

CASE

NUMBER:

99 - 441

KY. PUBLIC SERVICE COMMISSION

Index for Case: 1999-00267

AS OF : 03/06/07

Mike Little Gas Company, Inc.

Investigation - Service

COMPREHENSIVE INSPECTION

IN THE MATTER OF INVESTIGATION INTO ALLEGED VIOLATIONS OF 807 KAR 5:022, SECTIONS 10(8); 10(9); 13(17)g; 14(12); 14(13); 14(21); 14(21)b; 14(23); AND 14(25) AND 49 CRF 192.463; 192.465; 192.625(f); 192.721; 192.739; 192.743; AND, 192.747

SEQ NBR	Date	Remarks
1	07/12/99	Order entered; resp. to allegations due 8/1/99; hearing set for 9/22/99.
2	(M) 08/02/99	RESPONSE TO ORDER OF JULY 12,99 TO INSPECTION REPORT (MIKE LITTLE GAS MIKI THOMPSON)
3	08/18/99	Order scheduling 9/9 informal conference
4	09/16/99	Informal Conference Memorandum
5	(M) 09/16/99	MOTION TO CANCEL HEARING (MIKI THOMPSON MIKE LITTLE GAS CO)
6	09/20/99	Order cancelling 9/22 hearing
7	(M) 10/04/99	SUPPLEMENTAL RESPONSE (MIKE LITTLE GAS CO)
8	04/24/00	Settlement Agreement
9	(M) 05/12/00	SETTLEMENT AGREEMENT (MIKI THOMPSON/MIKE LITTLE GAS)
10	(M) 06/12/00	SETTLEMENT AGREEMENT (MIKI THOMPSON/MIKE LITTLE GAS)
11	(M) 07/31/00	LETTER ADVISING THAT COMPLIANCE SCHEDULE IS BEING FOLLOWED (MIKI THOMPSON/MIKE LITTLE GAS CO.)
12	(M) 07/31/00	LETTER TO ADVISE THAT COMPLIANCE SCHEDULE IS BEING FOLLOWED (MIKI THOMPSON/MIKE LITTLE GAS)
13	08/03/00	Settlement Agreement
14	08/04/00	FINAL ORDER APPROVING SETTLEMENT AGREEMENT
15	08/10/00	Nunc Pro Tunc Order
16	(M) 08/14/00	\$1,000.00 CHECK FOR SETTLEMENT IN PSC ORDER. (MIKE LITTLE GAS COMPANY, INC.)
17	08/28/00	Full payment receipt for \$1,000.00 payment
18	10/16/02	Order entered; reopens case; schedules 11/7/2002 informal conference; info due 11/4/2002
19	(M) 11/06/02	Miki Thompson - Mike Little Gas Company, Inc. - FAX Copy of Response to Allegations
20	11/08/02	Memorandum Regarding Informal Conference.
21	(M) 11/25/02	Miki Thompson - Mike Little Gas Company, Inc. - Response to allegations from Mike Little Gas Company Inc.
22	(M) 12/09/02	Compliance Schedule
23	01/02/03	Order entered: (1) Mike Little Gas shall conform to Compliance Schedule as approved; (2) Case shall be removed from Commission's docket
24	(M) 03/20/03	Virginia S Gibson - Mike Little Gas Company, Inc. - In compliance to Order notification of replacement of 1450 feet of 3" main line steel with 2" P.E. in the Weeksbury area beginning first week in April
25	(M) 07/14/03	Virginia S Gibson - Mike Little Gas Company, Inc. - Request for extension of time to replace remaining section of pipe from Mike Little Gas
26	08/21/03	Memorandum dated 8/15/03 for visit to office on 8/6/03.
27	08/25/03	Order entered granting motion for extension of time to comply with Compliance Schedule; Mike Little shall have until 6/1/2004 to replace the remaining 2,500 of steel pipe in the Bypro and Abner Mountain section of its system
28	(M) 05/24/04	Miki Thompson - Mike Little Gas Company, Inc. - Mike Little Gas request for extension for steel pipe replacement due to financial problems
29	06/25/04	Order entered granting Mike Little's request for an extension of time; Ordering paragraph 2 of the 8/25/03 Order is amended to permit Mike Little until 10/1/05 to replace the remaining steel pipe in its system.
30	(M) 10/04/04	Miki Thompson - Mike Little Gas Company, Inc. - Request for extension to complete project from Mike Little Gas Co
31	10/14/04	Letter to Miki Thompson in response to 9/28/2004 letter requesting an extension of time for completion of pipe replacement; extension granted to 10/1/2005

KY. PUBLIC SERVICE COMMISSION

Index for Case: 1999-00287

AS OF : 03/06/07

Jessamine-South Elkhorn Water District

Construct, Finance, Rates; 278.023

IN THE MATTER OF THE APPLICATION OF THE JESSAMINE-SOUTH ELKHORN WATER DISTRICT FOR APPROVAL TO PROCEED WITH PROJECT CONSTRUCTION PRIMARILY FINANCED BY U.S. DEPARTMENT OF AGRICULTURE AND THE U.S. DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT AND TO CHANGE RATES IN CONJUNCTION WITH SUCH PROJECT

SEQ NBR	Date	Remarks
1	07/02/99	Application.
2	07/06/99	Acknowledgement letter.
3	07/20/99	Filing deficiencies letter, response due 8/4/99.
4	07/21/99	Deficiencies cured letter
5	07/29/99	Final Order approving construction, financing and rates.
6	10/18/00	First Reminder Letter Sent.
7	(M) 11/13/00	REPLY TO LETTER OF OCTOBER 18, 2000 (JOHN HORNE/JESSAMINE SOUTH ELKHORN)

KY. PUBLIC SERVICE COMMISSION

Index for Case: 1999-00296

AS OF : 03/06/07

Verizon South, Inc.

Transfer / Sale / Purchase / Merger

OF BELL ATLANTIC CORPORATION

IN THE MATTER OF THE JOINT APPLICATION OF BELL ATLANTIC CORPORATION AND GTE CORPORATION FOR ORDER AUTHORIZING TRANSFER OF UTILITY CONTROL

SEQ NBR	Date	Remarks
1	07/09/99	Application.
2	07/12/99	Acknowledgement letter.
3	07/14/99	No deficiencies letter
4	07/15/99	Order entered setting procedural schedule; hearing set for 8/24.
5	(M) 07/15/99	PETITION FOR LEAVE TO INTERVENE (WILLIAM ATKINSON SPRINT)
6	07/16/99	Letter granting joint pet. for conf. filed 7/9/99 by GTE Corp. and Bel Atlantic.
7	07/22/99	Order granting Sprint intervention
8	(M) 07/22/99	MOTION TO INTERVENE (ANN LOUISE CHEUVRONT AG)
9	07/26/99	Data Request Order, response due 8/9/99.
10	(M) 07/26/99	FIRST DATA REQ & INTERROGATORIES (SPRINT WILLIAM ATKINSON)
11	07/29/99	Order granting Attorney General intervention
12	(M) 08/02/99	LETTER TO INFORM OF JEFFERY KISSELL TO REPLACE MR GRISWOLD (LARRY CALLISON GTE)
13	(M) 08/09/99	JOINT RESPONSE TO SPRINTS FIRST DATA REQ & INTERROGATORIES & PETITION (LARRY CALLISON GTE)
14	(M) 08/09/99	RESPONSE OF JOINT APPLICANTS TO PSC ORDER OF JULY 26,99 (LARRY CALLISON GTE)
15	(M) 08/16/99	DIRECT TESTIMONY OF DAVID REARDEN (WILLIAM ATKINSON SPRINTQ)
16	(M) 08/20/99	REBUTTAL TESTIMONY OF JOINT APPLICANTS (GTE LARRY CALLISON)
17	08/26/99	Letter granting joint pet. for conf. filed 8/9/99 by GTE Corp. and Bell Atlantic
18	08/26/99	Letter granting joint pet. for conf. filed 8/9/99 by GTE Corp. & Bell Atlantic.
19	(M) 08/30/99	BRIEF OF SPRINT COMMUNICATIONS (WILLIAM ATKINSON SPRINT)
20	(M) 08/30/99	POST HEARING BRIEF OF JOINT APPLICANTS (GTE LARRY CALLISON)
21	(M) 09/02/99	REPLY BRIEF OF SPRINT (WILLIAM ATKINSON SPRINT)
22	(M) 09/02/99	REPLY BRIEF OF JOINT APPLICANTS BELL ATLANTIC & GTE (LARRY CALLISON GTE)
23	09/07/99	FINAL ORDER APPROVING MERGER OF GTE AND BELL ATLANTIC; SUBJECT TO TERMS & COND.
24	(M) 09/17/99	MOTION FOR MODIFICATION OF ORDERING PARAGRAPH 10 OF SEPT 7,99 MERGER (LARRY CALLISON GTE)
25	(M) 10/04/99	NOTIFICATION OF MEETING SCHEDULED FOR OCT 7,99 (LARRY CALLISON GTE)
26	10/06/99	Order granting motion for modification
27	(M) 10/12/99	PETITION TO INTERVENE (EDWARD BUSCH/AT&T)
28	(M) 10/18/99	BELL ATLANTIC/GTE RESPONSE TO OPPOSITION TO AT&T INTERVENTION REQUEST (LARRY D. CALLISON/GTE SERVICE CORP)
29	11/10/99	Letter denying AT&T's petition for leave to intervene.
30	(M) 12/06/99	QUALITY PERFORMANCE REPORTS USING THE TWO PRIOR YRS AS A BENCHMARK (GTE LARRY CALLISON)
31	(M) 03/07/00	THREE REPORTS RESPONSIVE TO ORDERING PROVISION 3,4,& 8 OF PSC ORDER (GTE LARRY CALLISON)
32	(M) 03/29/00	RESPONSE TO ORDER OF SEPT 7,99 (GTE LARRY CALLISON)
33	(M) 07/11/00	RESPONSE TO COMMISSION'S ORDER OF OCTOBER 6, 1999 (LARRY CALLISON/GTE)
34	(M) 07/20/00	ADOPTION NOTICE, TARIFF (GTE LARRY CALLISON)
35	(M) 07/26/00	TARIFF FILING (PHYLLIS MASTERS/GTE)
36	(M) 07/28/00	REVISED TARIFF SHEET (PHYLLIS MASTERS/GTE)
37	(M) 09/06/00	SECOND SIX-MONTH REPORT ON BEST PRACTICES (LARRY CALLISON/VERIZON)
38	(M) 10/25/00	RESULTS FROM FCC CARRIER-TO-CARRIER PERFORMANCE PLAN (LARRY D. CALLISON/VERIZON)
39	(M) 03/06/01	THIRD SIX-MONTH REPORT ON BEST PRACTICES (LARRY CALLISON/VERIZON)

- 40 (M) 09/07/01 Larry D Callison - Verizon South, Inc. - Response to Commission's Order of September 7, 1999
- 41 (M) 03/06/02 Larry D Callison - Verizon South, Inc. - Response to Order of September 7,99 - Fifth six-month report
- 42 (M) 03/13/02 Larry D Callison - Verizon South, Inc. - Notification that Verizon has met the Promotional Resale discount maximum allowable quantity in the state
- 43 (M) 03/18/02 Larry D Callison - Verizon South, Inc. - Response to Order of September 7,99
- 44 (M) 10/11/02 Stephen R Byars - Windstream Kentucky West - Letter from ALLTELL reminding that they will not be filing requested information per Order

KY. PUBLIC SERVICE COMMISSION

Index for Case: 1999-00297

AS OF : 03/06/07

Public Gas Company, Inc.

Franchise

CITY OF CAMPTON, KENTUCKY

SEQ NBR	Date	Remarks
1	(M) 07/02/99	PETITION TO APPLY FOR FRANCHISE WITH CITY OF CAMPTON (MARK G. ENDERLE)
2	07/14/99	Notice of Intent Acknowledgement Letter.
3	07/23/99	Letter to Public Gas, enclosing sample franchise application and requirements.
4	07/30/99	Letter to Public Gas, returning proposed application; upon refiling use same #.
5	09/20/99	Letter to Public Gas enclosing gas franchise ordinance.
6	02/04/00	Letter to Company, response due 2/18 or petition will be withdrawn
7	(M) 02/08/00	LETTER CONCERNING FRANSHISE ORDINANCE (MARK ENDERLE PUBLIC GAS CO)
8	02/29/00	Letter closing case due to no petition being filed.

HISTORY INDEX FOR CASE: 1999-441
INTER-COUNTY ENERGY COOPERATIVE CORPORATION
Deviation

AEP, KU, LG&E, OWEN, SHELBY, ULH&P-METER TESTING PLAN

IN THE MATTER OF THE JOINT APPLICATION OF THE UTILITIES:
INTER COUNTY ENERGY COOPERATIVE CORP., KENTUCKY POWER
COMPANY, d/b/a AMERICAN ELECTRIC POWER, KENTUCKY UTILITIES
COMPANY, LOUISVILLE GAS AND ELECTRIC, OWEN ELECTRIC
COOPERATIVE, SHELBY ENERGY COOPERATIVE, THE UNION LIGHT,
HEAT AND POWER COMPANY COLLECTIVELY CALLED ("UTILITIES")
FOR APPROVAL OF A PILOT METER TESTING PLAN PURSUANT TO 807
KAR 5:041, SECTIONS 13, 15, 16, 17 AND 22

SEQ NBR	ENTRY DATE	REMARKS
0001	10/29/1999	Application.
0002	11/02/1999	Acknowledgement letter.
0003	12/29/1999	Data Request Order, responses from utilities due 1/21/2000.
M0001	01/21/2000	MARK OVERSTREET JOINT UTILITIES-RESPONSE TO ORDER OF DEC 29,99
0004	02/23/2000	Order sched. IC on 3/8 to discuss the utilities' responses to 12/29 Order.
0005	03/21/2000	IC Memo; comments, if any, due in 5 days.
M0002	04/17/2000	MARK OVERSTREET KY POWER-PETITION FOR CONFIDENTIAL TREATMENT
M0003	04/17/2000	MARK OVERSTREET KY POWER-RESPONSE TO DATA REQ BY PSC STAFF ON MARCH 8,00
M0004	04/17/2000	MARK OVERSTREET KY POWER-MOTION FOR LEAVE TO FILE AMENDED JOINT APPLICATION
0006	04/26/2000	Letter granting petition for conf. filed 4/17/2000 by LG&E et.al.
0007	05/05/2000	Order ent., case s/be submitted for decision unless req.for hearing filed by 5/15
M0007	05/11/2000	MARK R. OVERSTREET-SUPPLEMENTATION OF DATA RESPONSE & NOTICE OF WAIVER OF HEARING
0008	08/04/2000	Final Order giving the Utilities 20 days to file meter test plan.
M0005	08/24/2000	MARK OVERSTREET-RESPONSE TO ORDER OF AUG 4,00 REVISED AMENDED SAMPLE METER PLAN
0009	10/09/2000	Order ent.,the utilities shall file w/in 20 days a corrected Rev.Amended Plan.
M0006	10/25/2000	MARK OVERSTREET/ULH&P-RESPONSE TO COMISSION'S ORDER OF OCTOBER 9, 2000
0010	12/12/2000	Final Order accepting filing and closing case.
M0008	11/01/2001	MARTY REINERT/LG&E-LETTER REGARDING NEW SAMPLE-TESTING PLAN

SHELBY ENERGY
COOPERATIVE, INC.

RECEIVED

NOV - 9 2001

PUBLIC SERVICE
COMMISSION

Thomas M. Dorman, Executive Director
ATTN: Mr. Robert Amato
Public Service Commission
P. O. Box 615
Frankfort, KY 40601

9 November 2001

Gentlemen:

On December 12, 2000, the Public Service Commission issued an Order accepting a new sample meter testing pilot plan for participating electric utilities in Case No. 99-441. The pilot is for a period of five years. A requirement of the Commission was that the participating utilities submit an annual report.

The annual report has been submitted to John Land (PSC Electric Branch) dated October 15, 2001. We are continuing to submit quarterly meter test reports as previously required. A copy of the annual report is enclosed for your review.

If you have any questions, please do not hesitate to contact me at (502) 633-4420.

