



RECEIVED
MAR 29 2019
PUBLIC SERVICE
COMMISSION

Gwen R. Pinson, Executive Director
Kentucky Public Service Commission
211 Sower Boulevard
Frankfort, KY 40601

**Louisville Gas and Electric
Company**
State Regulation and Rates
220 West Main Street
PO Box 32010
Louisville, Kentucky 40232
lge-ku.com

March 29, 2019

Rick E. Lovekamp
Manager Regulatory
Strategy / Policy
T 502-627-3780
Rick.lovekamp@lge-ku.com

**RE: *The Application of Louisville Gas and Electric Company for Approval
of a Permanent Statistical Meter Sampling Plan***
Case No. 2000-00278
And
***The Application of Louisville Gas and Electric Company to Implement a
Gas Regulator Inspection Program***
Case No. 2012-00491

Dear Ms. Pinson:

Enclosed please find Louisville Gas and Electric Company's Gas Meter Performance Control Program's 2018 Gas Meter Sampling Plan Results and Residential Gas Regulator Performance Control Program Report pursuant to the Commission's Orders in the above-mentioned proceedings.

Should you have any questions concerning the enclosed, please contact me at your convenience.

Sincerely,

Rick E. Lovekamp

Enclosure

LG&E

Gas Meter Sampling Plan Results

Louisville Gas and Electric Company (LG&E) Gas Meter Performance Control Program Year 2018 Gas Meter Sampling Plan Results

I. Introduction

The 2018 LG&E Gas Meter Performance Control Program required 6,282 gas meters within 125 control groups be tested and their accuracy performance documented.

Any sampled meter which proof tested beyond +/- 2% (fast or slow) was considered to be a failed meter. Of the control groups sampled during 2018, one control group(s) failed the sampling criteria. This report summarizes the results of the 2018 LG&E Gas Meter Sampling Program.

II. Meter Performance

The meter groups were separated into three capacity classifications: Meters with capacities up to and including 500 CFH (cubic feet per hour) are primarily Residential meters, meters with capacities ranging from 501 CFH to 1500 CFH are primarily Commercial meters, and meters with capacities greater than 1500 CFH are primarily Industrial meters. Table 1 summarizes control groups and meters by each capacity classification.

Table 1: Summarized Gas Meter Sampling Program

Capacity Classification	Total Control Groups*	Total Meters Targeted*	Actual Meters Tested*
Class <=500 CFH			
Single Sampling	8	796	796
Reduced Sampling	78	4,409	4,408
Class 501-1500 CFH	31	961	960
Class >1,500 CFH	8	116	116
Total for all Control Groups	125	6,282	6,280

*Includes all Control Groups and Meters including Exhaust, Prior, and Prior Year Failed Meter Control Groups

A summary of each control group, along with statistical analysis data, is shown in Appendix A. The sample control groups are arranged from low to high capacity. The definitions of selected statistical categories including the reasons for not testing a particular meter are included.

Beginning in the 2003 test year, all Commercial and Industrial Class Control Groups, regardless of whether they meet the Limit Numbers For Reduced Inspection, Table 8, under the American Standard – Sampling Procedures and Tables For Inspection By Attributes guidelines, have been placed on the Single Sampling Plan For Normal Inspection due to the small volume of meters in the Commercial Class Control Groups.

In the 2018 sampling program, 110 of the 111 sample control groups passed the sampling criteria. There were 14 non-sample controls groups that were classified as followed: two (2) control groups containing 27 meters reported as Prior Year Failed Meter control groups, and twelve (12) control groups containing 513 meters reported as 2018 Exhaust Meter control groups.

A total of thirteen (13) control groups had their remaining population removed through the sampling program in 2018; see Exhaust, Exh/Miss and FM (2016) in Appendix A.

Residential Class - Up to and including 500 CFH

The stronger performing meter control groups in this capacity continue to be the American AL175, AC250, and AL425 models. The models will remain on Residential Reduced Sampling. The Actaris/Itron Metris 250, I250 and 400A meters will remain on Residential Single Sampling. Table 2 summarizes the 2018 Fail Rate for each model.

Table 2 - Residential Fail Rate Summary*

Model Type	Total Control Groups	Sample Size	Total Failure	Fail Rate
AL175	32	1936	33	1.70%
AC250	28	1844	13	0.70%
AL425	13	416	2	0.48%
250	6	639	12	1.88%
I250	1	125	2	1.60%
400A	1	32	0	0.00%

*Does not include Exhaust, Prior, or Prior Failed Meter Control Groups
 4 Control Groups were fully exhausted in 2018

Residential Reduced Sampling Requirements

Test results from year 2018 were analyzed for the American AL175, AC250, and AL425 models to verify each model did not exceed the “Limit Numbers for Reduced Inspection”. Table 3 below confirms the models can remain on Reduced Sampling. [See Table 8 under the American Standard – Sampling Procedures and Tables for Inspection by Attributes guidelines]

Table 3 - Residential Reduced Sampling Requirement

	Model Type/Code		
	AL175 - 033 & 033A	AC250 - 078	AL425 - 015
10 Oldest Control Groups - Tested Meters	614	524	320
Reduced Testing Limit*	25	25	14
Actual Deviate Meters	14	4	2

*54.10 Gas Meter Performance Control Group
 Page 5 of 10, PSC Case 2000-00278

As reported in the 2017 Gas Meter Sample Program Report, due to prior performance, all Rockwell R175 meters (meter codes 024, 024T, and 024B) have been removed from sampling and are currently being removed in total with a target completion of December 2019. Table 4 summarizes results of the Rockwell R175 project from 2017 to current.

Table 4 – Rockwell 175 (R175) Meter Replacement Project

Year	Beginning Balance	Meters Removed & Tested	Meters Removed & DNR	Ending Balance	Within Tolerance	Failed Meters - Slow	Failed Meters - Fast	Total Failed Meters	Fail Rate (Slow/Fast)
2017	52,593	3,566	233	48,794	3,392	96	78	174	4.88%
2018	48,794	22,222	550	26,022	20,941	493	788	1,281	5.76%
Total		25,788	783		24,333	589	866	1,455	5.64%

Commercial Class - 501 CFH up to and including 1500 CFH

In general, with one control group failing this year, the hanging diaphragm commercial class control groups continue to fall within sampling tolerance levels. Table 5 summarizes the Fail Rate for each model.

Table 5 - Commercial Fail Rate Summary*

Model Type	Total Control Groups	Total Sample	Total Failure	Fail Rate
R750	7	218	2	0.92%
AL800	6	68	3	4.41%
AL1000	7	386	9	2.33%
AL1400	4	8	0	0.00%
1000A	1	32	0	0.00%

*Does not include Exhaust, Prior, or Prior Failed Meter Control Groups

6 Control Groups were fully exhausted in 2018

1 Control Group failed in 2018 (AL800 2009)

As reported in the 2017 Gas Meter Sample Program Report, due to prior performance, all #3 EMCO meters (meter codes 056) have been removed from Sampling and are currently being removed in total. Table 6 summarizes results of the meters that were removed and tested.

Table 6 - #3 EMCO Pad Meters Fail Rate Summary

Year	Beginning Balance	Meters Removed & Tested	Meters Field Tested	Meters Removed & DNR	Ending Balance	Within Tolerance	Failed Meters - Slow	Failed Meters - Fast	Total Failed Meters	Fail Rate (Slow/Fast)
2017	251	59	42	1	191	71	24	6	30	29.70%
2018	191	59	0	1	131	43	15	1	16	27.12%
Total		118	42	2		114	39	7	46	28.75%

Industrial Class - Over 1500 CFH

Industrial pad meter results continue to fluctuate year to year. As a result, pad meters are targeted for full replacement with a projected completion year of 2024. Table 7 summarizes the Fail Rate for the #4 and #10 EMCO pad meters.

Table 7 - Industrial Fail Rate Summary*

Model Type	Total Control Groups	Total Sample	Total Failure	Fail Rate
4XEMCO	2	26	3	11.54%
10MEMCO	3	12	0	0.00%

*Does not include Exhaust, Prior, or Prior Failed Meter Control Groups
3 Control Groups were fully exhausted in 2018

III. Failed Meter Control Groups Exhausted in 2018 Summary

The failed 2014 4XEMCO meter control group reported in 2016 results was completely exhausted in 2018 (within the 18 month requirement). Table 8a summarizes the failed meter group.

Table 8a: Failed Meter Group(s) Exhausted in 2018									
Rockwell 4XEMCO 2014 Control Group (Failed Meter Group Reported in 2016)									
Year	Beginning Balance	Meters Removed and Tested	Meters Removed and DNR	Ending Balance	Within Tolerance	Failed Meters - Slow	Failed Meters - Fast	Total Failed Meters	Fail Rate (Slow/Fast)
2016	52	19	0	33	16	2	1	3	15.79%
2017	33	11	0	22	10	1	0	1	9.09%
2018	22	22	0	0	16	3	3	6	27.27%
Total		52	0		42	6	4	10	19.23%

The failed 2013 10MEMCO meter control group reported in 2016 results was completely exhausted in 2018 (within the 18 month requirement). Table 8b summarizes the failed meter group.

Table 8b: Failed Meter Group(s) Exhausted in 2018									
Rockwell 10MEMCO 2013 Control Group (Failed Meter Group Reported in 2016)									
Year	Beginning Balance	Meters Removed and Tested	Meters Removed and DNR	Ending Balance	Within Tolerance	Failed Meters - Slow	Failed Meters - Fast	Total Failed Meters	Fail Rate (Slow/Fast)
2016	17	8	0	9	6	0	2	2	25.00%
2017	9	4	0	5	4	0	0	0	0.00%
2018	5	5	0	0	4	0	1	1	20.00%
Total		17	0		14	0	3	3	17.65%

IV. Prior Meters

There is one meter within the 2000 American AL425 control group (≤ 500 CFH) that will be reported in 2019 as a Prior meter.

There is one meter within the 2008 Rockwell R750 control group (501-1,500 CFH) that was due to be exhausted in 2018 that is classified as Missing. The control group will not be reported in future years.

V. Safety

As part of the LG&E Meter Sampling change-out activities, safety inspections were performed and “red-tags” were issued when deficiencies were found which resulted in a customer’s appliance being left off, branch line from the customer’s gas service left off, or the entire customer’s gas service left off until the deficiency was corrected by the customer or by LG&E. The results of these safety inspections that are directly associated with LG&E’s Meter Sampling Program are summarized in Table 9 below.

Table 9: Year 2018 Safety Inspection

Appliance Red Tag	Total
Cook stove	1
Fireplace	2
Furnace	35
Pool Heater	1
Water Heater	22
Other	1
Total	62

Additionally, Surveillance Notices were issued to correct outside deficiencies. Said deficiencies will be corrected by either the customer or by LG&E depending on ownership. The results of these surveillances directly associated with LG&E’s Meter Sampling Program are summarized in Table 10 below.

Table 10: Year 2018 Customer Surveillance Notices Issued

Type Of Customer Notice Issued	Number Issued
Corrosion / Rust On Outside Meter Loop & Associated Piping	380
Gas Piping Not Properly Supported	108
Tree / Shrubbery Growing Inside / Against Meter Loop	18
Meter Not Protected From Vehicular Damage	18
Meter Loop Too Low - In Contact With Soil / Pavement	7
No Plastic Sleeve Around Riser Going Through Pavement	0
Other	26
Total	557

VI. Year 2018 Residential Meter Sampling Savings

Table 11 highlights the estimated savings between a periodic change schedule and the LG&E Gas Meter Performance Control Program for the purchase of new/remanufactured residential class gas meters.

Table 11: 2018 Residential Class Meter Sampling Program Estimated Savings

Meter Purchase Savings: Residential Gas Meters	
Periodic Program Costs (10-year Program):	
Number of Meters under Periodic Program [1]	28,142
Unit Remanufacture Cost – Average Blended Cost	\$40.13
Residential Meter Costs Under Periodic Program	\$1,129,338
Sampling Program Costs:	
Number of Meters Tested under Sampling Program	4,992
Number of poor performing meters scrapped	796
Number of Meters for Remanufacture	4,196
Remanufactured Meters	4,196
Average Unit Remanufacture Cost – All Models	\$40.13
Remanufactured Meter Costs	\$168,385
Replacement Meters for Meters Scrapped	796
Average Replacement Meter Cost (per unit)	\$56.49
Replacement Meter Costs	\$44,966
Total Residential Meter Costs Under 2018 Program	\$213,351
Meter Cost Savings From 2018 Program	\$915,987

[1] Based on residential meters in-service at beginning of year

APPENDIX A

Control Group Data/Analysis

Statistical Definitions

MEAN

The mean is the average of all numbers.

STANDARD DEVIATION

The standard deviation is a measure of how widely values are dispersed from the average value (the mean).

SAMPLE MINIMUM AND MAXIMUM

The minimum and maximum are the values of the least and greatest elements in a sample

Notes/Acronym Explanations

Exhaust

Exhaust indicates that the gas meter lot has reached its life expectancy and all meters were removed.

Missing

Missing indicates that a gas meter in the lot cannot be found and will be excluded from future sample selections.

Exh/CGI (Exhaust/Can't Get In)

Exh/CGI indicates that the gas meter control group has reached its life expectancy and contained a gas meter with no access.

Exh/Miss (Exhaust/Missing)

Exh/Miss indicates that the gas meter control group has reached its life expectancy and contained a meter that is missing.

Exh/Prior (Exhaust/Prior)

Prior indicates that a gas meter is out of compliance with its life expectancy. Meter lots will be listed as "Exh/Prior" until all remaining meters in a particular lot are removed.

FM (Failed Meter Control Group)

FM indicates failed meter control group followed in parenthesis by the date the meter control group failed.

NT-Prior (No Test, Prior)

NT-Prior indicates meter removed, but no test for a meter that was out of compliance with its life expectancy.

LOUISVILLE GAS AND ELECTRIC COMPANY

GAS METER SAMPLING PLAN - 2018

Capacity: <= 500 CFH

SINGLE SAMPLING PLAN

														TEST RESULTS		STATISTICS					
Manufacturer	Type	Model	Install Year	Original Population	Meters Removed	Sampling	Sample Size	Meters Tested	Accept Level	Reject Level	Slow Failures	Fast Failures	Total Failures	Mean Avg Proof	Standard Deviation	Minimum	Maximum	Lot Status	Notes		
Itron	018	250	2000	416	50	Single	50	50	7	8	0	0	0	100.29	0.62	99.05	101.5	Pass			
Itron	018	250	2001	199	32	Single	32	32	5	6	0	0	0	100.09	0.62	98.8	101.6	Pass			
Itron	018	250	2002	2396	125	Single	125	125	14	15	3	1	4	99.56	0.98	93.5	102.3	Pass			
Itron	018	250	2003	3347	200	Single	200	200	21	22	3	0	3	99.39	0.76	97.05	101.8	Pass			
Itron	018	250	2004	3313	200	Single	200	200	21	22	3	1	4	99.72	0.92	97.2	103	Pass			
Itron	018T	250	2002	167	32	Single	32	32	5	6	1	0	1	99.40	0.74	97.95	101.15	Pass			
6 250 Control Groups				9838	639		639	639			10	2	12								
Itron	022	400A	2016	188	32	Single	32	32	5	6	0	0	0	100.22	0.49	98.85	101.3	Pass			
1 400A Control Groups				188	32		32	32			0	0	0								
Itron	020	1250	2016	1679	125	Single	125	125	14	15	1	1	2	100.75	0.59	97.35	103.1	Pass			
1 1250 Control Groups				1679	125		125	125			1	1	2								
<= 500 CFH Totals				11705	796		796	796			11	3	14								
8 Total Control Groups																					

LOUISVILLE GAS AND ELECTRIC COMPANY

GAS METER SAMPLING PLAN - 2018

Capacity: <= 500 CFH

REDUCED SAMPLING PLAN

														TEST RESULTS		STATISTICS					
Manufacturer	Type	Model	Install Year	Original Population	Meters Removed	Sampling	Sample Size	Meters Tested	Accept Level	Reject Level	Slow Failures	Fast Failures	Total Failures	Mean Avg Proof	Standard Deviation	Minimum	Maximum	Lot Status	Notes		
American	078	AC250	1985	582	32	Reduced	32	32	5	8	0	0	0	100.61	0.55	99.2	101.85	Pass			
American	078	AC250	1986	3041	50	Reduced	50	50	7	10	0	2	2	100.45	0.79	99	102.35	Pass			
American	078	AC250	1987	2797	50	Reduced	50	50	7	10	0	0	0	99.91	0.62	98.65	101.95	Pass			
American	078	AC250	1988	3181	50	Reduced	50	50	7	10	0	0	0	99.96	0.44	99.05	100.85	Pass			
American	078	AC250	1989	2481	50	Reduced	50	50	7	10	0	1	1	99.63	0.62	98.6	102.5	Pass			
American	078	AC250	1990	3316	80	Reduced	80	80	10	13	0	0	0	100.00	0.51	98.3	101.3	Pass			
American	078	AC250	1991	2080	50	Reduced	50	50	7	10	0	0	0	99.57	0.52	98.7	100.9	Pass			
American	078	AC250	1993	319	32	Reduced	32	32	5	8	0	0	0	100.51	0.56	99.4	101.35	Pass			
American	078	AC250	1994	1804	50	Reduced	50	50	7	10	0	0	0	100.33	0.54	99.1	101.65	Pass			
American	078	AC250	1995	3479	80	Reduced	80	80	10	13	0	1	1	100.35	0.71	98.75	102.35	Pass			
American	078	AC250	1996	8249	80	Reduced	80	80	10	13	0	0	0	100.14	0.52	98.75	101.55	Pass			
American	078	AC250	1997	7522	80	Reduced	80	80	10	13	0	2	2	100.56	0.59	99.3	102.65	Pass			
American	078	AC250	1998	5581	80	Reduced	80	80	10	13	0	0	0	100.29	0.54	98.75	101.85	Pass			
American	078	AC250	1999	3875	80	Reduced	80	80	10	13	0	0	0	100.40	0.53	99.2	101.95	Pass			
American	078	AC250	2000	4731	80	Reduced	80	80	10	13	0	0	0	100.39	0.41	99.55	101.55	Pass			
American	078	AC250	2001	4490	80	Reduced	80	80	10	13	0	0	0	100.38	0.47	99.3	101.85	Pass			
American	078	AC250	2002	1908	50	Reduced	50	50	7	10	0	0	0	100.33	0.45	99.55	101.25	Pass			
American	078	AC250	2003	1633	50	Reduced	50	50	7	10	0	0	0	100.17	0.63	98.1	101.35	Pass			
American	078	AC250	2004	3192	50	Reduced	50	50	7	10	0	1	1	100.80	0.76	99.5	102.2	Pass			
American	078	AC250	2005	6520	80	Reduced	80	80	10	13	0	2	2	100.80	0.67	99.05	102.4	Pass			
American	078	AC250	2006	5624	80	Reduced	80	80	10	13	0	1	1	100.67	0.57	98.55	102.35	Pass			
American	078	AC250	2007	4666	80	Reduced	80	80	10	13	0	2	2	100.62	0.53	99.6	102.15	Pass			
American	078	AC250	2008	6293	80	Reduced	80	80	10	13	0	0	0	100.60	0.52	99.35	101.95	Pass			
American	078	AC250	2009	6264	80	Reduced	80	80	10	13	0	1	1	100.36	0.65	98.1	102.3	Pass			

LOUISVILLE GAS AND ELECTRIC COMPANY

GAS METER SAMPLING PLAN - 2018

Capacity: <= 500 CFH

REDUCED SAMPLING PLAN

Manufacturer	Type	Model	Install Year	Original Population	Meters Removed	Sampling	Sample Size	Meters Tested	Accept Level	Reject Level	TEST RESULTS			STATISTICS				Lot Status	Notes
											Slow Failures	Fast Failures	Total Failures	Mean Avg Proof	Standard Deviation	Minimum	Maximum		
American	078	AC250	2010	2851	50	Reduced	50	50	7	10	0	0	0	99.96	0.49	98.65	101.6	Pass	
American	078	AC250	2012	3509	80	Reduced	80	80	10	13	0	0	0	100.29	0.45	98.95	101.5	Pass	
American	078	AC250	2014	5148	80	Reduced	80	80	10	13	0	0	0	100.23	0.40	99.05	101.7	Pass	
American	078	AC250	2016	6964	80	Reduced	80	80	10	13	0	0	0	100.20	0.34	99.4	101.2	Pass	
28 AC250 Control Groups				112100	1844		1844	1844			0	13	13						
American	033	AL175	1985	806	32	Reduced	32	32	5	8	0	0	0	100.70	0.60	99.15	101.75	Pass	
American	033	AL175	1986	1245	50	Reduced	50	50	7	10	1	1	2	100.07	0.92	97.35	102.1	Pass	
American	033	AL175	1987	524	32	Reduced	32	32	5	8	0	1	1	100.49	0.83	99.05	103.2	Pass	
American	033	AL175	1988	2855	50	Reduced	50	50	7	10	0	1	1	100.34	0.84	98.15	102.6	Pass	
American	033	AL175	1989	1629	50	Reduced	50	50	7	10	0	0	0	100.45	0.60	98.9	101.75	Pass	
American	033	AL175	1990	5352	80	Reduced	80	80	10	13	1	1	2	100.41	0.73	97.8	102.4	Pass	
American	033	AL175	1991	6683	80	Reduced	80	80	10	13	1	2	3	100.65	0.82	97.05	102.35	Pass	
American	033	AL175	1992	6433	80	Reduced	80	80	10	13	0	2	2	100.41	0.69	98.5	102.95	Pass	
American	033	AL175	1993	6456	80	Reduced	80	80	10	13	0	3	3	100.52	0.73	98.05	102.6	Pass	
American	033	AL175	1994	6769	80	Reduced	80	80	10	13	0	1	1	100.32	0.58	99.2	102.05	Pass	
American	033	AL175	1995	6700	80	Reduced	80	80	10	13	0	1	1	100.19	0.69	98.25	102.25	Pass	
American	033	AL175	1996	4082	80	Reduced	80	80	10	13	0	1	1	100.02	0.74	98.1	102.5	Pass	
American	033	AL175	1997	7968	80	Reduced	80	80	10	13	2	3	5	100.10	1.06	95.6	102.9	Pass	
American	033	AL175	1998	4673	80	Reduced	80	80	10	13	1	0	1	99.97	0.68	97.25	101.65	Pass	
American	033	AL175	1999	7296	80	Reduced	80	80	10	13	1	1	2	100.18	0.78	97.8	103.25	Pass	
American	033	AL175	2000	6600	80	Reduced	80	80	10	13	0	2	2	100.32	0.81	98.15	102.7	Pass	
American	033	AL175	2001	3551	80	Reduced	80	80	10	13	0	1	1	100.01	0.72	98.1	102.9	Pass	
American	033	AL175	2002	2183	50	Reduced	50	50	7	10	0	0	0	100.13	0.58	98.8	101.5	Pass	
American	033	AL175	2003	2210	50	Reduced	50	50	7	10	1	0	1	99.93	0.59	97.45	101.45	Pass	

LOUISVILLE GAS AND ELECTRIC COMPANY

GAS METER SAMPLING PLAN - 2018

Capacity: <= 500 CFH

REDUCED SAMPLING PLAN

Manufacturer	Type	Model	Install Year	Original Population	Meters Removed	Sampling	Sample Size	Meters Tested	Accept Level	Reject Level	TEST RESULTS			STATISTICS				Lot Status	Notes
											Slow Failures	Fast Failures	Total Failures	Mean Avg Proof	Standard Deviation	Minimum	Maximum		
American	033	AL175	2004	1675	50	Reduced	50	50	7	10	2	0	2	99.48	0.83	96.6	100.9	Pass	
American	033	AL175	2005	1799	50	Reduced	50	50	7	10	0	0	0	99.82	0.67	98.4	101.55	Pass	
American	033	AL175	2006	1107	32	Reduced	32	32	5	8	0	0	0	99.93	0.59	98.5	101.05	Pass	
American	033	AL175	2007	2874	50	Reduced	50	50	7	10	0	0	0	100.10	0.54	98.75	101.6	Pass	
American	033	AL175	2008	1691	50	Reduced	50	50	7	10	1	0	1	100.12	0.61	97.65	101.3	Pass	
American	033	AL175	2009	2431	50	Reduced	50	50	7	10	0	0	0	99.98	0.75	98.7	101.9	Pass	
American	033	AL175	2010	1549	50	Reduced	50	50	7	10	0	0	0	99.91	0.51	98.8	100.85	Pass	
American	033	AL175	2012	1983	50	Reduced	50	50	7	10	0	0	0	100.04	0.72	98.45	101.8	Pass	
American	033	AL175	2014	2585	50	Reduced	50	50	7	10	0	0	0	99.95	0.42	98.6	100.75	Pass	
American	033	AL175	2016	2232	50	Reduced	50	50	7	10	0	0	0	100.05	0.51	98.35	101.35	Pass	
American	033A	AL175	1992	3933	80	Reduced	80	80	10	13	0	0	0	100.35	0.64	98.1	101.7	Pass	
American	033A	AL175	1993	1456	50	Reduced	50	50	7	10	0	0	0	100.23	0.63	98.9	101.85	Pass	
American	033A	AL175	1994	2036	50	Reduced	50	50	7	10	1	0	1	100.31	0.75	97.95	101.8	Pass	
32 AL175 Control Groups				111366	1936		1936	1936			12	21	33						
American	015	AL425	1996	131	32	Reduced	32	32	5	8	0	0	0	99.73	0.64	98.85	101.2	Pass	
American	015	AL425	1997	50	50	Reduced		50											Exhaust
American	015	AL425	1998	126	32	Reduced	32	32	5	8	1	0	1	99.73	0.95	96.5	101.6	Pass	
American	015	AL425	1999	36	36	Reduced		36											Exhaust
American	015	AL425	2000	73	72	Reduced		72											Exh/CGI
American	015	AL425	2001	183	32	Reduced	32	32	5	8	0	0	0	100.01	0.50	99.15	101.4	Pass	
American	015	AL425	2002	17	17	Reduced		17											Exhaust
American	015	AL425	2003	37	37	Reduced		37											Exhaust
American	015	AL425	2004	94	32	Reduced	32	32	5	8	0	0	0	100.02	0.60	99.1	101.55	Pass	
American	015	AL425	2005	219	32	Reduced	32	32	5	8	0	0	0	100.32	0.70	98.8	101.75	Pass	

LOUISVILLE GAS AND ELECTRIC COMPANY

GAS METER SAMPLING PLAN - 2018

Capacity: <= 500 CFH

REDUCED SAMPLING PLAN

Manufacturer	Type	Model	Install Year	Original Population	Meters Removed	Sampling	Sample Size	Meters Tested	Accept Level	Reject Level	TEST RESULTS			STATISTICS				Lot Status	Notes
											Slow Failures	Fast Failures	Total Failures	Mean Avg Proof	Standard Deviation	Minimum	Maximum		
American	015	AL425	2006	283	32	Reduced	32	32	5	8	0	1	1	100.06	0.92	98.45	103.6	Pass	
American	015	AL425	2007	257	32	Reduced	32	32	5	8	0	0	0	99.99	0.49	99.2	101.8	Pass	
American	015	AL425	2008	279	32	Reduced	32	32	5	8	0	0	0	100.15	0.73	98.15	101.95	Pass	
American	015	AL425	2009	481	32	Reduced	32	32	5	8	0	0	0	100.27	0.68	99.05	101.3	Pass	
American	015	AL425	2010	451	32	Reduced	32	32	5	8	0	0	0	100.15	0.55	99.1	101.3	Pass	
American	015	AL425	2012	565	32	Reduced	32	32	5	8	0	0	0	100.32	0.44	99.75	101.75	Pass	
American	015	AL425	2014	770	32	Reduced	32	32	5	8	0	0	0	100.28	0.57	99.3	101.85	Pass	
American	015	AL425	2016	620	32	Reduced	32	32	5	8	0	0	0	100.07	0.50	99.2	101.3	Pass	
18 AL425 Control Groups				4672	628		416	628			1	1	2						
<= 500 CFH Totals				228138	4408		4196	4408			13	35	48						
78 Total Control Groups																			

LOUISVILLE GAS AND ELECTRIC COMPANY

GAS METER SAMPLING PLAN - 2018

Capacity: 501 - 1500 CFH

SINGLE SAMPLING PLAN

														TEST RESULTS		STATISTICS						
Manufacturer	Type	Model	Install Year	Original Population	Meters Removed	Sampling	Sample Size	Meters Tested	Accept Level	Reject Level	Slow Failures	Fast Failures	Total Failures	Mean Avg Proof	Standard Deviation	Minimum	Maximum	Lot Status	Notes			
Itron	017	1000A	2016	171	32	Single	32	32	5	6	0	0	0	100.30	0.42	99.55	101.35	Pass				
1 1000A Control Groups				171	32		32	32			0	0	0									
American	014	AL1000	2008	123	123	Single		123											Exhaust			
American	014	AL1000	2009	172	32	Single	32	32	5	6	2	0	2	99.75	1.09	97.7	101.75	Pass				
American	014	AL1000	2010	204	32	Single	32	32	5	6	3	0	3	99.46	1.08	96.25	101.4	Pass				
American	014	AL1000	2011	298	50	Single	50	50	7	8	2	0	2	99.36	0.87	96.1	101.2	Pass				
American	014	AL1000	2012	257	32	Single	32	32	5	6	1	0	1	99.40	0.79	96.9	100.55	Pass				
American	014	AL1000	2013	522	80	Single	80	80	10	11	0	1	1	99.97	0.73	98.2	102.8	Pass				
American	014	AL1000	2014	713	80	Single	80	80	10	11	0	0	0	100.07	0.58	98.15	101.5	Pass				
American	014	AL1000	2016	668	80	Single	80	80	10	11	0	0	0	99.96	0.50	98.35	101.3	Pass				
8 AL1000 Control Groups				2957	509		386	509			8	1	9									
American	019	AL1400	2008	1	1	Single		1											Exhaust			
American	019	AL1400	2011	1	1	Single		1											Exhaust			
American	019	AL1400	2012	9	2	Single	2	2	0	1	0	0	0	99.90	0.00	99.9	99.9	Pass				
American	019	AL1400	2013	8	2	Single	2	2	0	1	0	0	0	98.50	0.49	98.15	98.85	Pass				
American	019	AL1400	2014	9	2	Single	2	2	0	1	0	0	0	99.28	0.39	99	99.55	Pass				
American	019	AL1400	2016	14	2	Single	2	2	0	1	0	0	0	100.10	0.35	99.85	100.35	Pass				
6 AL1400 Control Groups				42	10		8	10			0	0	0									
American	076	AL800	2008	11	11	Single		11											Exhaust			
American	076	AL800	2009	32	8	Single	8	8	1	2	2	0	2	99.28	1.30	97.35	101.15	Fail				
American	076	AL800	2010	39	8	Single	8	8	1	2	0	0	0	99.73	0.88	98	100.85	Pass				
American	076	AL800	2011	56	13	Single	13	13	2	3	0	0	0	99.80	0.87	98.4	101.5	Pass				

LOUISVILLE GAS AND ELECTRIC COMPANY

GAS METER SAMPLING PLAN - 2018

Capacity: 501 - 1500 CFH

SINGLE SAMPLING PLAN

Manufacturer	Type	Model	Install Year	Original Population	Meters Removed	Sampling	Sample Size	Meters Tested	Accept Level	Reject Level	TEST RESULTS			STATISTICS				Lot Status	Notes
											Slow Failures	Fast Failures	Total Failures	Mean Avg Proof	Standard Deviation	Minimum	Maximum		
American	076	AL800	2012	88	13	Single	13	13	2	3	0	0	0	99.75	0.60	98.7	100.5	Pass	
American	076	AL800	2013	90	13	Single	13	13	2	3	1	0	1	99.78	1.06	96.9	101.1	Pass	
American	076	AL800	2014	71	13	Single	13	13	2	3	0	0	0	100.11	0.52	99.4	101.25	Pass	
American	076	AL800	2016	1	1	Single		1											Exhaust
8 AL800 Control Groups				388	80		68	80			3	0	3						
Rockwell	058	R750	2008	112	112	Single		111											Exh/Miss
Rockwell	058	R750	2009	112	20	Single	20	20	3	4	0	0	0	100.38	0.81	99.05	101.75	Pass	
Rockwell	058	R750	2010	122	20	Single	20	20	3	4	0	0	0	100.34	0.78	99	101.8	Pass	
Rockwell	058	R750	2011	181	32	Single	32	32	5	6	0	0	0	100.18	0.70	98.9	101.5	Pass	
Rockwell	058	R750	2012	165	32	Single	32	32	5	6	0	1	1	100.35	0.64	98.75	102.05	Pass	
Rockwell	058	R750	2013	230	32	Single	32	32	5	6	0	1	1	100.38	0.66	99.25	102.85	Pass	
Rockwell	058	R750	2014	258	32	Single	32	32	5	6	0	0	0	100.36	0.50	99.5	101.35	Pass	
Rockwell	058	R750	2016	345	50	Single	50	50	7	8	0	0	0	100.39	0.43	99.55	101.8	Pass	
8 R750 Control Groups				1525	330		218	329			0	2	2						
501 - 1500 CFH Totals				5083	961		712	960			11	3	14						
31 Total Control Groups																			

LOUISVILLE GAS AND ELECTRIC COMPANY

GAS METER SAMPLING PLAN - 2018

Capacity: > 1500 CFH

SINGLE SAMPLING PLAN

TEST RESULTS

STATISTICS

Manufacturer	Type	Model	Install Year	Original Population	Meters Removed	Sampling	Sample Size	Meters Tested	Accept Level	Reject Level	Slow Failures	Fast Failures	Total Failures	Mean Avg Proof	Standard Deviation	Minimum	Maximum	Lot Status	Notes
Rockwell	061	10MEMCO	2013	5	5	Single		5											FM (2016)
Rockwell	061	10MEMCO	2014	8	2	Single	2	2	0	1	0	0	0	98.88	0.11	98.8	98.95	Pass	
Rockwell	061	10MEMCO	2015	12	2	Single	2	2	0	1	0	0	0	100.83	0.60	100.4	101.25	Pass	
Rockwell	061	10MEMCO	2016	24	8	Single	8	8	1	2	0	0	0	100.23	0.85	98.45	100.95	Pass	
4 10MEMCO Control Groups				49	17		12	17			0	0	0						
Rockwell	028	4XEMCO	2013	51	51	Single		51											Exhaust
Rockwell	028	4XEMCO	2014	22	22	Single		22											FM (2016)
Rockwell	028	4XEMCO	2015	52	13	Single	13	13	2	3	2	0	2	99.61	1.58	97.2	101.9	Pass	
Rockwell	028	4XEMCO	2016	70	13	Single	13	13	2	3	1	0	1	100.13	1.63	95.45	101.85	Pass	
4 4XEMCO Control Groups				195	99		26	99			3	0	3						
> 1500 CFH Totals				244	116		38	116			3	0	3						
8 Total Control Groups																			

LG&E

Residential Gas Regulator Performance
Control Report

LOUISVILLE GAS AND ELECTRIC COMPANY 2018 RESIDENTIAL GAS REGULATOR PERFORMANCE CONTROL PROGRAM REPORT

Introduction

Louisville Gas and Electric Company's ("LG&E") Residential Gas Regulator Performance Control Program is a procedure designed to provide a continuous high level of performance of gas regulators while controlling inspection and replacement costs. A summary of the program results are being submitted pursuant to Case No. 2000-00278 and Case No. 2012-00491.

General Description of Program

LG&E's Residential Gas Regulator Performance Control Program leverages LG&E's Gas Meter Performance Control Program to test the protective capability of all classes of residential regulators. Under performance control, LG&E's residential gas regulator population is classified into homogeneous control groups representing like regulators. A control group is subject to random sample testing during LG&E's Gas Meter Performance Control Program activities. Specifically, when a meter serving a residential account is tested under the Gas Meter Performance Control Program, the associated regulator will also be tested if one is present.

2018 Sampling Criteria and Results

There were 4,588 residential regulators tested as part of the Residential Gas Regulator Performance Control Program. No regulators tested as part of the program were excluded from the sample. There were no control groups rejected as a result of the program.

Four (4) regulators were removed from service as a result of failing the "lock up" test criteria at the time of the meter sampling exchange.

Table 1 summarizes key program data broken out by control group. The control groups for which an adequate sample size was obtained in 2018 represent approximately 99% of the regulators covered by the Residential Gas Regulator Performance Control Program. The rows in the table listed in red are control groups where the sample size has yet to meet or exceed the required number. Per the Residential Gas Regulator Performance Control Program, the test period for those groups will be extended annually up to a maximum of 10 years until an adequate sample size is gathered. If an adequate sample has not been tested within 10 years, the minimum sample size will be obtained in year 11.

Table 1 – Key Program Data by Control Group

Control Groups (Manufacturer/Regulator Type)		Installed Residential Regulators as of Dec. 31, 2018	Minimum Sample Size	Sample Size (2013- 2018)	Number Passing Inspection	Number Failing Inspection/ Removed from Service	Reject Failure Level
NATIONAL (or predecessor company)	61	29	8	1	1	0	1
NATIONAL (or predecessor company)	496	30,067	200	4,822	4,815	7	74
AMERICAN METER CO.	1803	5	2	2	2	0	1
AMERICAN METER CO.	1883	138	20	25	25	0	4
AMERICAN METER CO.	1213B	54,419	200	6,579	6,577	2	98
AMERICAN METER CO.	1813B	266	32	34	34	0	6
AMERICAN METER CO.	1813C	1	1	0	0	0	1
BELGAS	P202H	1	1	0	0	0	1
ITRON (or predecessor company)	B31	59	13	10	10	0	3
ITRON (or predecessor company)	B32	0	NA	2	2	0	NA
ITRON (or predecessor company)	B34	3,912	200	1,272	1,272	0	24
ITRON (or predecessor company)	B35	1	1	0	0	0	1
ITRON (or predecessor company)	B42	219,646	200	25,546	25,537	9	475
MOONEY	MOONEY	1	1	1	1	0	1
FISHER	620	1	1	0	0	0	1
FISHER	627	2	2	1	1	0	1
FISHER	730	0	NA	1	1	0	NA
FISHER	CS400IR	17	8	0	0	0	2
FISHER	CS4800IQ	42	8	1	1	0	2
FISHER	CS820IQ	12	2	1	1	0	1
FISHER	HSR	1,821	125	253	253	0	15
FISHER	S102	10	2	1	1	0	1
FISHER	S201	1	1	0	0	0	1
FISHER	S252	35	8	4	4	0	2
FISHER	S302	216	32	99	99	0	6
ROCKWELL	143	1	1	0	0	0	1
OVERALL RESULTS		310,703		38,655		18	