596.3	1,610.3	1,263.4	1,156.7	994.9	1,338.2	1,080.1	1,064.8	2,565.2	1,729.9	1,814.2	18,454.8
CLPP Station Service	O	165.7	208.7	207.4	202.7	112.0	104.0	103.4	103.7	178.0	145.5	172.9	145.8	1,849.9
IGT Station Service	O	113.6	103.8	108.9	61.8	71.2	59.5	59.8	54.9	70.9	83.2	189.0	152.7	1,129.4
SPP Station Service	O	3,010.0	2,785.5	2,922.0	2,642.3	3,044.6	2,947.7	3,027.3	3,022.9	2,564.3	2,523.4	2,883.5	3,166.3	34,539.8
Total Station Service		5,530.1	4,694.3	4,848.7	4,170.1	4,384.6	4,106.1	4,528.7	4,261.5	3,878.1	5,317.3	4,975.3	5,279.0	55,973.9
Distribution Substation Deliveries														
Univ1132	S	11,999.9	10,776.0	10,874.7	9,688.0	9,552.2	9,061.0	9,451.6	9,558.6	9,508.4	10,474.7	11,468.2	13,245.3	125,658.8
Univ1232	S	0.0	0.0	5,376.8	6,984.7	6,347.3	6,499.9	5,966.1	6,906.4	6,650.0	7,729.7	8,224.8	9,493.9	70,179.6
Univ1332	S	5,574.9	5,021.9	4,298.0	3,499.3	3,489.6	3,041.6	3,584.9	3,628.3	3,511.9	4,295.0	4,194.5	4,338.6	48,478.5
Univ 1536	S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Beluga 15 6126	S	568.7	503.3	496.9	405.9	332.2	293.3	274.9	289.2	312.9	418.5	1,419.5	596.3	5,911.7
Beluga 15 1022	M	688.7	355.4	432.7	279.0	265.2	208.9	244.1	247.0	257.4	1,647.5	1,686.4	806.4	7,118.6
IGT 34.5 332	S	357.7	323.1	319.2	265.7	246.8	237.0	241.8	238.3	241.1	313.3	355.9	405.8	3,545.7
IGT 35 732	S	11,176.1	10,161.0	7,785.0	5,669.8	5,556.7	4,551.3	4,502.4	5,009.6	4,391.3	6,308.7	5,259.9	4,023.2	74,395.0
IGT 35 832	S	9,185.5	8,462.5	9,413.4	8,189.3	8,608.9	8,010.8	8,964.6	8,455.4	8,118.2	8,671.9	8,961.7	9,697.7	104,740.1
IGT 35 1232	S	8,954.7	7,824.8	7,837.6	7,024.2	6,805.2	6,127.8	5,770.0	6,976.6	6,947.7	7,911.8	8,467.0	9,567.6	90,214.9
IGT 35 1332	S	6,329.1	5,628.8	5,599.9	4,888.6	4,675.1	4,475.4	5,033.8	5,211.9	5,187.3	6,024.0	6,529.9	9,187.7	68,771.5
IGT 35 1532	S	6,821.4	6,240.9	6,422.7	5,756.0	5,776.9	5,626.8	5,699.2	5,481.1	5,177.4	5,524.5	5,774.4	6,395.5	70,696.7
Indian 212	M	221.2	194.0	193.2	175.2	180.0	173.0	182.6	184.6	190.8	218.2	230.2	260.4	2,403.5
Girdwood 422	S	1,130.9	989.6	991.0	840.5	738.0	509.7	452.1	728.2	751.3	905.7	1,024.8	1,422.4	10,484.2
Girdwood 322	S	1,067.3	1,152.2	1,142.2	796.3	568.9	757.6	900.3	659.7	540.9	577.3	999.1	1,736.7	10,898.5
Portage 422	S	759.4	736.9	742.8	641.0	663.5	652.1	746.4	702.7	608.3	640.0	684.2	775.3	8,352.6
Postmark	S	4,565.4	4,324.4	4,529.7	4,191.1	4,351.1	4,528.5	5,312.4	4,497.8	4,231.1	4,531.5	4,536.1	4,853.9	54,452.9
Hope	S	158.8	151.1	162.4	141.7	142.8	134.9	149.4	152.2	146.6	157.5	171.7	203.5	1,872.7
Summit	M	9.5	8.7	9.1	13.4	31.8	33.2	34.2	34.8	24.7	10.5	10.2	10.2	230.4
Daves Creek	M	668.6	628.0	663.5	614.1	664.9	717.9	766.7	771.5	735.2	655.4	654.9	768.0	8,308.7
Retherford (Net of 138kV breakers)	S	39,956.7	35,772.4	33,167.9	29,677.4	30,098.3	29,121.6	30,654.1	30,874.5	30,388.7	32,387.7	35,608.4	40,251.3	397,958.9
FIW Station Service	S	14.1	15.2	8.6	6.5	3.8	3.9	5.3	11.0	8.1	12.2	17.6	17.1	123.3
Total Distribution Substation		110,208.8	99,270.1	100,467.2	89,747.6	89,099.3	84,766.0	88,937.2	90,619.4	87,929.1	99,415.7	106,279.5	118,056.7	1,164,796.6
Total Energy Leaving System		220,684.4	166,460.7	209,746.1	184,373.6	177,778.7	178,703.9	195,026.0	187,976.6	195,701.9	208,007.9	214,230.2	218,115.2	2,356,805.2
Gross Energy Losses		3,455.9	2,025.2	4,209.1	3,272.5	2,400.3	2,519.5	2,942.7	4,836.7	3,956.5	2,988.9	2,164.5	3,850.6	38,622.4

[1]Source of Data:
M: Metered data.
S: SCADA interval data.
O: Non-interval data.

Chugach Electric Association, Inc.
Monthly G&T Line Loss Calculation; U-99-106
In Accordance with Section 7, Black and Veatch G&T Line Loss Study
Tariff Advice No. 436-8

Values used in calculation not rounded; data formatted to show the nearest tenth of a MWh.

Measurement Point	Source[1]	Jan-16	Feb-16	Mar-16	Apr-16	May-16	Jun-16	Jul-16	Aug-16	Sep-16	Oct-16	Nov-16	Dec-16	Total 2016
Less Transformer Losses														
University (w/ Station Load)	O	167.3	167.3	167.3	167.3	167.3	167.3	167.3	167.3	167.3	167.3	167.3	167.3	2,008.0
Beluga	O	32.9	32.9	32.9	32.9	32.9	32.9	32.9	32.9	32.9	32.9	32.9	32.9	395.1
Indian	O	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9	71.3
Girdwood	O	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	28.8	345.2
Portage	O	23.6	23.6	23.6	23.6	23.6	23.6	23.6	23.6	23.6	23.6	23.6	23.6	283.4
Hope	O	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	27.3
Summit Lake	O	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	24.2
Daves Creek	O	16.8	16.8	16.8	16.8	16.8	16.8	16.8	16.8	16.8	16.8	16.8	16.8	201.1
International	O	164.3	164.3	164.3	164.3	164.3	164.3	164.3	164.3	164.3	164.3	164.3	164.3	1,971.7
Total Transformer Losses		279.6	279.6	279.6	279.6	279.6	279.6	279.6	279.6	279.6	279.6	279.6	279.6	5,327.3
Net G&T Losses		3,176.3	1,745.6	3,929.4	2,992.9	2,120.6	2,239.8	2,663.1	4,557.1	3,676.9	2,709.2	1,884.9	3,571.0	33,295.1

[1]Source of Data:
M: Metered data.
S: SCADA interval data.
O: Non-interval data.

Chugach Electric Association, Inc.
Monthly G&T Line Loss Calculation; U-99-106
In Accordance with Section 7, Black and Veatch G&T Line Loss Study
Tariff Advice No. 436-8

Values used in calculation not rounded; data formatted to show the nearest tenth of a MWh.

Measurement Point	Source[1]	Jan-16	Feb-16	Mar-16	Apr-16	May-16	Jun-16	Jul-16	Aug-16	Sep-16	Oct-16	Nov-16	Dec-16	Total 2016
Chugach Retail Distribution Losses														
Retail Receipts @ Trans SS		110,208.8	99,270.1	100,467.2	89,747.6	89,099.3	84,766.0	88,937.2	90,619.4	87,929.1	99,415.7	106,279.5	118,056.7	1,164,796.6
Less: Chugach House Pwr.	O	386.0	375.5	343.4	331.0	284.2	295.2	286.7	297.9	301.0	343.7	400.2	537.2	4,181.9
Net Receipts		109,822.7	98,894.6	100,123.8	89,416.6	88,815.1	84,470.8	88,650.6	90,321.5	87,628.1	99,071.9	105,879.3	117,519.5	1,160,614.7
Retail Sales @ Delivery	O	105,321.2	95,104.2	96,750.8	86,204.7	85,220.4	80,362.9	86,615.9	84,863.9	84,012.1	95,263.6	100,952.5	112,348.1	1,113,020.4
Losses		4,501.6	3,790.4	3,372.9	3,211.9	3,594.6	4,107.9	2,034.7	5,457.7	3,616.0	3,808.3	4,926.9	5,171.4	47,594.3
Add: 1/2 House Power		193.0	187.7	171.7	165.5	142.1	147.6	143.3	148.9	150.5	171.9	200.1	268.6	2,090.9
Adj. Retail Dist. Losses		4,694.6	3,978.1	3,544.6	3,377.4	3,736.7	4,255.5	2,178.0	5,606.6	3,766.5	3,980.2	5,126.9	5,440.0	49,685.3
At Delivery		4.457%	4.183%	3.664%	3.918%	4.385%	5.295%	2.515%	6.607%	4.483%	4.178%	5.079%	4.842%	4.464%
At Transmission Substation		4.275%	4.023%	3.540%	3.777%	4.207%	5.038%	2.457%	6.207%	4.298%	4.017%	4.842%	4.629%	4.281%
Adjustment of G&T Losses for House Power														
G&T Deliveries														
SES		5,240.7	4,956.2	5,021.3	4,684.6	4,860.0	4,768.5	5,465.8	5,280.8	4,572.8	4,612.9	4,539.2	5,060.3	59,063.1
RETAIL		110,208.8	99,270.1	100,467.2	89,747.6	89,099.3	84,766.0	88,937.2	90,619.4	87,929.1	99,415.7	106,279.5	118,056.7	1,164,796.6
Total Deliveries		115,449.5	104,226.3	105,488.5	94,432.2	93,959.2	89,534.5	94,403.0	95,900.2	92,501.9	104,028.6	110,818.7	123,117.0	1,223,859.7
Net G&T Losses		3,176.3	1,745.6	3,929.4	2,992.9	2,120.6	2,239.8	2,663.1	4,557.1	3,676.9	2,709.2	1,884.9	3,571.0	33,295.1
Add: 1/2 House Power		193.0	187.7	171.7	165.5	142.1	147.6	143.3	148.9	150.5	171.9	200.1	268.6	2,090.9
Adjusted G&T Losses		3,369.3	1,933.3	4,101.1	3,158.4	2,262.7	2,387.5	2,806.4	4,706.0	3,827.4	2,881.1	2,085.0	3,839.6	35,386.0
At Delivery		2.918%	1.855%	3.888%	3.345%	2.408%	2.667%	2.973%	4.907%	4.138%	2.770%	1.881%	3.119%	2.891%
At Generation		2.836%	1.821%	3.742%	3.236%	2.352%	2.597%	2.887%	4.678%	3.973%	2.695%	1.847%	3.024%	2.810%

[1]Source of Data:
M: Metered data.
S: SCADA interval data.
O: Non-interval data.

Chugach Electric Association, Inc.
Monthly G&T Line Loss Calculation; U-99-106
In Accordance with Section 7, Black and Veatch G&T Line Loss Study
Tariff Advice No. 436-8

2016 Transformer Loss Calculations - Chugach Retail System

Transformer	Size (MVA)	No Load Loss (MW)	Full Load Loss (MW)	Annual (MWh)	Load Factor	Transformer Losses at Load Factor (MW)	Annual Losses (MWh)
Beluga 1022	11.20	0.02200	0.10000	7,118.60	7%	0.023	197.85
Beluga 6126	10.00	0.02200	0.10000	5,911.67	7%	0.022	197.23
Daves Creek	10.00	0.02200	0.10000	8,308.70	9%	0.023	201.11
Girdwood	10.00	0.03100	0.14000	21,382.67	24%	0.039	345.18
Hope	1.25	0.00275	0.01250	1,872.68	17%	0.003	27.35
Indian	2.50	0.00770	0.03500	2,403.46	11%	0.008	71.32
Portage	10.00	0.03100	0.14000	8,352.61	10%	0.032	283.42
Summit	1.25	0.00275	0.01250	230.37	2%	0.003	24.20
UVSS	45.00	0.06500	0.53500	244,316.85	31%	0.116	1,019.79
UVSS Station Service Load	0.23	--	--	--	50%	0.113	988.20
International T1 [1]	75.00	0.10204	0.13187	181,827.02	28%	0.112	984.53
International T2 [1]	75.00	0.10204	0.13187	184,466.05	28%	0.112	987.14
Total							5,327.31

[1] MWh readings obtained from high side of the transformer. Excluded are MWh generated by IGT.