Sincerely,



David Graham
Engineering Technician

5221	39510896	41801	78050	78050	1	5	31	1	C	CHG[D2S	GBF	240	30	99.96	0.005829	9992.002
5502	42742733	40301	64690	64690	1	5	31	1	C	D3S	GBF	240	30	99.89	4.03E-05	9978.012
5518	42742719	40901	82804	82804	1	5	31	1	C	CHG[D3S	GBF	240	30	99.57	0.098379	9914.185
5929	44729073	41801	33612	33612	1	5	31	1	C	CHG[D3S	GBF	240	30	99.52	0.132244	9904.23
6135	47534003	41601	19602	19602	1	5	31	1	C	CHG[D3S	GBF	240	30	99.25	0.401517	9850.563
6225	48331946	40201	80701	80701	1	5	31	1	C	D3S	GBF	240	30	99.74	0.020636	9948.068
6265	48445311	42401	80068	80068	1	5	31	1	C	CHG[D3S	GBF	240	30	97.56	5.399367	9517.954
6324	48555719	41101	63370	63370	1	5	31	1	C	CHG[D3S	GBF	240	30	99.12	0.583167	9824.774
6437	52101235	42001	82531	82531	1	5	31	1	C	D4S	GBF	240	30	99.83	0.002879	9966.029
6630	52745172	50401	23183	23183	1	5	31	1	C	D4S	GBF	240	30	100.24	0.126983	10048.06
6811	53922007	40501	67264	67264	1	5	31	1	C	D4S	GBF	240	30	100.02	0.01859	10004
6830	54019516	42401	69645	69645	1	5	31	1	C	CHG[D4S	GBF	240	30	99.49	0.154963	9898.26
7270	56029152	50201	92623	92623	1	5	31	1	C	METED4S	GBF	240	30	100.22	0.113129	10044.05
8558	58207346	51001	43852	43852	1	5	21	1	C	METED4S	GBF	120	15	100.53	0.417763	10106.28
9745	61717292	41101	79325	79325	1	5	31	1	C	D4S	GBF	240	30	100.11	0.051233	10022.01
9783	61717011	42501	13766	13766	1	5	31	1	C	D4S	GBF	240	30	100.11	0.051233	10022.01
9796	61716911	41001	70100	70100	1	5	31	1	C	D4S	GBF	240	30	100.89	1.012733	10178.79
12136	65843642	40301	1944	1944	1	5	31	1	C	D4S	GBF	240	30	99.71	0.030156	9942.084
12142	65843254	50901	30651	30651	1	5	31	1	C	D4S	GBF	240	30	102.3	5.838729	10465.29
12172	65843616	50401	25624	25624	1	5	31	1	C	D4S	GBF	240	30	100.74	0.733329	10148.55
12189	65843636	40901	41608	41608	1	5	31	1	C	D4S	GBF	240	30	100.18	0.087821	10036.03
12201	65843630	40901	20355	20355	1	5	31	1	C	D4S	GBF	240	30	99.53	0.125071	9906.221
12208	64908082	40201	29257	29257	1	5	31	1	C	D4S	GBF	240	30	99.97	0.007456	9994.001
12777	66052267	41101	58680	58680	1	5	31	1	C	D4S	GBF	240	30	100.53	0.417763	10106.28
12795	67019251	42501	14819	14819	1	5	31	1	C	D4S	GBF	240	30	99.98	0.009283	9996
12816	66051504	42301	15265	15265	1	5	31	1	C	D4S	GBF	240	30	99.93	0.002148	9986.005
12824	66054844	41601	38220	38220	1	5	31	1	C	D4S	GBF	240	30	100.35	0.217479	10070.12
12845	66032902	51701	95610	95611	1	5	31	1	C	D4S	DRG	240	30	99.5	0.14719	9900.25
12851	66051747	42301	30471	30471	1	5	31	1	C	D4S	GBF	240	30	100.84	0.914598	10168.71
12857	66122989	40901	62931	62931	1	5	31	1	C	D4S	GBF	240	30	100.62	0.542206	10124.38
12859	66122549	41701	35190	35190	1	5	31	1	C	D4S	GBF	240	30	100.35	0.217479	10070.12
12877	66054818	41901	95587	95587	1	5	31	1	C	D4S	GBF	240	30	100.02	0.01859	10004
12915	66052859	40601	6743	6743	1	5	31	1	C	D4S	GBF	240	30	100.25	0.13421	10050.06
12980	66053907	40201	18703	18703	1	5	31	1	C	D4S	GBF	240	30	99.51	0.139617	9902.24
13005	66053919	41701	45582	45582	1	5	31	1	C	CHG[D4S	GBF	240	30	99.88	1.34E-05	9976.014
13025	66053909	41701	48412	48412	1	5	31	1	C	D4S	GBF	240	30	100	0.013536	10000
13083	67633833	50301	11943	11943	1	5	31	1	C	D4S	GBF	240	30	99.97	0.007456	9994.001
13089	67634436	42001	55185	55185	1	5	31	1	C	D4S	GBF	240	30	99.76	0.01529	9952.058
13099	67633050	41701	55960	55960	1	5	31	1	C	D4S	GBF	240	30	99.05	0.694979	9810.903
13171	67634124	42301	30540	30540	1	5	31	1	C	CUT-D4S	GBF	240	30	100.2	0.100075	10040.04
13201	67633862	40201	69320	69320	1	5	31	1	C	D4S	GBF	240	30	99.58	0.092206	9916.176
13220	67634513	41601	47890	47890	1	5	31	1	C	D4S	GBF	240	30	100.4	0.266613	10080.16
13227	67632977	41801	44154	44154	1	5	31	1	C	D4S	GBF	240	30	100.15	0.07094	10030.02
13239	67634509	51001	7542	7542	1	5	31	1	C	METED4S	GBF	240	30	99.72	0.026783	9944.078
13696	67948421	42501	33710	33710	1	5	31	1	C	D4S	GBF	240	30	100.12	0.05586	10024.01
13725	67948366	42701	11190	11190	1	5	31	1	C	CHG[D4S	GBF	240	30	95.96	15.39506	9208.322
13748	69940733	42701	35694	35694	1	5	31	1	P	DEM D4SM	GBF	240	30	99.53	0.125071	9906.221
13764	69420457	40601	35894	35894	1	5	31	1	C	CHG[D4S	GBF	240	30	99.66	0.050021	9932.116
13818	67948364	50901	82217	82217	1	5	31	1	C	D4S	GBF	240	30	99.3	0.34	9860.49
14132	69420407	42001	21931	21931	1	5	31	1	C	D4S	GBF	240	30	99.83	0.002879	9966.029
14230	69410592	50401	14248	14248	1	5	31	1	C	D4S	GBF	240	30	100.12	0.05586	10024.01
14275	69410578	40601	71006	71006	1	5	31	1	C	D4S	GBF	240	30	100.36	0.226906	10072.13

Year :2001 Total Meters in Group : 1286

Total Meters Tested : 52

Max Allowalbe % (Table B-3) : 5.21

Table B-5 (upper) : 0.428

Table B-5 (lower) : 1.011

5193.95 35.71401 518826.4

Standard Deviation : 0.828739

Avg: 99.8837

Quality Index (upper) : 2.5537

Quality Index (lower) : 2.27292 Group #1: PASS

14404	72651264	40601	12309	12309	2	5	31	1	C	C†	D5S	GBF	240	30	99.61	0.173757	9922.152	
14438	72651543	41701	29428	29428	2	5	31	1	C		D5S	GBF	240	30	99.92	0.011415	9984.006	
14441	72651546	41001	76017	76017	2	5	31	1	C	C†	D5S	GBF	240	30	99.37	0.431442	9874.397	
14468	72651241	42401	43854	43854	2	5	31	1	C		D5S	GBF	240	30	100.02	4.68E-05	10004	
14725	81100248	42701	37131	37131	2	5	31	1	C		D5S	GBF	240	30	100.23	0.041273	10046.05	
15005	75216012	41601	52030	52030	2	5	31	1	C		D5S	GBF	240	30	100.4	0.139247	10080.16	
15012	75215985	41901	9930	9930	2	5	31	1	C		D5S	GBF	240	30	99.48	0.299036	9896.27	
15019	75218143	42001	42781	42781	2	5	31	1	C		D5S	GBF	240	30	99.41	0.380494	9882.348	
15045	75215896	40901	66152	66152	2	5	31	1	C		D5S	GBF	240	30	100.4	0.139247	10080.16	
15947	76727215	40501	60540	60540	2	5	31	1	C		D5S	GBF	240	30	99.35	0.458115	9870.423	
16004	76727222	50801	16370	16370	2	5	31	1	C		D5S	GBF	240	30	99.59	0.190831	9918.168	
16021	76727289	42701	22128	22128	2	5	31	1	C	C†	D5S	GBF	240	30	98.79	1.529778	9759.464	
16459	76727189	50201	53454	53454	2	5	31	1	C		D5S	GBF	240	30	99.81	0.04702	9962.036	
16470	76727169	40201	58677	58677	2	5	31	1	C		D5S	GBF	240	30	100.09	0.003989	10018.01	
16476	76727116	40901	92395	92395	2	5	31	1	C		D5S	GBF	240	30	99.66	0.134573	9932.116	
16513	76727196	42601	21603	21603	2	5	31	1	C		D5S	GBF	240	30	100.32	0.085942	10064.1	
16691	80933822	50901	23298	23298	2	5	31	1	C		D5S	GBF	240	30	100.07	0.001863	10014	
16694	80933881	51001	60842	60842	2	5	31	1	C		D5S	GBF	240	30	100.07	0.001863	10014	
16697	80933769	40201	4590	4590	2	5	31	1	C		D5S	GBF	240	30	100.4	0.139247	10080.16	
16704	81100175	40201	7106	7106	2	5	31	1	C		D5S	GBF	240	30	99.94	0.007542	9988.004	
16721	81100209	40501	49769	49769	2	5	31	1	C		D5S	GBF	240	30	100.06	0.001099	10012	
16730	81100204	50801	1220	1220	2	5	31	1	C		D5S	GBF	240	30	100.62	0.351836	10124.38	
16745	80929288	50901	96591	96591	2	5	31	1	C		D5S	GBF	240	30	100.24	0.045436	10048.06	
16761	81100179	42301	36547	36547	2	5	31	1	C		D5S	GBF	240	30	100.04	0.000173	10008	
17085	82430760	50801	60187	60187	2	5	31	1	C		D5S	GBF	240	30	100.7	0.453142	10140.49	
17138	82430709	40301	67730	67730	2	5	31	1	C		D5S	GBF	240	30	100.44	0.170699	10088.19	
17494	82430738	41201	62098	62098	2	5	31	1	C		D5S	GBF	240	30	100.23	0.041273	10046.05	
17597	83836408	41201	37700	37700	2	5	31	1	C		D5S	GBF	240	30	100.26	0.054363	10052.07	
17610	83836431	41701	8331	8331	2	5	31	1	C		D5S	GBF	240	30	100.34	0.098068	10068.12	
17625	83836386	40901	92525	92525	2	5	31	1	C		D5S	GBF	240	30	100.2	0.029984	10040.04	
17668	83836380	42301	5818	5818	2	5	31	1	C		D5S	GBF	240	30	100.47	0.196389	10094.22	
17731	83836591	41101	20775	20775	2	5	31	1	C	C†	D5S	GBF	240	30	99.86	0.027836	9972.02	
19556	89124799	42601	22567	22567	2	5	31	1	P		AB1	GBF	240	30	99.78	0.060931	9956.048	
19588	89124820	42501	69555	69555	2	5	31	1	P		AB1	GBF	240	30	100.5	0.223878	10100.25	
19596	89124796	41601	85348	85348	2	5	31	1	P		AB1	GBF	240	30	99.97	0.003231	9994.001	
19608	89124809	40901	70526	70526	2	5	31	1	P		AB1	GBF	240	30	99.73	0.088115	9946.073	
19684	89125292	50301	62236	62236	2	5	31	1	P		AB1	GBF	240	30	100.16	0.017731	10032.03	
19703	89125194	40901	306	306	2	5	31	1	P		AB1	GBF	240	30	100.49	0.214515	10098.24	
Year :2001 Total Meters in Group :															1016	3801.02	6.295421	380210.3
Total Meters Tested :															38	Standard Deviation :		
Max Allowalbe % (Table B-3) :															5.58	Avg:		
Table B-5 (upper) :															0	Quality Index (upper) :		
Table B-5 (lower) :															0	Quality Index (lower) :		
																Group #2: PASS		

5430	11026967	42401	60250	60250	3	5	31	1 C	CHGC MQS GBF	240	30	99.01	0.651953	9802.98
5437	11026713	40901	78370	78370	3	5	31	1 C	MQS GBF	240	30	100.19	0.138804	10038.04
5616	11405370	42001	47290	47290	3	5	31	1 C	CHGC MQS GBF	240	30	97.86	3.831555	9576.58
5619	11366231	41701	10810	10810	3	5	31	1 C	CHGC MQS GBF	240	30	100.08	0.06894	10016.01
5787	11807959	50901	41210	41210	3	5	31	1 C	CHGC MQS GBF	240	30	100.84	1.045637	10168.71
5851	12012213	40201	5490	5490	3	5	31	1 C	MQS GBF	240	30	99.91	0.008568	9982.008
5916	12156729	41901	1330	1330	3	5	31	1 C	CHGC MQS GBF	240	30	98.72	1.204366	9745.638
5917	12156726	41801	7710	7710	3	5	31	1 C	CHGC MQS GBF	240	30	99.65	0.028035	9930.123
5968	11863649	50401	7608	7608	3	5	31	1 C	MQS GBF	120	15	100.5	0.465894	10100.25
5993	12228273	41901	72860	72860	3	5	31	1 C	CHGC MQS GBF	240	30	100.56	0.551401	10112.31
6273	13382156	42001	19350	19350	3	5	31	1 C	CHGC MQS GBF	240	30	100.19	0.138804	10038.04
6651	14094253	41001	98497	98497	3	5	31	1 C	CHGC MQS GBF	240	30	99.35	0.218496	9870.423
6898	15055150	50401	46226	46226	3	5	31	1 C	MS GBF	240	30	99.7	0.013791	9940.09
6900	15055133	41801	98609	98609	3	5	31	1 C	MS GBF	240	30	99.74	0.005996	9948.068
7064	15718971	41101	37635	37635	3	5	31	1 C	MS GBF	240	30	99.7	0.013791	9940.09
7166	15824722	40601	40933	40933	3	5	31	1 C	MS GBF	240	30	99.79	0.000753	9958.044
7176	15824692	41601	38730	38730	3	5	31	1 C	MS GBF	240	30	100.28	0.213966	10056.08
7189	15824723	41101	1437	1437	3	5	31	1 C	MS GBF	240	30	99.2	0.381227	9840.64
7269	16036682	50301	96784	96784	3	5	31	1 C	MS GBF	240	30	100.18	0.131453	10036.03
7319	16184794	41201	98458	98458	3	5	31	1 C	MS GBF	240	30	99.64	0.031483	9928.13
7413	16151973	42501	53018	53018	3	5	31	1 C	MS GBF	240	30	99.84	0.000509	9968.026
8527	17521447	41001	20068	20068	3	5	31	1 C	MS GBF	240	30	99.19	0.393676	9838.656
8529	17515593	40901	10245	10245	3	5	31	1 C	SERV MS GBF	240	30	100.71	0.796671	10142.5
8551	17516171	42401	35771	35771	3	5	31	1 C	MS GBF	240	30	99.95	0.017573	9990.003
11424	21921125	40201	80773	80773	3	5	31	1 C	MS GBF	240	30	100.03	0.045183	10006
11433	21914933	42301	99200	99200	3	5	31	1 C	MS GBF	240	30	99.86	0.001812	9972.02
11458	21914999	50201	58790	58790	3	5	31	1 C	MS GBF	240	30	99.91	0.008568	9982.008
11465	21914622	40501	96616	96616	3	5	31	1 C	MS GBF	240	30	99.97	0.023276	9994.001
11471	21921049	42701	21177	21177	3	5	31	1 C	MS GBF	240	30	99.31	0.257491	9862.476
11480	21921091	40501	98534	98534	3	5	31	1 C	MS GBF	240	30	100.38	0.316478	10076.14
11482	21921092	40201	97147	97147	3	5	31	1 C	MS GBF	240	30	99.39	0.182701	9878.372
11493	21921109	41601	81310	81310	3	5	31	1 C	CHGC MS GBF	240	30	99.84	0.000509	9968.026
11508	21921108	42301	24108	24108	3	5	31	1 C	MS GBF	240	30	99.98	0.026427	9996
11518	21914640	41801	30605	30605	3	5	31	1 C	MS GBF	240	30	99.83	0.000158	9966.029
11528	21914919	42701	50683	50683	3	5	31	1 C	METE MS GBF	240	30	100.29	0.223317	10058.08
11544	21914986	50901	71495	71495	3	5	31	1 C	MS GBF	240	30	100.08	0.06894	10016.01
11566	21914969	50101	60733	60733	3	5	31	1 C	MS GBF	240	30	99.64	0.031483	9928.13
11658	21921291	41101	87675	87675	3	5	31	1 C	MS GBF	240	30	99.81	5.53E-05	9962.036
11671	21914862	42501	55683	55683	3	5	31	1 C	MS GBF	240	30	99.78	0.001401	9956.048

Year :2001 Total Meters in Group : 668
 Total Meters Tested : 39
 Max Allowalbe % (Table B-3) : 5.58
 Table B-5 (upper) : 0
 Table B-5 (lower) : 0.013

3892.88 11.54114 388588.8
 Standard Deviation : 0.543992
 Avg: 99.81744
 Quality Index (upper) : 4.012129
 Quality Index (lower) : 3.340927 **Group #3: PASS**

17411	34963024	42601	63705	63705	4	5	31	1	C	MS	GBF	240	30	100.18	0.102038	10036.0324
17528	34963022	50801	73515	73515	4	5	31	1	C	MS	GBF	240	30	99.98	0.014264	9996.0004
17776	37551807	42401	1640	1640	4	5	31	1	C	MS	GBF	240	30	99.8	0.003668	9960.04
17779	37551808	42001	5888	5888	4	5	31	1	C	MS	GBF	240	30	100.17	0.095749	10034.0289
17797	37553298	50201	17113	17113	4	5	31	1	C	MS	GBF	240	30	99.99	0.016753	9998.0001
17803	37553312	41801	82912	82912	4	5	31	1	C	MS	GBF	240	30	100.24	0.14397	10048.0576
17812	37553308	42301	1478	1478	4	5	31	1	C	MS	GBF	240	30	99.77	0.008202	9954.0529
17903	37560074	42301	94105	94105	4	5	31	1	C	MS	GBF	240	30	99.76	0.010114	9952.0576
17961	37555117	50901	72422	72422	4	5	31	1	C	MS	GBF	240	30	100.05	0.035885	10010.0025
17998	38721921	42001	78900	78900	4	5	31	1	C	MS	GBF	240	30	100.14	0.078083	10028.0196
18025	38810028	51401	1271	1271	4	5	31	1	C	MS	DRG	240	30	100	0.019442	10000
18033	38810050	40901	84582	84582	4	5	31	1	C	MS	GBF	240	30	100.13	0.072595	10026.0169
18042	38815670	40301	46480	46480	4	5	31	1	C	MS	GBF	240	30	100.15	0.083772	10030.0225
18175	39402553	42601	712	712	4	5	31	1	P	MS	GBF	240	30	99.98	0.014264	9996.0004
18230	39403585	42701	85203	85203	4	5	31	1	P	MS	GBF	240	30	100.42	0.312966	10084.1764
18231	39403586	50201	25718	25718	4	5	31	1	P	MET MS	GBF	240	30	100.14	0.078083	10028.0196
18501	39768801	41601	44268	44268	4	5	31	1	C	MS	GBF	240	30	100.11	0.062217	10022.0121
18547	39768806	40901	82267	82267	4	5	31	1	C	MS	GBF	240	30	100.22	0.129193	10044.0484
18661	39768819	42401	45809	45809	4	5	31	1	C	MS	GBF	240	30	100.14	0.078083	10028.0196
18662	39776306	40501	1308	1308	4	5	31	1	C	MS	GBF	240	30	100.15	0.083772	10030.0225
18715	38811034	40301	65756	65756	4	5	31	1	P	MX	GBF	240	30	99.69	0.029093	9938.0961
18824	38811256	41201	80115	80115	4	5	31	1	P	MX	GBF	240	30	99.75	0.012225	9950.0625
18827	38811091	42601	4425	4425	4	5	31	1	P	MX	GBF	240	30	99.54	0.102763	9908.2116
18884	38811074	42001	96790	96790	4	5	31	1	P	MX	GBF	240	30	99.71	0.02267	9942.0841
18904	38810994	40601	11560	11560	4	5	31	1	P	MX	GBF	240	30	99.44	0.176876	9888.3136
18941	38811264	40201	62314	62314	4	5	31	1	P	MX	GBF	240	30	99.89	0.000866	9978.0121
18972	38811081	42401	89497	89497	4	5	31	1	P	MX	GBF	240	30	99.65	0.044338	9930.1225
18994	38811242	40901	77601	77601	4	5	31	1	P	MX	GBF	240	30	99.76	0.010114	9952.0576
19222	39402507	40901	34517	34517	4	5	31	1	P	MS	GBF	240	30	100.15	0.083772	10030.0225
19447	39959962	41101	289	289	4	5	31	1	p	MX	GBF	240	30	100.03	0.028708	10006.0009
19455	39959970	51001	32551	32551	4	5	31	1	P	MX	GBF	240	30	99.88	0.000378	9976.0144
19459	39959898	40201	65792	65792	4	5	31	1	P	MX	GBF	240	30	100.01	0.022331	10002.0001
19467	39959889	42401	1235	1235	4	5	31	1	P	MX	GBF	240	30	99.55	0.096451	9910.2025
19484	39959938	42501	86343	86343	4	5	31	1	P	MX	GBF	240	30	99.93	0.004821	9986.0049
19487	39959932	42701	79201	79201	4	5	31	1	P	MX	GBF	240	30	99.41	0.20301	9882.3481
19514	39959907	40501	92597	92597	4	5	31	1	P	MX	GBF	240	30	99.75	0.012225	9950.0625
20649	56610006	42501	1308	1308	4	5	31	1	P	HANI MX	GBF	240	30	99.72	0.019759	9944.0784
20663	56609962	50101	77226	77226	4	5	31	1	P	MX	GBF	240	30	99.5	0.130008	9900.25
20752	56610102	40601	3096	3096	4	5	31	1	P	MX	GBF	240	30	99.29	0.325546	9858.5041
20790	56610145	40201	38099	38099	4	5	31	1	P	MX	GBF	240	30	99.72	0.019759	9944.0784
20794	56610051	51001	39398	39398	4	5	31	1	P	MX	GBF	240	30	98.83	1.062066	9767.3689
20804	56609999	50801	79115	79115	4	5	31	1	P	MX	GBF	240	30	99.99	0.016753	9998.0001
21262	58111160	40501	8017	8017	4	5	31	1	P	MX	GBF	240	30	99.68	0.032604	9936.1024
21279	58111157	41601	4930	4930	4	5	31	1	P	MX	GBF	240	30	99.89	0.000866	9978.0121
21283	58111149	50301	35557	35557	4	5	31	1	P	MX	GBF	240	30	100.03	0.028708	10006.0009
21331	58111305	42601	7749	7749	4	5	31	1	P	MX	GBF	240	30	99.89	0.000866	9978.0121
21397	58361131	50301	23347	23347	4	5	31	1	P	MX	GBF	240	30	99.86	3.2E-07	9972.0196
21418	58361128	41101	18200	18200	4	5	31	1	P	MX	GBF	240	30	100	0.019442	10000
21435	58361166	41001	2988	2988	4	5	31	1	p	MX	GBF	240	30	100.08	0.048151	10016.0064
21456	58361195	42301	7076	7076	4	5	31	1	P	MX	GBF	240	30	99.65	0.04	9930.1225
21497	58361236	40601	7507	7507	4	5	31	1	P	MX	GBF	240	30	99.65	0.044338	9930.1225
21498	58361233	41701	24517	24517	4	5	31	1	P	MX	GBF	240	30	99.69	0.029093	9938.0961
21562	58361288	41001	1503	1503	4	5	31	1	P	MX	GBF	240	30	99.48	0.144831	9896.2704

Year :2001 Total Meters in Group : 1782
 Total Meters Tested : 53
 Max Allowalbe % (Table B-3) : 5.21
 Table B-5 (upper) : 0
 Table B-5 (lower) : 0

Standard Deviation : 0.283538
 Avg: 99.8606
 Quality Index (upper) : 7.54548
 Quality Index (lower) : 6.56195 **Group #4: PASS**

5286	44600468	41901	97215	97215	5	5	31	1	C	160S	GBF	240	30	100.45	0.150372	10090.2
5421	45163854	50101	88244	88244	5	5	31	1	C	160S	GBF	240	30	99.81	0.063616	9962.036
5469	45334484	50801	65164	65164	5	5	31	1	C	160S	GBF	240	30	100.2	0.018983	10040.04
5471	45638208	42601	82344	82344	5	5	31	1	C	160S	GBF	240	30	100.06	4.94E-06	10012
5586	45960510	42401	55431	55431	5	5	31	1	C	160S	GBF	240	30	100.23	0.028149	10046.05
7132	56080807	50401	10167	10167	5	5	31	1	C	170S	GBF	240	30	100.39	0.107438	10078.15
10578	63978944	42401	7264	7264	5	5	31	1	C	CUT-170S	GBF	240	30	100.05	0.000149	10010
10812	65368639	40601	25492	25492	5	5	31	1	C	170S	GBF	240	30	100.16	0.00956	10032.03
10819	65368618	41001	68752	68752	5	5	31	1	C	170S	GBF	240	30	99.98	0.00676	9996
10847	65368644	41701	51936	51936	5	5	31	1	C	REPL 170S	GBF	240	30	99.76	0.091338	9952.058
10850	65368719	40901	89854	89854	5	5	31	1	C	170S	GBF	240	30	100.3	0.056538	10060.09
10884	65368673	41601	93614	93614	5	5	31	1	C	170S	GBF	240	30	100.41	0.120949	10082.17
10889	65368632	40301	39674	39674	5	5	31	1	C	170S	GBF	240	30	100.43	0.13526	10086.18
10890	65368633	40501	71813	71813	5	5	31	1	C	170S	GBF	240	30	100.4	0.114094	10080.16
10908	65523621	42501	59741	59741	5	5	31	1	C	170S	GBF	240	30	100.25	0.03526	10050.06
11726	68512870	42601	28385	28385	5	5	31	1	C	170S	GBF	240	30	99.94	0.014938	9988.004
11795	68512928	40301	8919	8919	5	5	31	1	C	170S	GBF	240	30	100.33	0.071705	10066.11
11984	69474778	42301	25092	25092	5	5	31	1	C	170S	GBF	240	30	100.45	0.150372	10090.2
14306	75807425	50301	45223	45223	5	5	31	1	C	METE 170S	GBF	240	30	100.1	0.001427	10020.01
14331	75807395	40501	45060	45060	5	5	31	1	C	170S	GBF	240	30	100.29	0.051883	10058.08
14902	76131208	41901	73386	73386	5	5	31	1	C	170S	GBF	240	30	100.23	0.028149	10046.05
14907	76130759	50301	88544	88544	5	5	31	1	C	170S	GBF	240	30	100.28	0.047427	10056.08
15113	78542826	42701	52505	52505	5	5	31	1	C	170S	GBF	240	30	99.94	0.014938	9988.004
15119	78543012	50401	96534	96534	5	5	31	1	C	170S	GBF	240	30	100.01	0.002727	10002
15127	78542712	41701	87264	87264	5	5	31	1	C	170S	GBF	240	30	100.07	6.05E-05	10014
15183	78542756	41601	16703	16703	5	5	31	1	C	170S	GBF	240	30	100.24	0.031605	10048.06
15684	81870438	50401	9964	9964	5	5	31	1	C	170S	GBF	240	30	100.34	0.07716	10068.12
16302	83566210	41601	58985	58985	5	5	31	1	C	170S	GBF	240	30	100.28	0.047427	10056.08
18069	93068086	50201	73150	73150	5	5	31	1	C	170S	GBF	240	30	100.56	0.247783	10112.31
18141	93068088	41001	99724	99724	5	5	31	1	C	170S	GBF	240	30	100.32	0.066449	10064.1
19001	96028198	40501	46311	46311	5	5	31	1	P	170S	GBF	240	30	100.08	0.000316	10016.01
19100	96028206	42401	69072	69072	5	5	31	1	P	1-70S	GBF	240	30	99.61	0.204505	9922.152
19863	96571882	41601	43680	43680	5	5	31	1	P	170S	GBF	240	30	99.89	0.02966	9978.012
19867	96571807	40601	4450	4450	5	5	31	1	P	170S	GBF	240	30	100.02	0.001783	10004
19871	96571880	42401	43335	43335	5	5	31	1	P	170S	GBF	240	30	100.19	0.016327	10038.04
19932	97939420	50901	63497	63497	5	5	31	1	P	170S	GBF	240	30	99.9	0.026316	9980.01
19956	97939459	42701	58372	58372	5	5	31	1	P	170S	GBF	240	30	99.67	0.153838	9934.109
20884	15462313	50301	60765	60765	5	5	31	1	P	170S	GBF	240	30	99.7	0.131205	9940.09
20950	15462348	50401	47717	47717	5	5	31	1	P	170S	GBF	240	30	99.99	0.005216	9998
21013	15442475	40301	36526	36526	5	5	31	1	P	170S	GBF	240	30	99.9	0.026316	9980.01
21022	15442504	40301	43047	43047	5	5	31	1	P	170S	GBF	240	30	99.91	0.023172	9982.008
21032	15442486	50801	5324	5324	5	5	31	1	P	METE 170S	GBF	240	30	99.25	0.659705	9850.563
21255	15449839	41201	46	46	5	5	31	1	P	170S	GBF	240	30	99.96	0.010449	9992.002
21809	17377095	51001	9436	9436	5	5	31	1	P	170S	GBF	240	30	99.98	0.00676	9996
21840	17377022	41201	413	413	5	5	31	1	P	170S	GBF	240	30	99.86	0.040894	9972.02
21883	17377048	42001	118	118	5	5	31	1	P	170S	GBF	240	30	99.81	0.063616	9962.036
21899	17377172	41101	14461	14461	5	5	31	1	P	170S	GBF	240	30	99.93	0.017483	9986.005
21962	17377126	41701	16688	16688	5	5	31	1	P	170S	GBF	240	30	100.16	0.00956	10032.03
21977	17377182	50201	8437	8437	5	5	31	1	P	170S	GBF	240	30	99.82	0.058672	9964.032
22077	17377574	41001	7879	7879	5	5	31	1	P	170S	GBF	240	30	100.17	0.01	10034.03
22138	17376913	42301	94	94	5	5	31	1	P	170S	GBF	240	30	100.04	0.000494	10008
22159	17376979	40601	5376	5376	5	5	31	1	P	170S	GBF	240	30	99.34	0.521605	9868.436
20922	15462324	42501	43331	43331	5	5	31	1	P	170S	GBF	240	30	100.07	6.05E-05	10014
22080	17376931	40901	7782	7782	5	5	31	1	C	170S	GBF	240	30	99.85	0.045038	9970.023

Year :2001 Total Meters in Group : 2436

Total Meters Tested : 54

Max Allowalbe % (Table B-3) : 5.21

Table B-5 (upper) : 0

Table B-5 (lower) : 0

5403.36 3.857133 5407.22

Standard Deviation : 0.267261

Avg: 100.062

Quality Index (upper) : 7.25051

Quality Index (lower) : 7.71614 Group #5: PASS

5145	24209289	42401	10440	10440	6	5	31	1	C	CHGI J3S	GBF	240	30	98.8	1.155482	9761.44
6475	32674785	50801	870	870	6	5	31	1	C	CHGI J3S	GBF	240	30	100.63	0.570126	10126.4
6481	32674779	40901	42062	42062	6	5	31	1	C	CHGI J3S	GBF	240	30	99.14	0.540127	9828.74
6789	33835124	40901	98593	98593	6	5	31	1	C	CHGI J3S	GBF	240	30	99.37	0.254958	9874.397
6801	33916899	40501	12437	12437	6	5	31	1	C	CHNC J3S	GBF	240	30	99.76	0.01321	9952.058
7515	37210863	41201	64026	64026	6	5	31	1	C	SEAL J4S	GBF	240	30	99.94	0.004234	9988.004
7550	37228148	50801	17694	17694	6	5	31	1	C	CHGI J4S	GBF	240	30	100.32	0.198084	10064.1
7704	37210362	40501	62150	62150	6	5	31	1	C	J4S	GBF	240	30	99.75	0.015608	9950.063
7738	37366996	41101	77401	77401	6	5	31	1	C	J4S	GBF	240	30	100.29	0.17228	10058.08
7786	37635294	51001	75368	75368	6	5	31	1	C	J4S	GBF	240	30	100.06	0.03425	10012
7823	37736363	41701	43909	43909	6	5	31	1	C	J4S	GBF	240	30	99.99	0.01324	9998
7871	37734324	42701	38252	38252	6	5	31	1	C	J4S	GBF	240	30	99.71	0.027203	9942.084
7899	37554456	42001	42181	42181	6	5	31	1	C	J4S	GBF	240	30	100.23	0.126072	10046.05
7902	37734268	50101	25469	25469	6	5	31	1	C	CHGI J4S	GBF	240	30	100.96	0.36	10192.92
8063	39347256	42501	40389	40389	6	5	31	1	C	J4S	GBF	240	30	99.83	0.002019	9966.029
8089	39514633	50801	24771	24771	6	5	31	1	C	J4S	GBF	240	30	99.86	0.000223	9972.02
8328	39825475	51001	24962	24962	6	5	31	1	C	J4S	GBF	240	30	99.87	2.43E-05	9974.017
8361	39825553	41001	57663	57663	6	5	31	1	C	J4S	GBF	240	30	100.12	0.060058	10024.01
8379	39825545	40501	54042	54042	6	5	31	1	C	J4S	GBF	240	30	100.22	0.119071	10044.05
8384	39825578	50801	87046	87046	6	5	31	1	C	J4S	GBF	240	30	99.73	0.021006	9946.073
8403	39825593	41201	74207	74207	6	5	31	1	C	J4S	GBF	240	30	100.21	0.11227	10042.04
8420	39825613	42001	71285	71285	6	5	31	1	C	J4S	GBF	240	30	99.85	0.000622	9970.023
8611	40069919	42001	2470	2470	6	5	31	1	C	J4S	GBF	240	30	99.86	0.000223	9972.02
8701	40113474	40301	98105	98105	6	5	31	1	C	J4S	GBF	240	30	99.94	0.004234	9988.004
8728	40113446	51001	3341	3341	6	5	31	1	C	J4S	GBF	240	30	99.72	0.024004	9944.078
8813	40069781	42301	64616	64616	6	5	31	1	C	J4S	GBF	240	30	99.35	0.275555	9870.423
9002	40112995	50301	81781	81781	6	5	31	1	C	J4S	GBF	240	30	100.16	0.081263	10032.03
9180	40116922	40501	62997	62997	6	5	31	1	C	J4S	GBF	240	30	99.87	2.43E-05	9974.017
9227	40113853	41901	2551	2551	6	5	31	1	C	J4S	GBF	240	30	100.14	0.07026	10028.02
9234	40113919	41901	16211	16211	6	5	31	1	C	J4S	GBF	240	30	100.05	0.030648	10010
9307	40211431	41701	19732	19732	6	5	31	1	C	J4S	GBF	240	30	99.93	0.003032	9986.005
9428	41464259	50401	35306	35306	6	5	31	1	C	J4S	GBF	240	30	99.78	0.009012	9956.048
9433	41801120	41001	1623	1623	6	5	31	1	C	J4S	GBF	240	30	100	0.015642	10000
9523	41801241	40601	41569	41569	6	5	31	1	C	J4S	GBF	240	30	100.13	0.065059	10026.02
9567	44784809	50201	12205	12205	6	5	31	1	C	J4S	GBF	240	30	99.19	0.469134	9838.656
9723	45056951	41701	89094	89094	6	5	31	1	C	J4S	GBF	240	30	100.18	0.093066	10036.03
9895	45280770	50301	7477	7477	6	5	31	1	C	J4S	GBF	240	30	99.67	0.041998	9934.109
9900	45280749	50801	86204	86204	6	5	31	1	C	J4S	GBF	240	30	99.39	0.23516	9878.372
9958	45499169	41601	69815	69815	6	5	31	1	C	J4S	GBF	240	30	99.9	0.000628	9980.01
9971	45498831	41201	49503	49503	6	5	31	1	C	J4S	GBF	240	30	99.27	0.365944	9854.533
10064	45789395	42001	91223	91223	6	5	31	1	C	J4S	GBF	240	30	100.25	0.140675	10050.06
10132	45852019	41001	39536	39536	6	5	31	1	C	J4S	GBF	240	30	100.04	0.027247	10008
10170	46554808	50901	65903	65903	6	5	31	1	C	J4S	GBF	240	30	99.42	0.206964	9884.336
10235	46554755	41701	79729	79729	6	5	31	1	C	J4S	GBF	240	30	99.9	0.000628	9980.01
10365	46739251	50301	93323	93323	6	5	31	1	C	J4S	GBF	240	30	99.21	0.442136	9842.624
10786	47072931	42501	74621	74621	6	5	31	1	C	J4S	GBF	240	30	99.78	0.009012	9956.048
11188	48331615	50201	7922	7922	6	5	31	1	C	J4S	GBF	240	30	100.09	0.046254	10018.01
11626	48343973	50401	23174	23174	6	5	31	1	P	DEM J4EDS	GBF	240	30	101.07	1.428184	10215.14
11828	49927641	50401	62150	62150	6	5	31	1	C	J4S	GBF	240	30	99.49	0.148174	9898.26
11842	49927163	41601	57702	57702	6	5	31	1	C	J4S	GBF	240	30	99.56	0.10	9912.194
11850	49926917	41001	4536	4536	6	5	31	1	C	J4S	GBF	240	30	100.2	0.105668	10040.04
11883	49926993	41601	43257	43257	6	5	31	1	C	J4S	GBF	240	30	99.58	0.086986	9916.176
12017	50261921	41901	10130	10130	6	5	31	1	C	J4S	GBF	240	30	100.11	0.055256	10022.01
12081	50261825	42501	97293	97293	6	5	31	1	C	J4S	GBF	240	30	100.41	0.286296	10082.17
12235	54199933	42501	84214	84214	6	5	31	1	C	J4S	GBF	240	30	99.5	0.140575	9900.25
12305	54199981	50801	68269	68269	6	5	31	1	C	J4S	GBF	240	30	100.36	0.23529	10072.13
12386	54331643	41901	87895	87895	6	5	31	1	C	J4S	GBF	240	30	99.1	0.600522	9820.81
12398	54332787	40601	54790	54790	6	5	31	1	C	J4S	GBF	240	30	100	0.015642	10000
12411	54332799	50201	76034	76034	6	5	31	1	C	J4S	GBF	240	30	99.94	0.004234	9988.004

12437	51741035	50901	27952	27952	6	5	31	1	C	J4S	GBF	240	30	99.91	0.00123	9982.008
12438	51741036	50301	92701	92701	6	5	31	1	C	J4S	GBF	240	30	99.1	0.600522	9820.81
12463	51741030	42301	60409	60409	6	5	31	1	C	CUT-J4S	GBF	240	30	100.73	0.731139	10146.53
12584	51741443	40301	23601	23601	6	5	31	1	C	J4S	GBF	240	30	99.9	0.000628	9980.01
12701	55544347	41001	65672	65672	6	5	31	1	C	J4S	GBF	240	30	99.49	0.148174	9898.26
12705	55544340	42401	4987	4987	6	5	31	1	C	J4S	GBF	240	30	99.5	0.140575	9900.25
12730	51741509	41101	69885	69885	6	5	31	1	C	J4S	GBF	240	30	99.75	0.015608	9950.063
13327	57685444	41901	13300	13300	6	5	31	1	C	CHGI J4S	GBF	240	30	99.46	0.17217	9892.292
13480	57390683	41601	13751	13751	6	5	31	1	C	J4S	GBF	240	30	99.95	0.005635	9990.003
13496	57430139	40301	8641	8641	6	5	31	1	C	J4S	GBF	240	30	100.07	0.038051	10014
13529	57480330	40301	67697	67697	6	5	31	1	C	J4S	GBF	240	30	99.19	0.469134	9838.656
13931	60974393	41801	22920	22920	6	5	31	1	C	J4S	GBF	240	30	99.91	0.00123	9982.008
13975	60974527	42701	1165	1165	6	5	31	1	C	J4S	GBF	240	30	99.98	0.011039	9996
14040	60974466	50101	23645	23645	6	5	31	1	C	J4S	GBF	240	30	100.13	0.065059	10026.02
14498	66146153	50101	96964	96964	6	5	31	1	C	J4S	GBF	240	30	100.12	0.060058	10024.01
14531	66146236	40501	34415	34415	6	5	31	1	C	J4S	GBF	240	30	100.25	0.140675	10050.06

Year :2001 Total Meters in Group : 3356

Total Meters Tested : 75

Max Allowalbe % (Table B-3) : 4.83

Table B-5 (upper) : 0

Table B-5 (lower) : 0

7490.62 12.2649 748138.3

Standard Deviation : 0.404391

Avg: 99.8749

Quality Index (upper) : 5.25498

Quality Index (lower) : 4.63644 Group #6: PASS

14681	69974550	41801	1113	1113	7	5	31	1	C	J5S	GBF	240	30	100.2	0.084423	10040.04
14733	69963219	41601	80437	80437	7	5	31	1	C	J5S	GBF	240	30	100.03	0.014534	10006
14848	69963962	40901	69268	69268	7	5	31	1	C	SER J5S	GBF	240	30	100.05	0.019756	10010
15326	74932820	50801	64263	64263	7	5	31	1	C	J5S	GBF	240	30	99.88	0.000867	9976.014
15498	74933025	42701	90458	90458	7	5	31	1	C	J5S	GBF	240	30	100.78	0.757867	10156.61
15535	77669719	41101	15033	15033	7	5	31	1	C	J5S	GBF	240	30	100.01	0.010111	10002
15538	77669718	41801	46102	46102	7	5	31	1	C	CHC J5S	GBF	240	30	99.95	0.001645	9990.003
15581	77669750	42301	68924	68924	7	5	31	1	C	J5S	GBF	240	30	100.05	0.019756	10010
15593	77669752	40301	40055	40055	7	5	31	1	C	J5S	GBF	240	30	99.88	0.000867	9976.014
15815	77922098	50801	83879	83879	7	5	31	1	C	J5S	GBF	240	30	100.09	0.0326	10018.01
15853	77787688	40301	11978	11978	7	5	31	1	C	J5S	GBF	240	30	100.15	0.057867	10030.02
15881	77787680	40601	99622	99622	7	5	31	1	C	J5S	GBF	240	30	99.67	0.057334	9934.109
16051	79528502	50101	68950	68950	7	5	31	1	C	J5S	GBF	240	30	100.04	0.017045	10008
16087	79528551	42701	22031	22031	7	5	31	1	C	J5S	GBF	240	30	100.18	0.0732	10036.03
16139	79670307	50901	57583	57583	7	5	31	1	C	J5S	GBF	240	30	100.05	0.019756	10010
16166	79670378	50801	13234	13234	7	5	31	1	C	J5S	GBF	240	30	99.9	8.92E-05	9980.01
16204	79670403	41001	35334	35334	7	5	31	1	C	J5S	GBF	240	30	100.24	0.109267	10048.06
16216	79670377	50201	75382	75382	7	5	31	1	C	J5S	GBF	240	30	99.76	0.022334	9952.058
16970	83562553	42601	29984	29984	7	5	31	1	C	J5S	GBF	240	30	99.94	0.000934	9988.004
17003	83495054	40601	51871	51871	7	5	31	1	C	J5S	GBF	240	30	100.06	0.022667	10012
17050	83562624	41801	51955	51955	7	5	31	1	C	J5S	GBF	240	30	100.26	0.122889	10052.07
17058	83562590	40301	37895	37895	7	5	31	1	C	J5S	GBF	240	30	100.59	0.463156	10118.35
17069	83562619	50201	17952	17952	7	5	31	1	C	J5S	GBF	240	30	99.84	0.004823	9968.026
17079	83562588	50401	6334	6334	7	5	31	1	C	J5S	GBF	240	30	99.72	0.035889	9944.078
17209	87935833	50401	32300	32300	7	5	31	1	C	J5S	GBF	240	30	100.27	0.13	10054.07
17220	87952408	42401	57715	57715	7	5	31	1	C	J5S	GBF	240	30	100.39	0.230934	10078.15
17279	87952420	40601	46009	46009	7	5	31	1	C	J5S	GBF	240	30	99.67	0.057334	9934.109
17300	87547073	41801	98216	98216	7	5	31	1	C	J5S	GBF	240	30	99.87	0.001556	9974.017
17308	87547025	41901	22592	22592	7	5	31	1	C	J5S	GBF	240	30	100.39	0.230934	10078.15
17312	87547026	41801	53468	53468	7	5	31	1	C	J5S	GBF	240	30	100.01	0.010111	10002
18267	95601694	42601	5523	5523	7	5	31	1	P	J5S	GBF	240	30	99.64	0.0726	9928.13
18323	95601683	41001	68728	68728	7	5	31	1	P	J5S	GBF	240	30	99.73	0.0322	9946.073
18393	95601793	42601	90552	90552	7	5	31	1	P	J5S	GBF	240	30	100.32	0.168556	10064.1
18437	95601658	41601	28464	28464	7	5	31	1	P	J5S	GBF	240	30	100.05	0.019756	10010
19727	11790072	50901	4856	4856	7	5	31	1	P	J5S	GBF	240	30	99.57	0.115223	9914.185
19766	11790090	41601	67077	67077	7	5	31	1	P	J5S	GBF	240	30	100.11	0.040223	10022.01
20104	11793804	41801	55548	55548	7	5	31	1	P	ETS J5S	GBF	240	30	99.41	0.249445	9882.348
20161	12328084	50901	16870	16870	7	5	31	1	P	J5S	GBF	240	30	99.98	0.004978	9996
20169	12327999	50101	34754	34754	7	5	31	1	P	J5S	GBF	240	30	99.84	0.004823	9968.026
20173	12328080	41801	153	153	7	5	31	1	P	CHG J5S	GBF	240	30	98.02	3.57	9607.92
20220	12697621	40501	60540	60540	7	5	31	1	P	J5S	GBF	240	30	99.74	0.028711	9948.068
20226	12697685	50301	17758	17758	7	5	31	1	P	J5S	GBF	240	30	100.11	0.040223	10022.01
20244	12697710	42301	48513	48513	7	5	31	1	P	J5S	GBF	240	30	99.55	0.1292	9910.203
20273	12697683	40301	35791	35791	7	5	31	1	P	J5S	GBF	240	30	99.61	0.089667	9922.152
20423	12697491	40301	41382	41382	7	5	31	1	P	J5S	GBF	240	30	99.38	0.280311	9876.384
20478	12697504	42401	59471	59471	7	5	31	1	P	J5S	GBF	240	30	99.87	0.001556	9974.017
20546	13639852	51001	45864	45864	7	5	31	1	P	J5S	GBF	240	30	99.72	0.035889	9944.078
20559	13639916	50301	4578	4578	7	5	31	1	P	MET J5S	GBF	240	30	100.12	0.044334	10024.01
20610	14239611	40601	33913	33913	7	5	31	1	P	J5S	GBF	240	30	100.05	0.019756	10010
21641	19069153	41701	15230	15230	7	5	31	1	P	J5S	GBF	240	30	99.31	0.36	9862.476
21693	19069068	42001	2652	2652	7	5	31	1	P	J5S	GBF	240	30	99.9	8.92E-05	9980.01
21704	19069084	50201	13490	13490	7	5	31	1	P	J5S	GBF	240	30	99.94	0.000934	9988.004
21729	17785504	42401	4785	4785	7	5	31	1	P	J5S	GBF	240	30	99.54	0.136489	9908.212
21779	19069106	42301	29255	29255	7	5	31	1	P	J5S	GBF	240	30	99.68	0.052645	9936.102

Year :2001 Total Meters in Group : 2818

Total Meters Tested : 54

Max Allowalbe % (Table B-3) : 5.21

Table B-5 (upper) : 0

Table B-5 (lower) : 0

Standard Deviation : 0.387477

Avg: 99.909444

Quality Index (upper) : 5.3952995

Quality Index (lower) : 4.9278885 Group #7: PASS

LG&ENERGY

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NOV 0 1 2001

PUBLIC SERVICE
COMMISSION

LG&E Energy Corp.
220 West Main Street
PO Box 32010
Louisville, Kentucky 40232

October 31, 2001

RECEIVED

NOV 01 2001

DIVISION OF UTILITY
ENGINEERING & SERVICES

Mr. Robert Amato
Director – Division of Engineering
Kentucky Public Service Commission
211 Sower Boulevard
Frankfort, Kentucky 40601


Dear Mr. Amato:

The PSC Order in Case Number 1999-441 allowed for a new sample-testing plan for participating electric utilities. This order required these same utilities to submit an annual report to the Commission.

KU and LG&E sample test periods will run from January 1 – December 31 for each of the five (5) test years, followed by the year-end summary report which will be filed on March 1 of each concurrent year.

If you have any questions please do not hesitate to contact me.

Sincerely,



Marty J. Reinert
Regulatory Analyst II

KU

A SUBSIDIARY OF
LG&ENERGY

HISTORY INDEX FOR CASE: 1999-441
INTER-COUNTY ENERGY COOPERATIVE CORPORATION
Deviation

AEP, KU, LG&E, OWEN, SHELBY, ULH&P-METER TESTING PLAN

IN THE MATTER OF THE JOINT APPLICATION OF THE UTILITIES:
INTER COUNTY ENERGY COOPERATIVE CORP., KENTUCKY POWER
COMPANY, d/b/a AMERICAN ELECTRIC POWER, KENTUCKY UTILITIES
COMPANY, LOUISVILLE GAS AND ELECTRIC, OWEN ELECTRIC
COOPERATIVE, SHELBY ENERGY COOPERATIVE, THE UNION LIGHT,
HEAT AND POWER COMPANY COLLECTIVELY CALLED ("UTILITIES")
FOR APPROVAL OF A PILOT METER TESTING PLAN PURSUANT TO 807
KAR 5:041, SECTIONS 13, 15, 16, 17 AND 22

SEQ NBR	ENTRY DATE	REMARKS
0001	10/29/1999	Application.
0002	11/02/1999	Acknowledgement letter.
0003	12/29/1999	Data Request Order, responses from utilities due 1/21/2000.
M0001	01/21/2000	MARK OVERSTREET JOINT UTILITIES-RESPONSE TO ORDER OF DEC 29,99
0004	02/23/2000	Order sched. IC on 3/8 to discuss the utilities' responses to 12/29 Order.
0005	03/21/2000	IC Memo; comments, if any, due in 5 days.
M0002	04/17/2000	MARK OVERSTREET KY POWER-PETITION FOR CONFIDENTIAL TREATMENT
M0003	04/17/2000	MARK OVERSTREET KY POWER-RESPONSE TO DATA REQ BY PSC STAFF ON MARCH 8,00
M0004	04/17/2000	MARK OVERSTREET KY POWER-MOTION FOR LEAVE TO FILE AMENDED JOINT APPLICATION
0006	04/26/2000	Letter granting petition for conf. filed 4/17/2000 by LG&E et.al.
0007	05/05/2000	Order ent., case s/be submitted for decision unless req. for hearing filed by 5/15
M0007	05/11/2000	MARK R. OVERSTREET-SUPPLEMENTATION OF DATA RESPONSE & NOTICE OF WAIVER OF HEARING
0008	08/04/2000	Final Order giving the Utilities 20 days to file meter test plan.
M0005	08/24/2000	MARK OVERSTREET-RESPONSE TO ORDER OF AUG 4,00 REVISED AMENDED SAMPLE METER PLAN
0009	10/09/2000	Order ent., the utilities shall file w/in 20 days a corrected Rev. Amended Plan.
M0006	10/25/2000	MARK OVERSTREET/ULH&P-RESPONSE TO COMMISSION'S ORDER OF OCTOBER 9, 2000
0010	12/12/2000	Final Order accepting filing and closing case.




COMMONWEALTH OF KENTUCKY
PUBLIC SERVICE COMMISSION
211 SOWER BOULEVARD
POST OFFICE BOX 615
FRANKFORT, KY. 40602
(502) 564-3940

CERTIFICATE OF SERVICE

RE: Case No. 1999-441
INTER-COUNTY ENERGY COOPERATIVE CORPORATION

I, Stephanie Bell, Secretary of the Public Service Commission, hereby certify that the enclosed attested copy of the Commission's Order in the above case was served upon the following by U.S. Mail on December 12, 2000.

See attached parties of record.


Secretary of the Commission

SB/hv
Enclosure

James L. Jacobus
President/CEO
Inter-County Energy Cooperative
Corporation
1009 Hustonville Road
P. O. Box 87
Danville, KY. 40423 0087

Honorable William M. Dishman
Counsel for Inter County Energy
Silliman, Dishman & Nickels
P.O. Box 850
Danville, KY. 40423 0850

Errol K. Wagner
Director of Regulatory Affairs
American Electric Power
1701 Central Avenue
P. O. Box 1428
Ashland, KY. 41105 1428

Honorable Douglas M. Brooks
Senior Counsel Specialist, Reg.
Louisville Gas and Electric
Kentucky Utilities Company
220 West Main Street
Louisville, KY. 40202

Ronald Willhite
Vice President Regulatory Affairs
Louisville Gas and Electric Company
220 W. Main Street
P. O. Box 32010
Louisville, KY. 40232 2010

Honorable James M. Crawford
Counsel for Owen Electric
Crawford & Baxter, P.S.C.
Attorneys at Law
523 Highland Avenue
P.O. Box 353
Carrollton, KY. 41008

Frank Downing
Manager
Owen Electric Cooperative, Inc.
510 South Main Street
P. O. Box 400
Owenton, KY. 40359

Honorable Donald T. Prather
Counsel for Shelby Energy
Mathis, Riggs & Prather, P.S.C.
Attorneys at Law
500 Main Street
P.O. Box 1059
Shelbyville, KY. 40065

Dudley Bottom
General Manager
Shelby Energy Cooperative, Inc.
620 Old Finchville Road
Shelbyville, KY. 40065

Honorable John J. Finnigan
Senior Counsel
The Union Light, Heat & Power Co.
139 E. Fourth Street
25th Fl. Atrium II
Cincinnati, OH. 45202

James B. Gainer
Legal Division
The Union Light Heat & Power Co
139 E. Fourth Street
Cincinnati, OH. 45202

Honorable Mark R. Overstreet
Counsel for American Electric Power
Stites & Harbison
421 West Main Street
Post Office Box 634
Frankfort, KY. 40602 0634

COMMONWEALTH OF KENTUCKY
BEFORE THE PUBLIC SERVICE COMMISSION

In the Matter of:

THE JOINT APPLICATION OF KENTUCKY UTILITIES;)
INTER COUNTY ENERGY COOPERATIVE)
CORPORATION; KENTUCKY POWER COMPANY D/B/A)
AMERICAN ELECTRIC POWER; KENTUCKY UTILITIES)
COMPANY; LOUISVILLE GAS AND ELECTRIC COMPANY;))
OWEN ELECTRIC COOPERATIVE; SHELBY ENERGY)
COOPERATIVE; THE UNION LIGHT, HEAT AND POWER)
COMPANY (COLLECTIVELY CALLED "UTILITIES") FOR)
APPROVAL OF A PILOT METER TESTING PLAN)
PURSUANT TO 807 KAR 5:041, SECTIONS 13, 15, 16,)
17, AND 22)

CASE NO.
99-441

O R D E R

The Commission, having reviewed the Revised Amended Sample Meter Test Plan filed on October 25, 2000 by the seven electric utility applicants in this case, and finding that the filing cures the deficiencies noted in our October 9, 2000 Order, HEREBY ORDERS that the filing is accepted and this case is closed.

Done at Frankfort, Kentucky, this 12th day of December, 2000.

By the Commission

ATTEST:


Executive Director

STITES & HARBISON

ATTORNEYS

October 25, 2000

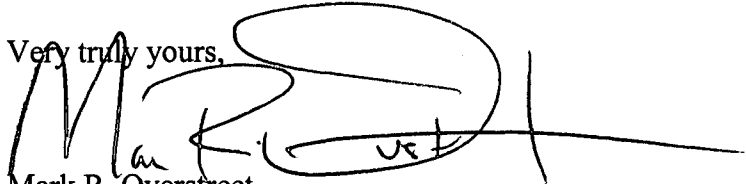
Thomas M. Dorman
Executive Director
Public Service Commission of Kentucky
211 Sower Boulevard
P.O. Box 615
Frankfort, Kentucky 40602-0615

RE: Case No. 1999-441

Dear Mr. Dorman:

Pursuant to the Commission's Order dated October 9, 2000 in the above matter, please find enclosed the Applicants' Revised Amended Sample Meter Pilot Testing Plan. If you have any questions, please do not hesitate to contact me.

Very truly yours,


Mark R. Overstreet

Enclosures

KE057:KE140:4792:FRANKFORT

421 West Main Street
Post Office Box 634
Frankfort, KY 40602-0634
[502] 223-3477
[502] 223-4124 Fax
www.stites.com

Mark R. Overstreet
[502] 209-1219
moverstreet@stites.com

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OCT 25 2000

PUBLIC SERVICE
COMMISSION

APPENDIX A

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OCT 25 2000

PUBLIC SERVICE
COMMISSION

**REVISED AMENDED SAMPLE METER
TESTING PILOT PLAN**

REVISED AMENDED SAMPLE METER TESTING PILOT PLAN

I. New Metering Device Tests

1. New metering devices shall be either 100% tested by the utility or 100% tested by the manufacturer.
2. New meters tested by the manufacturer should be sample tested by the utility prior to being placed in service.
3. Utilities must obtain a watt-hour reference standard from each meter manufacturer that supplies them with meters and perform the required testing of those meters and send it to the Commission's Meter Standards Laboratory for testing annually.
4. Utilities must provide certified test results of all new meters received to the Commission's Meter Testing Laboratory annually.
5. National Institute of Standards and Technology comparison test results should also be provided from all of the manufacturers that are performing 100 percent testing as well as traceability charts.

II. Standards for In-Service Performance - Watthour Meters and Electronic Registers

A. Purpose

1. This section shall establish accuracy limits, test plans and inspection procedures for alternating-current revenue watthour meters.
2. Watthour meters placed into service or returned to service shall meet the provisions set forth in this Section test plan.
3. All watthour meters and their associated equipment shall be thoroughly inspected at the time of installation to assure safe and accurate operation.

B. Accuracy Requirements

1. Testing Equipment and Standards

b. All working electronic watt-hour standards when regularly used shall be compared with a master standard every six months. Working watt-hour standards infrequently used shall be compared with a master standard before they are used.

b. All working indicating instruments that affect the customer's quality of service shall be checked against master indicating instruments annually. If the working instrument is found appreciably in error at zero or in error by more than one (1) percent of indication at commonly used scale deflections, it shall be adjusted. A calibration record shall be maintained for each instrument showing all pertinent data and name of person performing tests.

2. Test Loads

Full load shall be approximately 100% of test amperes at unity power factor, light load approximately 10% of test amperes at unity power factor and power factor 100% test amperes 50% lagging power factor. For meters used with current transformers, full load shall be approximately 100% of either meter test amperes or the secondary current rating of the current transformers; light load shall be approximately 10% of the selected full load current.

3. Acceptable Performance

The performance of all in-service watthour meters is considered to be acceptable when the percent registration is not less than 98% or more than 102% as determined in paragraph D(5) of this section.

4. Adjustment Limits

Watthour meters shall be adjusted when the error in registration exceeds 1% at either light load or full load or when the error in registrations exceeds 2% at power factor. The registration of the watthour meter shall be adjusted within these limits as close to 100% as practical.

5. Acceptable Performance for Electronic Registers

The performance of a watthour meter with an electronic register when tested for other than kilowatthour registration shall be acceptable when the error measured does not exceed $\pm 2\%$ of reading.

C. Tests

1. As-found Tests

As-found tests are done to determine the watthour meter accuracy before recalibration.

2. As-left Tests

As-left tests shall be conducted after all adjustments are completed and are in accordance with paragraph B(3) in this section.

D. Performance Tests

1. General

The performance of watthour meters should be verified by an annual test program such as one of the plans listed below. Records shall be maintained on each watthour meter tested. Subsequently, an analysis of the test results for each group of watthour meters shall be made and appropriate action shall be taken. The plans for testing are:

- a. Periodic Interval Plan
- b. Statistical Sampling Plan

2. Objectives

The primary purpose of performance testing is to provide information on which the utility may base a program to maintain meters in an acceptable degree of accuracy throughout their service life.

3. Test Plans

The Periodic Interval Plan is a schedule of testing for watthour meters at various set intervals. The Statistical Sampling Plan provides for the division of watthour meters into homogeneous groups. The annual selection process is random where each watthour meter within each group has an equal chance of being selected.

a. Periodic Interval Plan

The selected periodic interval for testing a watthour meter depends on the size of the service, complexity of the metering system, reliability of the type of watthour meter and/or manufacturer's

recommendations. The plan listed below is a detailed periodic testing schedule by wathour meter and attachments:

Periodic Testing Schedule

Years Between Testing

(1)	Graphic Watthour Demand	2
(2)	Electromechanical Watthour Meters without surge-proof magnets	8
(3)	Thermal Lagged Demand Meters	16
(4)	Magnetic Tape Demand Records	12
(5)	Electromechanical Watthour Meters with surge-proof magnets and:	
(a)	Mech KWH Register	16
(b)	Mech Demand Registers	10
(c)	Electronic Demand Register	16
(d)	Mech Cam Pulse Initiator	2
(e)	Mech Gear Shutter Pulse Initiator	8
(f)	Electronic Pulse Initiator	12
(g)	Electronic Remote Registers	8
(h)	Electronic TOU Register	16
(6)	Electronic Meter	16
For single phase and polyphase transformer rated meters:		
(7)	Electronic Meters	
(a)	Billing Constant 500 or less	12
(b)	Billing Constant 500 - 10,000	8
(c)	Billing Constant >10,000	4
(8)	Electromechanical Watthour Meters with surge proof magnets	
(a)	Billing Constant 500 or less	8
(b)	Billing Constant >500	4

Test interval is based on the Billing Constant which equals the absolute CT ratio X VT ratio. (i.e. With a 40:1 CT and a 60:1 VT ratio, the Billing Constant is 2400)

b. Statistical Sampling Plan

The Statistical Sampling Plan used shall conform to accepted principles of statistical sampling based on either variables or attributes methods. Meters shall be divided into homogeneous groups, or lots. Meter lot composition will be based on manufacturer and model, assuming like design and construction, with individual lot population not to exceed 15,000 meters. For meter model populations of like design exceeding 15,000 units, multiple lots must be established, with meter age determining lot composition. For example, the first 15,000 meters purchased will comprise Lot #1, the second 15,000 meters purchased will comprise Lot #2, etc. This process will continue until the meter model population is exhausted. Utilities will have the option of using a smaller lot composition, as shown below:

Lot	Meter Type	Meter Population
1	J4S	7,882
2	I70S	10,000
3	I70S	9,130
4	D5S	4,535
5	MS	6,892
6	J5S	9,922
7	MX	8,325

The number of meters to be selected in a Sample Test Plan shall be based on the American National Standard ANSI/ASQC Z1.9-1993.

The performance of the meters will also be based on criteria within this standard.

The minimum quantity of meters pulled shall be based on Inspection Level II, AQL = 2.5, Table A-2 (see Attachment No. 1) and Table B-3 (see Attachment No. 2).

Lot performance shall be deemed acceptable if the full load performance of the meters within the lot meet the acceptability criteria of the ANSI/ASQC Z1.9-1993 based on an upper limit of 102% and a lower limit of 98% using Table B-3 (see Attachment No. 2).

The utility must replace or test all meters in a failed test group within 18 months of the annual report to the Commission. If this requirement should pose an operational hardship on a utility, then the utility should file a request for deviation.

4. Test Records

The data to be recorded for the sample test plan shall include:

- (a) the number of meters in each group at the beginning of the test year
- (b) the number of meters tested
- (c) the analyzed test results

5. Determination of Billing Accuracy

The percentage registration of a watthour meter is, in general, different at light loads than at full loads, and may have still other values at other loads.

The determination of the average percentage registration of a watthour

meter is not a simple matter, since it involves the characteristics of the meter and the loading. The accuracy of meters is more closely associated with the FL test accuracy for most loads since the LL accuracy is only representative of the meter's performance at a very small load conditions.

Average percentage registration is the weighted average of the percentage registration at light load (LL) and at full load (FL), giving the full load registration a weight of four:

$$\text{Weighted Percentage Registration} = \frac{4\text{FL} + \text{LL}}{5}$$

III. Mechanical and Thermal Demand Registers and Pulse Recorders

A. Accuracy Requirements

1. Acceptable Performance

The performance of a mechanical or lagged demand register shall be acceptable when the error in demand registration does not exceed ± 4 percent in terms of full-scale value when tested at any point between 50% and 100% of full-scale.

Under usual operating conditions, the performance of a pulse recording device shall be acceptable when the kilowatthours calculated from the pulse count do not differ by more than 2% from the corresponding kilowatthour meter registration.

2. Test Points

Mechanical or lagged demand registers should be tested at load Points or at above 50% of full scale.

3. Adjustment Limits

When a test of a mechanical or lagged demand register indicates that the error in registration exceeds that specified in paragraph A(1) in this section, the demand register shall be adjusted to within $\pm 2\%$ of full-scale value.

B. Instrument Transformers (Magnetic)

1. Pre-installation Tests

Prior to installation, all new instrument transformers shall be tested for voltage withstand, ratio correction factor, and phase angle. The tests shall be performed in accordance with the criteria established in IEEE C57.13.

2. Instrument Transformers Removed from Service

Instrument transformers removed from service will continue to be tested before retirement or return to service.

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

TABLE A-2²
Sample Size Code Letters¹

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	

¹Sample size code letters given in body of table are applicable when the indicated inspection levels are to be used.

²The 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.

APPENDIX B

INTER COUNTY ENERGY COOPERATIVE

Inter County Energy Figure 1

GROUP	MANUFACTURER	TYPE	TOTAL	SAMPLE SIZE
1	General Electric	I60	1,070	35
2	General Electric	I70	1,899	50
3	General Electric	I55, I55S, I50, I50S	368	20
4	Sangamo	J3S	856	35
5	Sangamo	J4S	5,027	75
6	Sangamo	J5S	6,886	75
7	Westinghouse	D4S	1,902	50
8	Westinghouse	D5S	1,015	35
9	ABB	AB1	1,345	50
10	Duncan	MX	192	15
		TOTAL	20,560	440

NOTES

- 1) The chart above is based on 1997 data used in the initial application to PSC
- 2) The total number of meters on the system include those meters in transition to and from the meter test shop

APPENDIX C

**KENTUCKY POWER COMPANY
D/B/A
AMERICAN ELECTRIC POWER**

Kentucky Power's Sample Test Groups Numbers of Meters per group will vary slight as our installed base changes

Group Name	Meter Types (approximate)	Installed Meters	Sample Qnty.	Comments
I70S1	I70S Series	10,000	75	74,000 Total I70S series currently
I70S2	Oldest	10,000	75	
I70S3	to	10,000	75	
I70S4	Newest	10,000	75	
I70S5		10,000	75	
I70S6		10,000	75	
I70S7		13,700	100	Newest
MS1	MS Series	10,000	75	31,300 Total MS series currently
MS2	Oldest to	10,000	75	
MS3	Newest	11,400	100	
J5S	J5S Series	14,500	100	
J4S1	J4S Oldest	5,700	75	
J4S	J4S	10,000	75	
D4S1	D4S Oldest	5,000	75	
D4S2	D4S Newest	10,000	75	
D5S1	D5S	4,000	75	Less than 77.5M
D5S2	D5S	1,250	50	Greater than 77.5M (known mfrg. change s/n)
I60S	I60S series	2,420	50	
I55S	I55S series	1,438	50	
I50S	I50S series	588	35	
J3S	J3S Series	962	35	
MQS	MQS	267	15	
MX	MX series	2,789	50	
Total			1560	

kentuckysample92000

APPENDIX D

KENTUCKY UTILITIES COMPANY

Sample Test Groups for Kentucky Utilities Company

Group Name	Meter Type	In Service Population	Sample Quantity
I50	GE I50	4,228	75
I55	GE I55	3,963	75
I60-1	GE I60	10,000	75
I60-2	GE I60	10,000	75
I60-3	GE I60	10,000	75
I60-4	GE I60	10,000	75
I60-5	GE I60	1,476	50
I70-1	GE I70	10,000	75
I70-2	GE I70	10,000	75
I70-3	GE I70	10,000	75
I70-5	GE I70	10,000	75
I70-6	GE I70	10,000	75
I70-7	GE I70	10,000	75
I70-8	GE I70	10,000	75
I70-9	GE I70	10,000	75
I70-10	GE I70	10,000	75
I70-11	GE I70	10,000	75
I70-12	GE I70	10,000	75
I70-13	GE I70	10,000	75
I70-14	GE I70	10,000	75
I70-15	GE I70	1,350	50
V612	GE V612	887	35
V62	GE V62	383	20
DS	Westinghouse DS	712	35
D2	Westinghouse D2	1,041	35
D3	Westinghouse D3	3,654	75
D4-1	Westinghouse D4	10,000	75
D4-2	Westinghouse D4	10,000	75
D4-3	Westinghouse D4	10,000	75
D4-4	Westinghouse D4	10,000	75
D4-5	Westinghouse D4	3,279	75
D5	Westinghouse D5	4,515	75
TD	Westinghouse TD	1,218	50
AB1-1	ABB AB1	10,000	75
AB1-2	ABB AB1	3,450	75
JM	Sangamo JM	1,259	50
J2	Sangamo J2	2,188	50
J3-1	Sangamo J3	10,000	75
J3-2	Sangamo J3	5,399	75

J4-1	Sangamo J4	10,000	75
J4-2	Sangamo J4	10,000	75
J4-3	Sangamo J4	10,171	100
J5-1	Schlumberger J5	10,000	75
J5-2	Schlumberger J5	10,000	75
J5-3	Schlumberger J5	10,000	75
J5-4	Schlumberger J5	10,000	75
J5-5	Schlumberger J5	10,000	75
J5-6	Schlumberger J5	10,000	75
J5-7	Schlumberger J5	10,000	75
J5-8	Schlumberger J5	10,000	75
J5-9	Schlumberger J5	10,000	75
J5-10	Schlumberger J5	4,020	75
S12S	Schlumberger S12	96	10
MF	Duncan MF	1,398	50
MK	Duncan MK	1,513	50
MQS	Duncan MQS	7,052	75
MS-1	Duncan MS	10,000	75
MS-2	Duncan MS	10,000	75
MS-3	Duncan MS	10,000	75
MS-4	Duncan MS	10,000	75
MS-5	Duncan MS	8,791	75
MSII	Landis & Gyr MSII	5,077	75
MX-1	Landis & Gyr MX	10,000	75
MX-2	Landis & Gyr MX	2,712	50
DXMS	Landis & Gyr DXMS	258	15
DXMX	Landis & Gyr DXMX	137	10

APPENDIX E

LOUISVILLE GAS & ELECTRIC COMPANY

Sample Test Groups for Louisville Gas and Electric Company

Group Name	Meter Type	In-service Population	Sample Quantity
I50	GE I50	2,859	50
I55	GE I55	3,000	50
DS	Westinghouse DS	1,337	50
J2	Sangamo J2	1,881	50
I60-2	GE I60	10,000	75
I60-2	GE I60	7,877	75
D2S	Westinghouse D2S	2,367	50
J3	Sangamo J3	6,624	75
MQS	Duncan MQS	1,024	35
D4-1	Westinghouse D4	10,000	75
D4-2	Westinghouse D4	9,373	75
J4-1	Sangamo J4	10,000	75
J4-2	Sangamo J4	3,852	75
MS	Duncan MS	9,849	75
I70-1	GE I70	10,000	75
I70-2	GE I70	10,000	75
I70-3	GE I70	10,000	75
I70-4	GE I70	10,000	75
I70-5	GE I70	10,000	75
I70-6	GE I70	10,000	75
I70-7	GE I70	10,000	75
I70-8	GE I70	10,000	75
I70-9	GE I70	10,000	75

I70-10	GE I70	10,000	75
I70-11	GE I70	2,326	50
D5	Westinghouse D5	7,084	75
MSII-1	Landis & Gyr MSII	10,000	75
MSII-2	Landis & Gyr MSII	10,000	75
MSII-3	Landis & Gyr MSII	10,000	75
MSII-4	Landis & Gyr MSII	10,000	75
MSII-5	Landis & Gyr MSII	10,000	75
MSII-6	Landis & Gyr MSII	3,574	75
MX-1	Landis & Gyr MX	10,000	75
MX-2	Landis & Gyr MX	6,422	75
AB1	ABB AB1	287	20
J4ES	Schlumberger J4ES	343	20
J5-1	Schlumberger J5	10,000	75
J5-2	Schlumberger J5	10,000	75
J5-3	Schlumberger J5	10,000	75
J5-4	Schlumberger J5	10,000	75
J5-5	Schlumberger J5	10,000	75
J5-6	Schlumberger J5	10,000	75
J5-7	Schlumberger J5	10,000	75
J5-8	Schlumberger J5	2,931	50
C1S	Schlumberger C1S	22	4

APPENDIX F

OWEN ELECTRIC COOPERATIVE

Owen Electric Cooperative

Single Phase Electric Meters Grouped by Age and Manufacturer

Manufacturer	Total No. Of Active Meters	Number tested
Sangamo – J4S	7,524	93
Sangamo – J5S	12,076	793
Westinghouse - old	1,503	74
Westinghouse – new	1,080	51
GE – old	704	35
GE – new	9,814	504
Landis & Gyr	5,099	241
ABB	1,809	93
	—	—
Total	39,609	1,884

Note:

Old = meters older than 25 years

New = meters less than 25 years

APPENDIX G

SHELBY ENERGY COOPERATIVE



COOPERATIVE, INC.

Appendix G

SHELBY ENERGY COOPERATIVE
SINGLE PHASE ELECTRIC METERS GROUPED BY AGE AND MANUFACTURER

SAMPLE GROUP	MANUFACTURER	TYPE	SERIAL NUMBER	# METERS IN GROUP	SAMPLE SIZE
1	ABB / WESTINGHOUSE	D4S	< 72 000 000	1343	58
2	ABB / WESTINGHOUSE	D5S	> 72 000 000	1010	44
3	DUNCAN / LANDIS & GYR		< 30 000 000	744	32
4	DUNCAN / LANDIS & GYR		> 30 000 000	1430	62
5	GENERAL ELECTRIC		ALL	1951	84
6	SANGAMO/SCHLUMBERGER	J4S	< 69 000 000	4279	180
7	SANGAMO/SCHLUMBERGER	J5S	> 69 000 000	1883	80

APPENDIX H

UNION LIGHT HEAT & POWER COMPANY

ULH&P Proposed Sample Test Groups

Group Name	Meter Types	Installed	Sample Quantity
I70S1	I70S series Oldest	Approx. 8,000	75
I70S2	I70S series Newest	Approx. 8,000	75
MS1	MS series Oldest	Approx. 9,000	75
MS2	MS series Newest	Approx. 9,000	75
J5S1	J5S series Oldest	Approx. 10,000	75
J5S2	J5S series Newest	Approx. 4,000	75
J4S1	J4S series Oldest	Approx. 6,000	75
J4S2	J4S series Newest	Approx. 6,000	75
D3S	D2S/D3S	6850	75
D4S1	D4S series Oldest	8,000	75
D4S2	D4S series Newest	8,000	75
D5S	D5S series	5,662	75
I60	I60/I55/I50	7,875	75
J3S	J3S	5,150	75
MQS	MQS/MKS	7,675	75
S12S	S2S series	400	20
V612S	V612S series	525	35
Total		100,812	1180




COMMONWEALTH OF KENTUCKY
PUBLIC SERVICE COMMISSION
211 SOWER BOULEVARD
POST OFFICE BOX 615
FRANKFORT, KY. 40602
(502) 564-3940

CERTIFICATE OF SERVICE

RE: Case No. 1999-441
INTER-COUNTY ENERGY COOPERATIVE CORPORATION

I, Stephanie Bell, Secretary of the Public Service Commission, hereby certify that the enclosed attested copy of the Commission's Order in the above case was served upon the following by U.S. Mail on October 9, 2000.

See attached parties of record.


Secretary of the Commission

SB/hv
Enclosure

James L. Jacobus
President/CEO
Inter-County Energy Cooperative
Corporation
1009 Hustonville Road
P. O. Box 87
Danville, KY. 40423 0087

Honorable William M. Dishman
Counsel for Inter County Energy
Silliman, Dishman & Nickels
P.O. Box 850
Danville, KY. 40423 0850

Errol K. Wagner
Director of Regulatory Affairs
American Electric Power
1701 Central Avenue
P. O. Box 1428
Ashland, KY. 41105 1428

Honorable Douglas M. Brooks
Senior Counsel Specialist, Reg.
Louisville Gas and Electric
Kentucky Utilities Company
220 West Main Street
Louisville, KY. 40202

Ronald Willhite
Vice President Regulatory Affairs
Louisville Gas and Electric Company
220 W. Main Street
P. O. Box 32010
Louisville, KY. 40232 2010

Honorable James M. Crawford
Counsel for Owen Electric
Crawford & Baxter, P.S.C.
Attorneys at Law
523 Highland Avenue
P.O. Box 353
Carrollton, KY. 41008

Frank Downing
Manager
Owen Electric Cooperative, Inc.
510 South Main Street
P. O. Box 400
Owenton, KY. 40359

Honorable Donald T. Prather
Counsel for Shelby Energy
Mathis, Riggs & Prather, P.S.C.
Attorneys at Law
500 Main Street
P.O. Box 1059
Shelbyville, KY. 40065

Dudley Bottom
General Manager
Shelby Energy Cooperative, Inc.
620 Old Finchville Road
Shelbyville, KY. 40065

Honorable John J. Finnigan
Senior Counsel
The Union Light, Heat & Power Co.
139 E. Fourth Street
25th Fl. Atrium II
Cincinnati, OH. 45202

James B. Gainer
Legal Division
The Union Light Heat & Power Co
139 E. Fourth Street
Cincinnati, OH. 45202

Honorable Mark R. Overstreet
Counsel for American Electric Power
Stites & Harbison
421 West Main Street
Post Office Box 634
Frankfort, KY. 40602 0634

COMMONWEALTH OF KENTUCKY
BEFORE THE PUBLIC SERVICE COMMISSION

In the Matter of:

THE JOINT APPLICATION OF INTER)
COUNTY ENERGY CORPORATION,)
KENTUCKY POWER COMPANY)
D/B/A AMERICAN ELECTRIC POWER)
COMPANY, KENTUCKY UTILITIES)
COMPANY, LOUISVILLE GAS AND)
ELECTRIC COMPANY, OWEN ELECTRIC) CASE NO. 99-441
COOPERATIVE, INC., SHELBY ENERGY)
COOPERATIVE, THE UNION LIGHT,)
HEAT AND POWER COMPANY)
(COLLECTIVELY CALLED UTILITIES))
FOR APPROVAL OF A PILOT METER)
TESTING PLAN PURSUANT TO 807 KAR 5:041,)
SECTIONS 13, 15, 16, 17 AND 22)

O R D E R

By Order dated August 4, 2000, the Commission found that an Amended Sample Meter Test Plan filed by seven electric utilities would be reasonable and acceptable as a 5-year pilot program if revised to incorporate certain enumerated modifications. If the Commission's modifications were acceptable to the utilities, a Revised Amended Sample Meter Test Plan ("Revised Amended Plan") was to be filed within 20 days. On August 24, 2000, the utilities indicated their acceptance of the Commission's modifications by filing a Revised Amended Plan.

Based on a review of the Revised Amended Plan, the Commission finds that certain information has been omitted and certain provisions of the appendices are not in

conformity with the Revised Amended Plan. Specifically, the following corrections need to be made:

1. The Revised Amended Plan, page 8, refers to Attachment Nos. 1 and 2, but the referenced attachments have been omitted.
2. The Revised Amended Plan, Appendix B--Inter County Energy, includes incorrect sample sizes.
3. The Revised Amended Plan, Appendix C--Kentucky Power Company, the meter lot size for meter group "J4S" exceeds the maximum allowable 15,000.
4. The Revised Amended Plan, Appendix F--Owen Electric Cooperative, Inc., the meter lot size for meter group "Sangamo-new" exceeds the maximum allowable 15,000.
5. The Revised Amended Plan, Appendix G--Shelby Energy Cooperative, must include the sample size for each group.

IT IS THEREFORE ORDERED that the utilities shall file within 20 days of the date of this Order a corrected Revised Amended Plan addressing the deficiencies enumerated herein.

Done at Frankfort, Kentucky, this 9th day of October, 2000.

By the Commission

ATTEST:



Executive Director

STITES & HARBISON

ATTORNEYS

August 24, 2000

Thomas M. Dorman
Executive Director
Public Service Commission of Kentucky
211 Sower Boulevard
P.O. Box 615
Frankfort, Kentucky 40602-0615

RE: **P.S.C. Case No. 99-441**

Dear Mr. Dorman:

Pursuant to the Commission's Order dated August 4, 2000, the Joint Applicants are filing herewith their Revised Amended Sample Test Meter Plan (Appendix A to the Joint Application). The filed plan incorporates those modifications required by the Commission in its Order. So that the Commission may have a complete filing, I also am attaching copies of the other appendices, which have not been amended.

For the convenience of the Commission and its staff, a "redlined" version of the Revised Amended Sample Test Meter Plan, without appendices, also is attached.

If you have any questions, please do not hesitate to contact me.

Very truly yours,


Mark R. Overstreet

KE057:KE140:4474:FRANKFORT

421 West Main Street
Post Office Box 634
Frankfort, KY 40602-0634
[502] 223-3477
[502] 223-4124 Fax
www.stites.com

Mark R. Overstreet
[502] 209-1219
moverstreet@stites.com

AUG 24 2000

COMMISSION

Appendix A

**REVISED AMENDED SAMPLE METER
TESTING PILOT PLAN**

REVISED AMENDED SAMPLE METER TESTING PILOT PLAN

I. New Metering Device Tests

1. New metering devices shall be either 100% tested by the utility or 100% tested by the manufacturer.
2. New meters tested by the manufacturer should be sample tested by the utility prior to being placed in service.
3. Utilities must obtain a watt-hour reference standard from each meter manufacturer that supplies them with meters and perform the required testing of those meters and send it to the Commission's Meter Standards Laboratory for testing annually.
4. Utilities must provide certified test results of all new meters received to the Commission's Meter Testing Laboratory annually.
5. National Institute of Standards and Technology comparison test results should also be provided from all of the manufacturers that are performing 100 percent testing as well as traceability charts.

II. Standards for In-Service Performance - Watthour Meters and Electronic Registers

A. Purpose

1. This section shall establish accuracy limits, test plans and inspection procedures for alternating-current revenue watthour meters.
2. Watthour meters placed into service or returned to service shall meet the provisions set forth in this Section test plan.
3. All watthour meters and their associated equipment shall be thoroughly inspected at the time of installation to assure safe and accurate operation.

B. Accuracy Requirements

1. Testing Equipment and Standards

b. All working electronic watt-hour standards when regularly used shall be compared with a master standard every six months. Working watt-hour standards infrequently used shall be compared with a master standard before they are used.

b. All working indicating instruments that affect the customer's quality of service shall be checked against master indicating instruments annually. If the working instrument is found appreciably in error at zero or in error by more than one (1) percent of indication at commonly used scale deflections, it shall be adjusted. A calibration record shall be maintained for each instrument showing all pertinent data and name of person performing tests.

2. Test Loads

Full load shall be approximately 100% of test amperes at unity power factor, light load approximately 10% of test amperes at unity power factor and power factor 100% test amperes 50% lagging power factor. For meters used with current transformers, full load shall be approximately 100% of either meter test amperes or the secondary current rating of the current transformers; light load shall be approximately 10% of the selected full load current.

3. Acceptable Performance

The performance of all in-service watthour meters is considered to be acceptable when the percent registration is not less than 98% or more than 102% as determined in paragraph D(5) of this section.

4. Adjustment Limits

Watthour meters shall be adjusted when the error in registration exceeds 1% at either light load or full load or when the error in registrations exceeds 2% at power factor. The registration of the watthour meter shall be adjusted within these limits as close to 100% as practical.

5. Acceptable Performance for Electronic Registers

The performance of a watthour meter with an electronic register when tested for other than kilowatthour registration shall be acceptable when the error measured does not exceed $\pm 2\%$ of reading.

C. Tests

1. As-found Tests

As-found tests are done to determine the watthour meter accuracy before recalibration.

2. As-left Tests

As-left tests shall be conducted after all adjustments are completed and are in accordance with paragraph B(3) in this section.

D. Performance Tests

1. General

The performance of watthour meters should be verified by an annual test program such as one of the plans listed below. Records shall be maintained on each watthour meter tested. Subsequently, an analysis of the test results for each group of watthour meters shall be made and appropriate action shall be taken. The plans for testing are:

- a. Periodic Interval Plan
- b. Statistical Sampling Plan

2. Objectives

The primary purpose of performance testing is to provide information on which the utility may base a program to maintain meters in an acceptable degree of accuracy throughout their service life.

3. Test Plans

The Periodic Interval Plan is a schedule of testing for watthour meters at various set intervals. The Statistical Sampling Plan provides for the division of watthour meters into homogeneous groups. The annual selection process is random where each watthour meter within each group has an equal chance of being selected.

a. Periodic Interval Plan

The selected periodic interval for testing a watthour meter depends on the size of the service, complexity of the metering system, reliability of the type of watthour meter and/or manufacturer's

recommendations. The plan listed below is a detailed periodic testing schedule by wathour meter and attachments:

Periodic Testing Schedule

		<u>Years Between Testing</u>
(1)	Graphic Watthour Demand	2
(2)	Electromechanical Watthour Meters without surge-proof magnets	8
(3)	Thermal Lagged Demand Meters	16
(4)	Magnetic Tape Demand Records	12
(5)	Electromechanical Watthour Meters with surge-proof magnets and:	
	(a) Mech KWH Register	16
	(b) Mech Demand Registers	10
	(c) Electronic Demand Register	16
	(d) Mech Cam Pulse Initiator	2
	(e) Mech Gear Shutter Pulse Initiator	8
	(f) Electronic Pulse Initiator	12
	(g) Electronic Remote Registers	8
	(h) Electronic TOU Register	16
(6)	Electronic Meter	16
For single phase and polyphase transformer rated meters:		
(7)	Electronic Meters	
	(a) Billing Constant 500 or less	12
	(b) Billing Constant 500 - 10,000	8
	(c) Billing Constant >10,000	4
(8)	Electromechanical Watthour Meters with surge proof magnets	
	(a) Billing Constant 500 or less	8
	(b) Billing Constant >500	4

Test interval is based on the Billing Constant which equals the absolute CT ratio X VT ratio. (i.e. With a 40:1 CT and a 60:1 VT ratio, the Billing Constant is 2400)

b. Statistical Sampling Plan

The Statistical Sampling Plan used shall conform to accepted principles of statistical sampling based on either variables or attributes methods. Meters shall be divided into homogeneous groups, or lots. Meter lot composition will be based on manufacturer and model, assuming like design and construction, with individual lot population not to exceed 15,000 meters. For meter model populations of like design exceeding 15,000 units, multiple lots must be established, with meter age determining lot composition. For example, the first 15,000 meters purchased will comprise Lot #1, the second 15,000 meters purchased will comprise Lot #2, etc. This process will continue until the meter model population is exhausted. Utilities will have the option of using a smaller lot composition, as shown below:

Lot	Meter Type	Meter Population
1	J4S	7,882
2	I70S	10,000
3	I70S	9,130
4	D5S	4,535
5	MS	6,892
6	J5S	9,922
7	MX	8,325

The number of meters to be selected in a Sample Test Plan shall be based on the American National Standard ANSI/ASQC Z1.9-1993.

The performance of the meters will also be based on criteria within this standard.

The minimum quantity of meters pulled shall be based on Inspection Level II, AQL = 2.5, Table A-2 (see Attachment No. 1) and Table B-3 (see Attachment No. 2).

Lot performance shall be deemed acceptable if the full load performance of the meters within the lot meet the acceptability criteria of the ANSI/ASQC Z1.9-1993 based on an upper limit of 102% and a lower limit of 98% using Table B-3 (see Attachment No. 2).

The utility must replace or test all meters in a failed test group within 18 months of the annual report to the Commission. If this requirement should pose an operational hardship on a utility, then the utility should file a request for deviation.

4. Test Records

The data to be recorded for the sample test plan shall include:

- (a) the number of meters in each group at the beginning of the test year
- (b) the number of meters tested
- (c) the analyzed test results

5. Determination of Billing Accuracy

The percentage registration of a watthour meter is, in general, different at light loads than at full loads, and may have still other values at other loads.

The determination of the average percentage registration of a watthour

meter is not a simple matter, since it involves the characteristics of the meter and the loading. The accuracy of meters is more closely associated with the FL test accuracy for most loads since the LL accuracy is only representative of the meter's performance at a very small load conditions.

Average percentage registration is the weighted average of the percentage registration at light load (LL) and at full load (FL), giving the full load registration a weight of four:

$$\text{Weighted Percentage Registration} = \frac{4\text{FL} + \text{LL}}{5}$$

III. Mechanical and Thermal Demand Registers and Pulse Recorders

A. Accuracy Requirements

1. Acceptable Performance

The performance of a mechanical or lagged demand register shall be acceptable when the error in demand registration does not exceed ± 4 percent in terms of full-scale value when tested at any point between 50% and 100% of full-scale.

Under usual operating conditions, the performance of a pulse recording device shall be acceptable when the kilowatthours calculated from the pulse count do not differ by more than 2% from the corresponding kilowatthour meter registration.

2. Test Points

Mechanical or lagged demand registers should be tested at load Points or at above 50% of full scale.

3. Adjustment Limits

When a test of a mechanical or lagged demand register indicates that the error in registration exceeds that specified in paragraph A(1) in this section, the demand register shall be adjusted to within $\pm 2\%$ of full-scale value.

B. Instrument Transformers (Magnetic)

1. Pre-installation Tests

Prior to installation, all new instrument transformers shall be tested for voltage withstand, ratio correction factor, and phase angle. The tests shall be performed in accordance with the criteria established in IEEE C57.13.

2. Instrument Transformers Removed from Service

Instrument transformers removed from service will continue to be tested before retirement or return to service.

APPENDIX B

INTER COUNTY ENERGY COOPERATIVE

Inter County Energy Figure 1

GROUP	MANUFACTURER	TYPE	TOTAL	SAMPLE SIZE
1	General Electric	I60	1070	30
2	General Electric	I70	1899	38
3	General Electric	I55, I55S, I50, I50S	368	30
4	Sangamo	J3S	856	30
5	Sangamo	J4S	5027	101
6	Sangamo	J5S	6886	138
7	Westinghouse	D4S	1902	38
8	Westinghouse	D5S	1015	21
9	ABB	AB1	1345	31
10	Duncan	MX	192	30
		TOTAL	20560	487

NOTES

- 1). Initially, the sample size is 2% of the total population (min of 30).
- 2). The chart above is based on 1997 data used in initial application to PSC.
- 3). The total number of meters on the system include those meters in transition to and from the meter test shop.

APPENDIX C

**KENTUCKY POWER COMPANY
D/B/A
AMERICAN ELECTRIC POWER**

Kentucky Power's Sample Test Groups

Group Name	Meter Types (approximate)	Installed Meters	Sample Qnty.	Comments
I70S1	I70S Series	10,000	75	74,000 Total I70S series currently
I70S2	Oldest	10,000	75	
I70S3	to	10,000	75	
I70S4	Newest	10,000	75	
I70S5		10,000	75	
I70S6		10,000	75	
I70S7		13,700	100	
MS1	MS Series	10,000	75	31,300 Total MS series currently
MS2	Oldest to	10,000	75	
MS3	Newest	11,400	100	
J5S	J5S Series	14,500	100	
J4S	J4S	15,635	100	Slightly over 15,000
D4S1	D4S Oldest	5,000	75	
D4S2	D4S Newest	10,000	75	
D5S1	D5S	4,000	75	Less than 77.5M
D5S2	D5S	1,250	50	Greater than 77.5M (known mfr.change s/n)
I60S	I60S series	2,420	50	
I55S	I55S series	1,438	50	
I50S	I50S series	588	35	
J3S	J3S Series	962	35	
MQS	MQS	267	15	
MX	MX series	2,789	50	
Total			1510	

APPENDIX D

KENTUCKY UTILITIES COMPANY

Sample Test Groups for Kentucky Utilities Company

Group Name	Meter Type	In Service Population	Sample Quantity
I50	GE I50	4,228	75
I55	GE I55	3,963	75
I60-1	GE I60	10,000	75
I60-2	GE I60	10,000	75
I60-3	GE I60	10,000	75
I60-4	GE I60	10,000	75
I60-5	GE I60	1,476	50
I70-1	GE I70	10,000	75
I70-2	GE I70	10,000	75
I70-3	GE I70	10,000	75
I70-5	GE I70	10,000	75
I70-6	GE I70	10,000	75
I70-7	GE I70	10,000	75
I70-8	GE I70	10,000	75
I70-9	GE I70	10,000	75
I70-10	GE I70	10,000	75
I70-11	GE I70	10,000	75
I70-12	GE I70	10,000	75
I70-13	GE I70	10,000	75
I70-14	GE I70	10,000	75
I70-15	GE I70	1,350	50
V612	GE V612	887	35
V62	GE V62	383	20
DS	Westinghouse DS	712	35
D2	Westinghouse D2	1,041	35
D3	Westinghouse D3	3,654	75
D4-1	Westinghouse D4	10,000	75
D4-2	Westinghouse D4	10,000	75
D4-3	Westinghouse D4	10,000	75
D4-4	Westinghouse D4	10,000	75
D4-5	Westinghouse D4	3,279	75
D5	Westinghouse D5	4,515	75
TD	Westinghouse TD	1,218	50
AB1-1	ABB AB1	10,000	75
AB1-2	ABB AB1	3,450	75
JM	Sangamo JM	1,259	50
J2	Sangamo J2	2,188	50
J3-1	Sangamo J3	10,000	75
J3-2	Sangamo J3	5,399	75

J4-1	Sangamo J4	10,000	75
J4-2	Sangamo J4	10,000	75
J4-3	Sangamo J4	10,171	100
J5-1	Schlumberger J5	10,000	75
J5-2	Schlumberger J5	10,000	75
J5-3	Schlumberger J5	10,000	75
J5-4	Schlumberger J5	10,000	75
J5-5	Schlumberger J5	10,000	75
J5-6	Schlumberger J5	10,000	75
J5-7	Schlumberger J5	10,000	75
J5-8	Schlumberger J5	10,000	75
J5-9	Schlumberger J5	10,000	75
J5-10	Schlumberger J5	4,020	75
S12S	Schlumberger S12	96	10
MF	Duncan MF	1,398	50
MK	Duncan MK	1,513	50
MQS	Duncan MQS	7,052	75
MS-1	Duncan MS	10,000	75
MS-2	Duncan MS	10,000	75
MS-3	Duncan MS	10,000	75
MS-4	Duncan MS	10,000	75
MS-5	Duncan MS	8,791	75
MSII	Landis & Gyr MSII	5,077	75
MX-1	Landis & Gyr MX	10,000	75
MX-2	Landis & Gyr MX	2,712	50
DXMS	Landis & Gyr DXMS	258	15
DXMX	Landis & Gyr DXMX	137	10

APPENDIX E

LOUISVILLE GAS & ELECTRIC COMPANY

Sample Test Groups for Louisville Gas and Electric Company

Group Name	Meter Type	In-service Population	Sample Quantity
I50	GE I50	2,859	50
I55	GE I55	3,000	50
DS	Westinghouse DS	1,337	50
J2	Sangamo J2	1,881	50
I60-2	GE I60	10,000	75
I60-2	GE I60	7,877	75
D2S	Westinghouse D2S	2,367	50
J3	Sangamo J3	6,624	75
MQS	Duncan MQS	1,024	35
D4-1	Westinghouse D4	10,000	75
D4-2	Westinghouse D4	9,373	75
J4-1	Sangamo J4	10,000	75
J4-2	Sangamo J4	3,852	75
MS	Duncan MS	9,849	75
I70-1	GE I70	10,000	75
I70-2	GE I70	10,000	75
I70-3	GE I70	10,000	75
I70-4	GE I70	10,000	75
I70-5	GE I70	10,000	75
I70-6	GE I70	10,000	75
I70-7	GE I70	10,000	75
I70-8	GE I70	10,000	75
I70-9	GE I70	10,000	75

I70-10	GE I70	10,000	75
I70-11	GE I70	2,326	50
D5	Westinghouse D5	7,084	75
MSII-1	Landis & Gyr MSII	10,000	75
MSII-2	Landis & Gyr MSII	10,000	75
MSII-3	Landis & Gyr MSII	10,000	75
MSII-4	Landis & Gyr MSII	10,000	75
MSII-5	Landis & Gyr MSII	10,000	75
MSII-6	Landis & Gyr MSII	3,574	75
MX-1	Landis & Gyr MX	10,000	75
MX-2	Landis & Gyr MX	6,422	75
AB1	ABB AB1	287	20
J4ES	Schlumberger J4ES	343	20
J5-1	Schlumberger J5	10,000	75
J5-2	Schlumberger J5	10,000	75
J5-3	Schlumberger J5	10,000	75
J5-4	Schlumberger J5	10,000	75
J5-5	Schlumberger J5	10,000	75
J5-6	Schlumberger J5	10,000	75
J5-7	Schlumberger J5	10,000	75
J5-8	Schlumberger J5	2,931	50
C1S	Schlumberger C1S	22	4

APPENDIX F

OWEN ELECTRIC COOPERATIVE

Owen Electric

Single Phase Electric Meters Grouped by Age and Manufacturer

Manufacturer	Total No. of Active meters	Number Tested
Sangamo-old	1767	93
Sangamo-new	17,833	793
Westinghouse-old	1,503	74
Westinghouse-new	1,080	51
GE - old	704	35
GE - new	9,814	504
Landis & Gyr	5,099	241
ABB	1,809	93
	-----	-----
Total	39,609	1,884

Notes:

Old = meters older than 25 years

New = meters less than 25 years

APPENDIX G

SHELBY ENERGY COOPERATIVE

SHELBY ENERGY COOPERATIVE

SINGLE PHASE ELECTRIC METERS GROUPED BY AGE AND MANUFACTURER

SAMPLE GROUP	MANUFACTURER	TYPE	SERIAL NUMBER	# METERS IN GROUP
1	ABB/WESTINGHOUSE	D4S	< 72 000 000	1343
2	ABB/ WESTINGHOUS	D5S	> 72 000 000	1010
3	DUNCAN/LANDIS & GYR		< 30 000 000	744
4	DUNCAN/LANDIS & GYR		> 30 000 000	1430
5	GENERAL ELECTRIC		ALL	1951
6	SANGAMO/SCHLUMBERGER	J4S	< 69 000 000	4279
7	SANGAMO/SCHLUMBERGER	J5S	> 69 000 000	1883

APPENDIX H

UNION LIGHT HEAT & POWER COMPANY

ULH&P Proposed Sample Test Groups

Group Name	Meter Types	Installed	Sample Quantity
I70S1	I70S series Oldest	Approx. 8,000	75
I70S2	I70S series Newest	Approx. 8,000	75
MS1	MS series Oldest	Approx. 9,000	75
MS2	MS series Newest	Approx. 9,000	75
J5S1	J5S series Oldest	Approx. 10,000	75
J5S2	J5S series Newest	Approx. 4,000	75
J4S1	J4S series Oldest	Approx. 6,000	75
J4S2	J4S series Newest	Approx. 6,000	75
D3S	D2S/D3S	6850	75
D4S1	D4S series Oldest	8,000	75
D4S2	D4S series Newest	8,000	75
D5S	D5S series	5,662	75
I60	I60/I55/I50	7,875	75
J3S	J3S	5,150	75
MQS	MQS/MKS	7,675	75
S12S	S2S series	400	20
V612S	V612S series	525	35
Total		100,812	1180

REDLINED VERSION

REVISED AMENDED SAMPLE METER TESTING PILOT PLAN

I. New Metering Device Tests

1. New metering devices shall be either 100% tested by the utility or 100% tested by the manufacturer.
2. New meters tested by the manufacturer should be sample tested by the utility prior to being placed in service.
3. Utilities must obtain a watt-hour reference standard from each meter manufacturer that supplies them with meters and perform the required testing of those meters and send it to the Commission's Meter Standards Laboratory for testing annually.
4. Utilities must provide certified test results of all new meters received to the Commission's Meter Testing Laboratory annually.
5. National Institute of Standards and Technology comparison test results should also be provided from all of the manufacturers that are performing 100 percent testing as well as traceability charts.

II. Standards for In-Service Performance - Watthour Meters and Electronic Registers

A. Purpose

1. This section shall establish accuracy limits, test plans and inspection procedures for alternating-current revenue watthour meters.
2. Watthour meters placed into service or returned to service shall meet the provisions set forth in this Section test plan.
3. All watthour meters and their associated equipment shall be thoroughly inspected at the time of installation to assure safe and accurate operation.

B. Accuracy Requirements

1. Testing Equipment and Standards

b. All working electronic watt-hour standards when regularly used shall be compared with a master standard every six months. Working watt-hour standards infrequently used shall be compared with a master standard before they are used.

b. All working indicating instruments that affect the customer's quality of service shall be checked against master indicating instruments annually. If the working instrument is found appreciably in error at zero or in error by more than one (1) percent of indication at commonly used scale deflections, it shall be adjusted. A calibration record shall be maintained for each instrument showing all pertinent data and name of person performing tests.

2. Test Loads

Full load shall be approximately 100% of test amperes at unity power factor, light load approximately 10% of test amperes at unity power factor and power factor 100% test amperes 50% lagging power factor. For meters used with current transformers, full load shall be approximately 100% of either meter test amperes or the secondary current rating of the current transformers; light load shall be approximately 10% of the selected full load current.

3. Acceptable Performance

The performance of all in-service wathour meters is considered to be acceptable when the percent registration is not less than 98% or more than 102% as determined in paragraph D(5) of this section.

4. Adjustment Limits

Wathour meters shall be adjusted when the error in registration exceeds 1% at either light load or full load or when the error in registrations exceeds 2% at power factor. The registration of the wathour meter shall be adjusted within these limits as close to 100% as practical.

5. Acceptable Performance for Electronic Registers

The performance of a wathour meter with an electronic register when tested for other than kilowathour registration shall be acceptable when the error measured does not exceed $\pm 2\%$ of reading.

C. Tests

1. As-found Tests

As-found tests are done to determine the wathour meter accuracy before recalibration.

2. As-left Tests

As-left tests shall be conducted after all adjustments are completed and are in accordance with paragraph B(3) in this section.

~~3. Meters Removed from Service~~

~~Meters identified within this test plan may be removed from service and retired without test. Meters identified within this test plan may be returned to service without being tested.~~

D. Performance Tests

1. General

The performance of watthour meters should be verified by an annual test program such as one of the plans listed below. Records shall be maintained on each watthour meter tested. Subsequently, an analysis of the test results for each group of watthour meters shall be made and appropriate action shall be taken. The plans for testing are:

- a. Periodic Interval Plan
- b. Statistical Sampling Plan

2. Objectives

The primary purpose of performance testing is to provide information on which the utility may base a program to maintain meters in an acceptable degree of accuracy throughout their service life.

3. Test Plans

The Periodic Interval Plan is a schedule of testing for watthour meters at various set intervals. The Statistical Sampling Plan provides for the division of watthour meters into homogeneous groups. The annual selection process is random where each watthour meter within each group has an equal chance of being selected.

a. Periodic Interval Plan

The selected periodic interval for testing a watthour meter depends on the size of the service, complexity of the metering system, reliability of the type of watthour meter and/or manufacturer's

recommendations. The plan listed below is a detailed periodic testing schedule by watt-hour meter and attachments:

Periodic Testing Schedule

	<u>Years Between Testing</u>
(1) Graphic Watthour Demand	2
(2) Electromechanical Watthour Meters without surge-proof magnets	8
(3) Thermal Lagged Demand Meters	16
(4) Magnetic Tape Demand Records	12
(5) Electromechanical Watthour Meters with surge-proof magnets and:	
(a) Mech KWH Register	16
(b) Mech Demand Registers	10
(c) Electronic Demand Register	16
(d) Mech Cam Pulse Initiator	2
(e) Mech Gear Shutter Pulse Initiator	8
(f) Electronic Pulse Initiator	12
(g) Electronic Remote Registers	8
(h) Electronic TOU Register	16
(6) Electronic Meter	16
For single phase and polyphase transformer rated meters:	
(7) Electronic Meters	
(a) Billing Constant 500 or less	12
(b) Billing Constant 500 - 10,000	8
(c) Billing Constant >10,000	4
(8) Electromechanical Watthour Meters with surge proof magnets	
(a) Billing Constant 500 or less	8
(b) Billing Constant >500	4

Test interval is based on the Billing Constant which equals the absolute CT ratio X VT ratio. (i.e. With a 40:1 CT and a 60:1 VT ratio, the Billing Constant is 2400)

b. Statistical Sampling Plan

The Statistical Sampling Plan used shall conform to accepted principles of statistical sampling based on either variables or attributes methods. Meters shall be divided into homogeneous groups, or lots. Meter lot composition will be based on manufacturer and model, assuming like design and construction, with individual lot population not to exceed 15,000 meters. For meter model populations of like design exceeding 15,000 units, multiple lots must be established, with meter age determining lot composition. For example, the first 15,000 meters purchased will comprise Lot #1, the second 15,000 meters purchased will comprise Lot #2, etc. This process will continue until the meter model population is exhausted. Utilities will have the option of using a smaller lot composition, as shown below:

Lot	Meter Type	Meter Population
1	J4S	7,882
2	I70S	10,000
3	I70S	9,130
4	D5S	4,535
5	MS	6,892
6	J5S	9,922
7	MX	8,325

The number of meters to be selected in a Sample Test Plan shall be based on the American National Standard ANSI/ASQC Z1.9-1993.

The performance of the meters will also be based on criteria within this standard.

The minimum quantity of meters pulled shall be based on Inspection Level II, AQL = 2.5, Table A-2 (see Attachment No. 1) and Table B-3 (see Attachment No. 2).

Lot performance shall be deemed acceptable if the full load performance of the meters within the lot meet the acceptability criteria of the ANSI/ASQC Z1.9-1993 based on an upper limit of 102% and a lower limit of 98% using Table B-3 (see Attachment No. 2).

The utility must replace or test all meters in a failed test group within 18 months of the annual report to the Commission. ~~If this requirement would pose an operational hardship on a utility, then the utility should file a request for deviation. If, after testing 10% of the meters in a failed lot, the lot performance falls within acceptable ANSI Z1.9 parameters, the utility has the option to cease replacement/ testing and apply the ANSI lightened inspection criteria for the next sampling period. Any future lot failure requires 100% replacement or testing within the subsequent 18 month period.~~

~~Recovery of multiple failed meter lots could pose operational~~
~~hardship. Utilities will present an alternate recovery plan upon the~~

~~failure of multiple groups or when the number of meters in the affected groups exceeds 2.5% of the total meter population.~~

4. Test Records

The data to be recorded for the sample test plan shall include:

- (a) the number of meters in each group at the beginning of the test year
- (b) the number of meters tested
- (c) the analyzed test results

5. Determination of Billing Accuracy

The percentage registration of a watthour meter is, in general, different at light loads than at full loads, and may have still other values at other loads. The determination of the average percentage registration of a watthour meter is not a simple matter, since it involves the characteristics of the meter and the loading. The accuracy of meters is more closely associated with the FL test accuracy for most loads since the LL accuracy is only representative of the meter's performance at a very small load conditions.

Average percentage registration is the weighted average of the percentage registration at light load (LL) and at full load (FL), giving the full load registration a weight of four:

$$\text{Weighted Percentage Registration} = \frac{4\text{FL} + \text{LL}}{5}$$

III. Mechanical and Thermal Demand Registers and Pulse Recorders

A. Accuracy Requirements

1. Acceptable Performance

The performance of a mechanical or lagged demand register shall be acceptable when the error in demand registration does not exceed ± 4 percent in terms of full-scale value when tested at any point between 50% and 100% of full-scale.

Under usual operating conditions, the performance of a pulse recording device shall be acceptable when the kilowatthours calculated from the pulse count do not differ by more than 2% from the corresponding kilowatthour meter registration.

2. Test Points

Mechanical or lagged demand registers should be tested at load Points or at above 50% of full scale.

3. Adjustment Limits

When a test of a mechanical or lagged demand register indicates that the error in registration exceeds that specified in paragraph A(1) in this section, the demand register shall be adjusted to within $\pm 2\%$ of full-scale value.

B. Instrument Transformers (Magnetic)

1. Pre-installation Tests

Prior to installation, all new instrument transformers shall be tested for voltage withstand, ratio correction factor, and phase angle. The tests shall be performed in accordance with the criteria established in IEEE C57.13.

2. Instrument Transformers Removed from Service

Instrument transformers removed from service will continue to be tested before retirement or return to service.



COMMONWEALTH OF KENTUCKY
PUBLIC SERVICE COMMISSION
211 SOWER BOULEVARD
POST OFFICE BOX 615
FRANKFORT, KY. 40602
(502) 564-3940

CERTIFICATE OF SERVICE

RE: Case No. 1999-441
INTER-COUNTY ENERGY COOPERATIVE CORPORATION

I, Stephanie Bell, Secretary of the Public Service Commission, hereby certify that the enclosed attested copy of the Commission's Order in the above case was served upon the following by U.S. Mail on August 4, 2000.

See attached parties of record.

Stephanie Bell
Secretary of the Commission

SB/hv
Enclosure

James L. Jacobus
President/CEO
Inter-County Energy Cooperative
Corporation
1009 Hustonville Road
P. O. Box 87
Danville, KY. 40423 0087

Honorable William M. Dishman
Counsel for Inter County Energy
Silliman, Dishman & Nickels
P.O. Box 850
Danville, KY. 40423 0850

Errol K. Wagner
Director of Regulatory Affairs
American Electric Power
1701 Central Avenue
P. O. Box 1428
Ashland, KY. 41105 1428

Honorable Douglas M. Brooks
Senior Counsel Specialist, Reg.
Louisville Gas and Electric
Kentucky Utilities Company
220 West Main Street
Louisville, KY. 40202

Ronald Willhite
Vice President Regulatory Affairs
Louisville Gas and Electric Company
220 W. Main Street
P. O. Box 32010
Louisville, KY. 40232 2010

Honorable James M. Crawford
Counsel for Owen Electric
Crawford & Baxter, P.S.C.
Attorneys at Law
523 Highland Avenue
P.O. Box 353
Carrollton, KY. 41008

Frank Downing
Manager
Owen Electric Cooperative, Inc.
510 South Main Street
P. O. Box 400
Owenton, KY. 40359

Honorable Donald T. Prather
Counsel for Shelby Energy
Mathis, Riggs & Prather, P.S.C.
Attorneys at Law
500 Main Street
P.O. Box 1059
Shelbyville, KY. 40065

Dudley Bottom
General Manager
Shelby Energy Cooperative, Inc.
620 Old Finchville Road
Shelbyville, KY. 40065

Honorable John J. Finnigan
Senior Counsel
The Union Light, Heat & Power Co.
139 E. Fourth Street
25th Fl. Atrium II
Cincinnati, OH. 45202

James B. Gainer
Legal Division
The Union Light Heat & Power Co
139 E. Fourth Street
Cincinnati, OH. 45202

Honorable Mark R. Overstreet
Counsel for American Electric Power
Stites & Harbison
421 West Main Street
Post Office Box 634
Frankfort, KY. 40602 0634

COMMONWEALTH OF KENTUCKY
BEFORE THE PUBLIC SERVICE COMMISSION

In the Matter of:

THE JOINT APPLICATION OF INTER COUNTY ENERGY)
CORPORATION, KENTUCKY POWER COMPANY D/B/A)
AMERICAN ELECTRIC POWER COMPANY, KENTUCKY)
UTILITIES COMPANY, LOUISVILLE GAS & ELECTRIC,)
OWEN ELECTRIC COOPERATIVE, INC., SHELBY ENERGY) CASE NO.
COOPERATIVE, THE UNION LIGHT, HEAT AND POWER) 99-441
COMPANY (COLLECTIVELY CALLED UTILITIES) FOR)
APPROVAL OF A PILOT METER TESTING PLAN)
PURSUANT 807 KAR 5:041, SECTIONS 13, 15, 16, 17 AND 22)

O R D E R

Inter County Energy Cooperative Corporation, Kentucky Power Company d/b/a American Electric Power, Kentucky Utilities Company, Louisville Gas and Electric Company, Owen Electric Cooperative, Inc., Shelby Energy Cooperative, Inc., and The Union Light, Heat and Power Company ("Utilities") filed a joint application on October 29, 1999 for approval of a pilot meter testing plan in lieu of the meter tests procedures prescribed by regulation 807 KAR 5:041, Section 16. The utilities indicated that the Pilot Plan will enhance the ability to detect and remove any group of meters that does not meet prescribed performance standards. The Utilities estimate that a saving of approximately \$1 million will be realized by the end of the pilot program. The proposed sample meter plan will be in effect for 5 years. In addition to the proposed sample meter plan, the Utilities are requesting deviation from 807 KAR 5:041, Section 13

(Testing Equipment and Standards), Section 15 (Testing of Metering Equipment), and Section 17 (Test Procedures and Accuracy Requirements).

An informal conference was held at the Commission's offices on March 8, 2000. On April 17, 2000, the Utilities filed an amended application that reflects changes to the pilot plan discussed at the informal conference.

The proposed sample meter plan is based on American National Standard Code "ANSI C121.1- 1995 and ASQCZ1.9-1993." The major components of the sample plan and the Commission's finding on each component are described below:

a. All new metering devices shall be 100 percent tested either by the manufacturer or by the Utility. The Commission finds that new meters tested by the manufacturer should be sample tested by the utility prior to being placed in service to assure that the meter accuracy was not affected during shipment.

b. Meter lot composition or group will be based on manufacturer and model, assuming like design and construction, with individual lot population not to exceed 15,000 meters. The Commission finds that to be reasonable.

c. The Utility must replace or test all meters in a failed test group within 18 months. If, after testing 10 percent of the meters in a failed lot, the lot performance falls within acceptable ANSI Z1.9 parameters, the Utility has the option to cease replacement/testing and apply the ANSI tightened inspection criteria for the next sampling period. Any future lot failure requires 100 percent replacement or testing within the subsequent 18-month period. The Commission finds that if a sample fails, but subsequent testing of another 10 percent provides acceptable results, then this suggests that the meters in that group are not homogeneous. A key element of any

sample-testing program is the formation of a homogenous group. Thus, if a test group of meters fails, the whole group must be tested.

d. In the event a utility experiences a failure of multiple groups or when the number of meters in the affected groups exceeds 3.5 percent of the total meter population, the sample meter plan provides that in lieu of removing all meters the utility may propose an alternative removal plan. The basis for this proposal is possible operational hardship if a substantial number of meters must be replaced. The Commission finds that the Utilities should test all the meters in multiple failure groups within 18 months. If this requirement should pose an operational hardship on a utility, then the utility should file a request for deviation. The Utilities do not justify or explain why testing all the meters in such a case could pose an operational hardship.

The Utilities are requesting deviation from KAR 5:041, Section 15(3), which states, "Metering equipment, including instrument transformers and demand meters, shall be tested for accuracy prior to being placed in service, periodically in accordance with the schedule below, upon complaint, when suspected of being in error, or when removed from service for any cause." The Utilities' proposal will eliminate the requirement to test a meter after it is being removed from service. The Utilities state, "A meter routinely removed from service for reasons other than sample testing or damage should perform no differently than the sample group." The majority of the expense to test the meter is the cost to remove the meter from the field. Since the meter is planned for removal, the saving for not testing it is minimal. The Commission finds that testing meters removed from service will provide an explanation in complaint cases where a

customer bill has increased when a new meter was installed because the Utility will have a test record to indicate that the old meter was slow.

The Utilities are requesting to extend the time intervals for testing certain metering equipment, including instrument transformer meters and demand meters, because these meters have historically realized high levels of accuracy. The Commission finds that the requested deviation is reasonable.

Based on the evidence of record, the Commission finds that the proposed sample meter plan will be reasonable only if revised to reflect the changes listed below.

1. Removal of the following items from the sample meter plan:

a. Page 8 of Appendix A: "If, after testing 10 percent of the meters in a failed lot, the lot performance falls within acceptable ANSI Z1.9 parameters, the utility has the option to cease replacement/testing and apply the ANSI tightened inspection criteria for the next sampling period."

b. Pages 8, 9 of Appendix A: "Removal of multiple failed meter lots could pose operational hardship. Utilities will propose an alternate removal plan upon the failure of multiple groups or when the number of meters in the affected groups exceeds 3.5 percent of the total meter population."

c. Page 3 of Appendix A: "Meters identified within this test plan may be removed from service and retired without test. Meters identified within this test plan may be returned to service without being tested."

2. New meters tested by the manufacturer should be sample tested by the utility prior to being placed in service.

3. The Utilities must obtain a watt-hour reference standard from each meter manufacturer that supplied them with meters and perform the required testing of those meters and send it to the Commission's Meter Standards Laboratory for testing annually.

4. The Utilities must provide certified test results of all new meters received to the Commission's Meter Testing Laboratory annually.

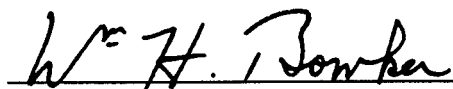
5. National Institute of Standards and Technology comparison test results should also be provided from all of the manufacturers that are performing 100 percent testing as well as traceability charts.

IT IS THEREFORE ORDERED that the Utilities shall have 20 days from the date of this Order to file a revised amended sample meter test plan reflecting the modifications discussed in the findings above. If a revised plan is not filed within that time, the proposed amended plan is denied.

Done at Frankfort, Kentucky, this 4th day of August, 2000.

By the Commission

ATTEST:



Executive Director, Acting

COMMONWEALTH OF KENTUCKY
BEFORE THE PUBLIC SERVICE COMMISSION

RECEIVED

MAY 11 2000

PUBLIC SERVICE
COMMISSION

In the Matter of:

THE JOINT APPLICATION OF INTER COUNTY)
ENERGY CORPORATION, KENTUCKY POWER)
COMPANY D/B/A AMERICAN ELECTRIC POWER)
COMPANY, KENTUCKY UTILITIES COMPANY,)
LOUISVILLE GAS & ELECTRIC, OWEN)
ELECTRIC COOPERATIVE, INC, SHELBY)
ENERGY COOPERATIVE, THE UNION LIGHT,)
HEAT AND POWER COMPANY)
(COLLECTIVELY CALLED UTILITIES) FOR)
APPROVAL OF A PILOT METER TESTING)
PLAN PURSUANT TO 807 KAR 5:041,)
SECTIONS 13, 15, 16, 17 AND 22)

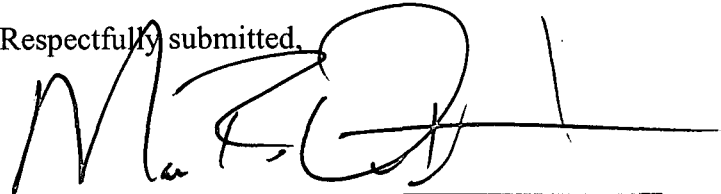
CASE NO. 99-441

**Supplementation of Data Response
And Notice of Waiver of Hearing**

Inter County Energy Corporation, Kentucky Power Company d/b/a American Electric Power, Kentucky Utilities Company, Louisville Gas & Electric, Owen Electric Cooperative, Inc., Shelby Energy Cooperative and The Union Light, Heat and Power Company ("Utilities") hereby supplement their Response to Data Request No. 6 of the Supplemental Data Requests from the March 8, 2000 Informal Conference. The Utilities were seeking to clarify the Request at the time the Response initially was submitted and indicated they would supplement their Response.

The Utilities also waive hearing in this matter, and in accordance with the Commission's May 5, 2000 Order request that this matter be submitted for decision based on the record, including this supplemental response.

Respectfully submitted,

A handwritten signature in black ink, appearing to read 'M. Overstreet', written over a horizontal line.

Mark R. Overstreet
STITES & HARBISON
421 West Main Street
P.O. Box 634
Frankfort, Kentucky 40602
Telephone: (502) 223-3477
COUNSEL FOR KENTUCKY POWER
COMPANY D/B/A AMERICAN ELECTRIC
POWER

KE057:KE140:3966:FRANKFORT

Kentucky Power Company
d/b/a American Electric Power
In Service Meter Test Data

Year	Activity	Tests	Retired	Slow	Fast	Fast/Slow Meters Retired (+/-2%)
1995	Field -Other	3				
1995	Shop -Old	7823				
1995	PSC Test	1				
1995	Maint.	1833				
1995	High Bill	<u>76</u>				
1995	Total	9736	2654	32	7	15
1996	Field -Other	3				
1996	Shop -Old	7211				
1996	Field-Initial	1				
1996	Maint.	6459				
1996	High Bill	<u>131</u>				
1996	Total	13805	4321	114	5	76
1997	Field -Other	4				
1997	Shop -Old	10883				
1997	Field-Initial	2				
1997	Maint.	1481				
1997	High Bill	<u>113</u>				
1997	Total	12483	3531	146	6	82

Note: Shop - Old: Damaged meters, normal removals - customer moves, etc.
Maint. : 25 year meters, special removes

kentuckyPSCrequest32000, 95-97

KENTUCKY UTILITIES COMPANY

"OTHER" METER TESTS

Year	Activity	# of Tests	More Than 2% Fast	More Than 2% Slow
1996	Temporary	12,949		
	Field Test	498		
	Purpa	354		
	Deduct	1,769		
	Vandalism/Damaged	2,024		
	Special Projects:			
	T.U.R.T.L.E.	-		
	A.M.R.	1,006		
	A.I.M.	11		
	Meters Tested but not set in 1 year	2,645		
	Inspections/Prob. Reports	3,233		
	Misc.(Vacant)	3,585		
	TOTAL	28,074	23 *	237 *
	1997	Temporary	11,803	
Field Test		506		
Purpa		380		
Deduct		1,712		
Vandalism/Damaged		1,656		
Special Projects:				
T.U.R.T.L.E.		-		
A.M.R.		936		
A.I.M.		16		
Meters Tested but not set in 1 year		2,506		
Inspections/Prob. Reports		3,293		
Misc.(Vacant)		3,008		
TOTAL		25,816	14 *	179 *
1998		Temporary	11,697	
	Field Test	260		
	Purpa	246		
	Deduct	1,685		
	Vandalism/Damaged	1,620		
	Special Projects:			
	T.U.R.T.L.E.	22		
	A.M.R.	1,192		
	A.I.M.	155		
	Meters Tested but not set in 1 year	2,126		
	Inspections/Prob. Reports	2,511		
	Misc.(Vacant)	2,252		
	TOTAL	23,766	20 *	188 *

* Note: Includes Total Meter Population Consisting of: Sample, Periodic, New and Other

**LOUISVILLE GAS AND ELECTRIC
"OTHER" METER TESTS**

Year	Activity	# of Tests	More Than 2% Fast	More Than 2% Slow
1996	Temporary	6,497		
	Inspections/Prob. Reports	2,337		
	TOTAL	8,834	21 *	130 *
1997	Temporary	7,659		
	Inspections/Prob. Reports	2,210		
	TOTAL	9,869	11 *	104 *
1998	Temporary	5,991		
	Inspections/Prob. Reports	2,557		
	TOTAL	8,548	17 *	80 *

* Note: Includes Total Meter Population Consisting of: Sample, Periodic, New and Other

Case 99-441

**UNION LIGHT HEAT & POWER
"OTHER" METER TESTS**

Year	1996	1997	1998
Sample	2,266	2,314	2,993
25 year tests	106	1,894	1,149
Periodic	706	1,081	633
New	5,261	13,155	9,764
Other	2,581	3,617	4,253
Total	10,920	22,061	18,792
Over 2% Fast	15	48*	12
Over 2% Slow	143	97	135

*Approximately 29 of the meters were actually DNR meters but were recorded as over 2% fast because of a problem with test equipment/test procedures.

Explanation of "Other" Category

This category includes meters removed from temporary services, demolition/service removal, service upgrade or replacement, vandalism/damage, AMR pilot programs, and meters tested but not set in one year. ULH&P does not have data readily available for the exact quantities of meters tested for these reasons for the years listed.



COMMONWEALTH OF KENTUCKY
PUBLIC SERVICE COMMISSION
211 SOWER BOULEVARD
POST OFFICE BOX 615
FRANKFORT, KY. 40602
(502) 564-3940

May 5, 2000

To: All parties of record

RE: Case No. 1999-441

We enclose one attested copy of the Commission's Order in
the above case.

Sincerely,

A handwritten signature in black ink that reads "Stephanie Bell". The signature is written in a cursive style with a large, looped initial 'S'.

Stephanie Bell
Secretary of the Commission

SB/hv
Enclosure

James L. Jacobus
President/CEO
Inter-County Energy Cooperative
Corporation
1009 Hustonville Road
P. O. Box 87
Danville, KY 40423 0087

Honorable William M. Dishman
Counsel for Inter County Energy
Silliman, Dishman & Nickels
P.O. Box 850
Danville, KY 40423 0850

Errol K. Wagner
Director of Regulatory Affairs
American Electric Power
1701 Central Avenue
P. O. Box 1428
Ashland, KY 41105 1428

Honorable Douglas M. Brooks
Senior Counsel Specialist, Reg.
Louisville Gas and Electric
Kentucky Utilities Company
220 West Main Street
Louisville, KY 40202

Ronald Willhite
Vice President Regulatory Affairs
Louisville Gas and Electric Company
220 W. Main Street
P. O. Box 32010
Louisville, KY 40232 2010

Honorable James M. Crawford
Counsel for Owen Electric
Crawford & Baxter, P.S.C.
Attorneys at Law
523 Highland Avenue
P.O. Box 353
Carrollton, KY 41008

Frank Downing
Manager
Owen Electric Cooperative, Inc.
510 South Main Street
P. O. Box 400
Owenton, KY 40359

Honorable Donald T. Prather
Counsel for Shelby Energy
Mathis, Riggs & Prather, P.S.C.
Attorneys at Law
500 Main Street
P.O. Box 1059
Shelbyville, KY 40065

Dudley Bottom
General Manager
Shelby Energy Cooperative, Inc.
620 Old Finchville Road
Shelbyville, KY 40065

Honorable John J. Finnigan
Senior Counsel
The Union Light, Heat & Power Co.
139 E. Fourth Street
25th Fl. Atrium II
Cincinnati, OH 45202

James B. Gainer
Legal Division
The Union Light Heat & Power Co
139 E. Fourth Street
Cincinnati, OH 45202

Honorable Mark R. Overstreet
Counsel for American Electric Power
Stites & Harbison
421 West Main Street
Post Office Box 634
Frankfort, KY 40602 0634

COMMONWEALTH OF KENTUCKY
BEFORE THE PUBLIC SERVICE COMMISSION

In the Matter of:

THE JOINT APPLICATION OF KENTUCKY UTILITIES;)
INTER COUNTY ENERGY COOPERATIVE)
CORPORATION; KENTUCKY POWER COMPANY D/B/A)
AMERICAN ELECTRIC POWER; KENTUCKY UTILITIES)
COMPANY; LOUISVILLE GAS AND ELECTRIC COMPANY;)
OWEN ELECTRIC COOPERATIVE; SHELBY ENERGY)
COOPERATIVE; THE UNION LIGHT, HEAT AND POWER)
COMPANY (COLLECTIVELY CALLED "UTILITIES") FOR)
APPROVAL OF A PILOT METER TESTING PLAN)
PURSUANT TO 807 KAR 5:041, SECTIONS 13, 15, 16,)
17, AND 22)

CASE NO.
99-441

O R D E R

The Commission, having considered the amended application for a meter testing pilot plan received on April 17, 2000 and finding good cause, HEREBY ORDERS that:

1. The amended application is accepted for filing.
2. This case shall be submitted for a decision based on the existing record unless a written request for a hearing is filed within 10 days of the date of this Order.

Done at Frankfort, Kentucky, this 5th day of May, 2000.

By the Commission

ATTEST:

W. H. Bowker
Deputy Executive Director



PAUL E. PATTON, GOVERNOR

RONALD B. McCLOUD, SECRETARY
PUBLIC PROTECTION AND
REGULATION CABINET

MARTIN J. HUELSMANN
EXECUTIVE DIRECTOR
PUBLIC SERVICE COMMISSION

COMMONWEALTH OF KENTUCKY
PUBLIC SERVICE COMMISSION

211 SOWER BLVD.
POST OFFICE BOX 615
FRANKFORT, KENTUCKY 40602-0615
www.psc.state.ky.us
502-564-3940
FAX 502-564-3460

B.J. HELTON
CHAIRMAN

EDWARD J. HOLMES
VICE CHAIRMAN

GARY W. GILLIS
COMMISSIONER

April 26, 2000

Mark R. Overstreet, Esq.
Stites & Harbison
421 West Main Street
Post Office box 634
Frankfort, Kentucky 40602

RE: Petition for Confidential Protection
Case No. 99-441

Dear Mr. Overstreet:

The Commission has received your petition filed April 17, 2000, to protect as confidential the data in support of the pilot meter testing plant. A review of the information has determined that LG&E et.al. is entitled to the protection requested on the grounds relied upon in the petition, and the information will be withheld from public inspection.

If the information becomes publicly available or no longer warrants confidential treatment, you are required by 807 KAR 5:001, Section 7(9)(a) to inform the Commission so that the information may be placed in the public record.

Sincerely,

A handwritten signature in black ink, appearing to read "Martin J. Huelsmann", followed by a horizontal line.

Martin J. Huelsmann
Executive Director



STITES & HARBISON

ATTORNEYS

RECEIVED

APR 17 2000

PUBLIC SERVICE
COMMISSION

421 West Main Street
Post Office Box 634
Frankfort, KY 40602-0634
(502) 223-3477
(502) 223-4124 Fax
www.stites.com

April 17, 2000

BY HAND DELIVERY

Mr. Martin J. Huelsmann
Executive Director
Public Service Commission of Kentucky
211 Sower Boulevard
P.O. Box 615
Frankfort, KY 40602-0615

Mark R. Overstreet
(502) 209-1219
moverstreet@stites.com

RE: P.S.C. Case No. 99-441

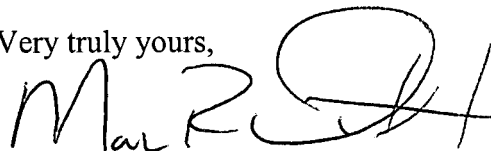
Dear Mr. Huelsmann:

Please find enclosed and accept for filing the Applicants' Responses to the Data Requests propounded by the Commission Staff at the March 8, 2000 informal conference. With respect to the Response to Data Request No. 1, the Applicants also are filing a Petition for Confidential Treatment of the electric meter testing procedures and standards for General Electric Company and Schlumberger Industries, Electric and Gas Division. Accordingly, in conformity with the Commission's regulations and KRS 61.878 please find enclosed and accept for filing ten redacted copies of the information for which confidential treatment is sought, as well as one copy with the confidential information highlighted.

The Applicants also are amending their application in this matter to address certain issues raised by the Commission Staff. Accordingly, please accept for filing the Amended Application. For the convenience of the Commission and Staff, the Applicants are filing a "clean" version of the Amended Application, as well as a redlined version that shows the modifications.

If you have any questions, please do not hesitate to contact me.

Very truly yours,



Mark R. Overstreet

KE057:00KE4:3839:FRANKFORT

RECEIVED

APR 17 2000

PUBLIC SERVICE
COMMISSION

COMMONWEALTH OF KENTUCKY
BEFORE THE PUBLIC SERVICE COMMISSION

In the Matter of:

THE JOINT APPLICATION OF INTER COUNTY)
ENERGY CORPORATION, KENTUCKY POWER)
COMPANY D/B/A AMERICAN ELECTRIC POWER)
COMPANY, KENTUCKY UTILITIES COMPANY,)
LOUISVILLE GAS & ELECTRIC, OWEN)
ELECTRIC COOPERATIVE, INC, SHELBY)
ENERGY COOPERATIVE, THE UNION LIGHT,)
HEAT AND POWER COMPANY)
(COLLECTIVELY CALLED UTILITIES) FOR)
APPROVAL OF A PILOT METER TESTING)
PLAN PURSUANT TO 807 KAR 5:041,)
SECTIONS 13, 15, 16, 17 AND 22)

CASE NO. 99-441

Motion for Leave to File Amended Joint Application

Inter County Energy Corporation, Kentucky Power Company d/b/a American Electric Power, Kentucky Utilities Company, Louisville Gas & Electric, Owen Electric Cooperative, Inc., Shelby Energy Cooperative and The Union Light, Heat and Power Company (“Utilities”) move the Public Service Commission of Kentucky (“Commission”) pursuant to 807 KAR 5:001, Section 3(5) for leave to file their Amended Joint Application, and in support thereof state:

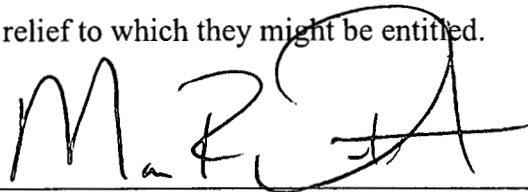
1. On October 29, 1999, the Utilities filed their Joint Application in this matter, seeking, *inter alia*, leave to utilize a Pilot Electric Meter Testing Plan in lieu of the testing procedures prescribed by the Commission’s regulations.

2. On March 8, 2000, the Utilities and Commission Staff met in an informal conference to discuss various issues involving the proposed Pilot Electric Meter Testing Plan.

3. Based on discussions at the informal conference, the Utilities have prepared an amended Joint Application. The amended Joint Application addresses certain issues raised by the Staff at the informal conference.

Wherefore, Inter County Energy Corporation, Kentucky Power Company d/b/a American Electric Power, Kentucky Utilities Company, Louisville Gas & Electric, Owen Electric Cooperative, Inc., Shelby Energy Cooperative and The Union Light, Heat and Power Company respectfully request:

1. That the amended Joint Application be accepted for filing;
2. That they be accorded all other relief to which they might be entitled.



Mark R. Overstreet
STITES & HARBISON
421 West Main Street
P.O. Box 634
Frankfort, Kentucky 40602
Telephone: (502) 223-3477
COUNSEL FOR KENTUCKY POWER
COMPANY D/B/A AMERICAN ELECTRIC
POWER

KENTUCKY PUBLIC SERVICE COMMISSION

JOINT AMENDED APPLICATION ON BEHALF OF

Inter County Energy Cooperative Corporation

Kentucky Power Company d/b/a American Electric Power

Kentucky Utilities Company

Louisville Gas and Electric Company

Owen Electric Cooperative, Inc.

Shelby Energy Cooperative, Inc.

The Union Light, Heat and Power Company

PILOT METER TESTING PLAN

COMMONWEALTH OF KENTUCKY
BEFORE THE PUBLIC SERVICE COMMISSION

In the Matter of: Case No. 99-441

THE JOINT AMENDED APPLICATION OF THE UTILITIES:)
INTER COUNTY ENERGY COOPERATIVE CORP.,)
KENTUCKY POWER COMPANY, d/b/a AMERICAN)
ELECTRIC POWER, KENTUCKY UTILITIES COMPANY,)
LOUISVILLE GAS AND ELECTRIC, OWEN ELECTRIC)
COOPERATIVE, SHELBY ENERGY COOPERATIVE,)
THE UNION LIGHT HEAT AND POWER COMPANY)
COLLECTIVELY CALLED (“UTILITIES”) FOR APPROVAL)
OF A PILOT METER TESTING PLAN PURSUANT TO)
807 KAR 5:041, SECTIONS 13, 15, 16, 17 and 22)

JOINT AMENDED APPLICATION

The Joint Applicants, Inter County Energy Cooperative Corporation, Kentucky Power Company d/b/a American Electric Power, Kentucky Utilities Company, