

COMMONWEALTH OF KENTUCKY
BEFORE THE PUBLIC SERVICE COMMISSION

In the Matter of:

APPLICATION OF KENERGY CORP. FOR)	CASE NO.
APPROVAL OF SAMPLE METER TESTING)	2010-00034
PLAN)	

ORDER

On January 26, 2010, Kenergy Corp. ("Kenergy") applied for authority to adopt a scientific sample meter testing plan for single-phase meters in accordance with the American National Standard ANSI/ASQC Z1.9-2003. On March 5, 2010, Kenergy participated in an informal conference with Commission Staff to discuss certain issues relating to the proposed sample meter testing plan. As a result of the informal conference, Kenergy filed an amended application to its meter testing plan on April 9, 2010. Commission Staff issued a data request on April 23, 2010 to clarify issues in the amended application and, on May 4, 2010, Kenergy filed a second amended application based on its response to the data request. The matter now stands submitted for a decision on the evidentiary record.

The proposed Statistical Sampling Plan provides for the division of residential watt-hour meters into homogenous groups. Kenergy states that the meter lot composition will be based on manufacturer and type. Kenergy proposes to replace or test all meters in a failed test group within 18 months of the annual report to the Commission.

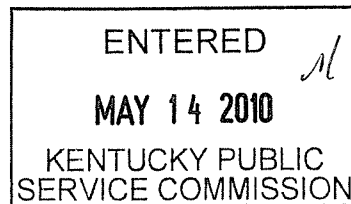
In support of its application, Kenergy states that the proposed testing plan will achieve an annual cost reduction of approximately \$138,600.

Based on the evidence of record, the Commission finds that the proposed sample meter plan is reasonable and should be approved.

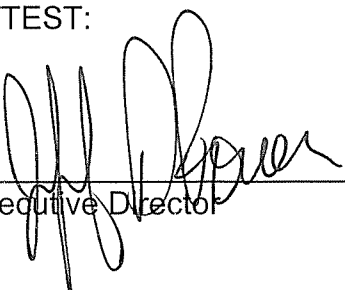
IT IS THEREFORE ORDERED that:

1. Kenergy's Application to implement a sample meter testing program for its single-phase meters as described in its second amended Application is approved.
2. The Appendix attached hereto and incorporated herein contains the proposed sample meter testing plan for Kenergy's single-phase meters.

By the Commission



ATTEST:



Executive Director

APPENDIX

APPENDIX TO AN ORDER OF THE KENTUCKY PUBLIC SERVICE
COMMISSION IN CASE NO. 2010-00034 DATED MAY 14 2010

**PROPOSED SAMPLE METER TESTING
PLAN FOR KENERGY CORP.'S SINGLE-
PHASE CLASS 200 & 320 METERS**

KENERGY CORP.
Henderson, Kentucky

Prepared by
Robert Hayden
Kenergy Corp.
&
Distribution System Solutions, Inc.

Revised
May 3, 2010

PROPOSAL FOR SINGLE-PHASE SAMPLE METER TESTING

INTRODUCTION

Kenergy Corp is an electric distribution cooperative located in western Kentucky. Kenergy is presently on schedule with its eight-year meter testing program. By adopting a sample meter testing program, Kenergy will take a significant step towards maximizing efficiency in the single-phase meter testing area of its operation. It is the purpose of this proposal to demonstrate the methods used and the cost savings achieved in sample testing.

RULES AND REGULATIONS

Kentucky Public Service Commission (PSC) rules and regulations outline the required method and techniques of sample meter testing. Kenergy will implement the sample meter testing plan as submitted in this application.

PROCEDURE

The statistical meter sample testing will follow *American National Standard Institute ANSI/ASQC Z1.9-2003 (Sampling Procedures and Tables for Inspection)*.

Each test group will be randomly sampled by a computerized process. The Kenergy billing computer system will be used for this process.

The **Acceptance Quality Level (AQL)** is defined as the quality level that is the worst tolerable product average when a continuing series of lots is submitted for acceptance sampling.

Due to the $\pm 2\%$ limits, the sample groups shall be tested using an AQL of **2.5**. This value can be found in **Table A-1**. The upper and lower 2% limits require the use of the *Double Specification Limit* method as outlined in this ANSI Standard.

PROCEDURE continued on next page.

PROCEDURE (cont.)

As shown in the table below, meters will be divided into separate homogeneous groups based upon manufacturer and type. Similar meters may be further divided by serial number break points. Newly purchased and/or installed meters will be added to the proper group and will be eligible for sample testing the following year. **Table A-2** provides the Sample Size Code Letters that are then to be referenced in **Table B-3**. The “Normal Inspection” portion of the **Table B-3** is then used to determine the sample size for each test group.

METER TEST GROUPS

Group	Manufacturer	Type	Population*	Sample
1	A.B.B./Elster	AB1	2,800	50
2	A.B.B./Elster	AB1	2,800	50
3	A.B.B./Elster	AB1	2,800	50
4	A.B.B./Elster	AB1	959	35
5	A.B.B.	AB1R	761	35
6	Sangamo/Siemens	ALALT	93	10
7	Landis & Gyr	ALF	241	15
8	Sangamo/Itron	C1S	1,345	50
9	A.B.B./Westinghouse	D4S	2,800	50
10	A.B.B./Westinghouse	D4S	2,076	50
11	A.B.B./Westinghouse	D5S	2,800	50
12	A.B.B./Westinghouse	D5S	660	35
13	Sangamo/Sensus	ISA1	98	10
14	Sangamo	I60S	422	25
15	G.E.	I70S	2,800	50
16	G.E.	I70S	2,800	50
17	G.E.	I70S	2,800	50
18	G.E.	I70S	422	25
19	Sangamo	J4ES	65	7
20	Sangamo	J4S	2,800	50
21	Sangamo	J4S	951	35
22	Sangamo/Schlumberger	J5S	2,800	50
23	Sangamo/Schlumberger	J5S	2,800	50
24	Sangamo/Schlumberger	J5S	2,800	50
25	Sangamo/Schlumberger	J5S	510	35
26	Landis & Gyr/Duncan	MQS	1,309	50
27	Landis & Gyr/Duncan	MS	2,800	50
28	Landis & Gyr/Duncan	MS	1,365	50
29	Landis & Gyr	MSE2	121	10
30	Landis & Gyr/Duncan	MSK	49	5
31	Landis & Gyr	MS2	2,800	50
32	Landis & Gyr	MS2	2,800	50
33	Landis & Gyr	MS2	564	35
34	Landis & Gyr	MX	2,800	50
35	Landis & Gyr	MX	1,950	50

***The maximum population of any group will not exceed 3,000.**

PROCEDURE continued on next page.

PROCEDURE (cont.)

Randomly selected meters (lot) from each group will be sent to the meter shop. If damaged or non-registering meters have issues that are not a manufacturer's defect or meter was exposed to abnormal conditions these meters will be replaced by another random selection.

The meters will be tested under full load, light load and 50% power factor.

Watt-hour meter shall be adjusted when the error in registration exceeds 1% at either light load or full load or when the error in registration exceeds 1% at 50 percent power factor. The meter will be retired if the registration error cannot be corrected.

For each lot, calculations will be based on the Double Specification Limit Variability Unknown-Standard Deviation Method. Full Load test results will be evaluated. **Example B-4** in *ANSI/ASQC Z1.9-2003* demonstrates this calculation method. **Table B-3** is included in this proposal.

An annual report (showing each group's performance) and a copy of the manufacturer's new meter test data will be provided.

Lot performance shall be deemed acceptable if the full-load and light-load performance of the meters within the lot meet the acceptability criteria of the ANSI standard. When a group is classified as failed and a poorly performing sub-group can be identified for separation from the original control group, the deviate sub-group will be removed from service within a 12-month period.

If, by the removal of a specific sub-group of meters, Kenergy can demonstrate that the original control group of meters now meets the acceptability standard, the remaining meters in the original control group shall remain in service.

If a deviate sub-group of meters cannot be identified to improve the control group's accuracy, then Kenergy will remove and test the entire control group of meters within 18 months once it has failed the applicable governing standard for the control group. Subgroups of the control group may be determined by evaluating the date of original purchase, date of original manufacture, and date of remanufacture. Other methods of determining subgroups may also be used.

If Kenergy should suffer an operational hardship due to this requirement, a request for deviation may be filed.

Kenergy will sample test new meters using an Inspection Level I and an AQL 1.0.

Table A-1
AQL Conversion Table

For specified AQL values falling within these ranges	Use this AQL value
- to 0.109	0.10
0.110 to 0.164	0.15
0.165 to 0.279	0.25
0.280 to 0.439	0.40
0.440 to 0.669	0.65
0.700 to 1.09	1.0
1.10 to 1.64	1.5
1.65 to 2.79	2.5
2.80 to 4.39	4.0
4.40 to 6.99	6.5
7.00 to 10.9	10.0

ANSI Part A7, Sample Selection, from the standard, states that **Inspection Level, General II**, shall be used for the discrimination level. Unless otherwise required by the PSC, this level will be in effect for the Kenergy program.

ANSI/ASQ Z1.9-2003

Table A-2¹
Sample Size Code Letters²

Lot Size		Inspection Levels				
		Special S3 S4		General I II III		
2 to	8	B	B	B	B	C
9 to	15	B	B	B	B	D
16 to	25	B	B	B	C	E
26 to	50	B	B	C	D	F
51 to	90	B	B	D	E	G
91 to	150	B	C	E	F	H
151 to	280	B	D	F	G	I
281 to	400	C	E	G	H	J
401 to	500	C	E	G	I	J
501 to	1,200	D	F	H	J	K
1,201 to	3,200	E	G	I	K	L
3,201 to	10,000	F	H	J	L	M
10,001 to	35,000	G	I	K	M	N
35,001 to	150,000	H	J	L	N	P
150,001 to	500,000	H	K	M	P	P
500,001 and	over	H	K	N	P	P

¹The theory governing inspection by variables depends on the properties of the normal distribution and, therefore, this method of inspection is only applicable when there is reason to believe that the frequency distribution is normal.

²Sample size code letters given in body of table are applicable when the indicated inspection levels are to be used.

Table B-3
 Master Table for Normal and Tightened Inspection for Plans Based on Variability Unknown
 (Double Specification Limit and Form 2—Single Specification Limit)

Sample Size Code Letter	Sample Size	Acceptance Quality Limits (normal inspection)																
		T	.10	.15	.25	.40	.65	1.00	1.50	2.50	4.00	6.50	10.00	M	M	M	M	
		M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
B	3	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
C	4	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
D	5	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
E	7	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
F	10	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
G	15	0.186	0.311	0.491	0.839	1.33	2.09	3.06	4.32	6.55	9.48	13.74	18.97	26.94	33.69	43.80	56.33	71.43
H	20	0.228	0.356	0.531	0.864	1.33	2.03	2.93	4.10	6.18	8.95	13.01	18.07	23.30	29.43	37.15	46.58	57.73
I	25	0.250	0.378	0.551	0.874	1.32	2.00	2.86	3.97	5.98	8.65	12.60	17.55	22.84	29.43	37.15	46.58	57.73
J	35	0.253	0.373	0.534	0.833	1.24	1.87	2.66	3.70	5.58	8.11	11.89	16.67	21.91	28.11	35.43	43.93	54.53
K	50	0.243	0.355	0.503	0.778	1.16	1.73	2.47	3.44	5.21	7.61	11.23	15.87	20.69	26.69	33.69	41.73	50.93
L	75	0.225	0.326	0.461	0.711	1.06	1.59	2.27	3.17	4.83	7.10	10.58	15.07	19.73	25.43	32.15	39.93	48.73
M	100	0.218	0.315	0.444	0.684	1.02	1.52	2.18	3.06	4.67	6.88	10.29	14.71	19.23	24.83	31.43	38.93	47.53
N	150	0.202	0.292	0.412	0.636	0.946	1.42	2.05	2.88	4.42	6.56	9.86	14.18	18.53	23.83	30.13	37.43	45.73
P	200	0.204	0.294	0.414	0.637	0.945	1.42	2.04	2.86	4.39	6.52	9.80	14.11	18.43	23.73	30.03	37.33	45.63
		.10	.15	.25	.40	.65	1.00	1.50	2.50	4.00	6.50	10.00						
		Acceptance Quality Limits (tightened inspection)																

All AQL values are in percent nonconforming. T denotes plan used exclusively on tightened inspection and provides symbol for identification of appropriate OC curve.

↓ Use first sampling plan below arrow; that is, both sample size as well as k value. When sample size equals or exceeds lot size, every item in the lot must be inspected.

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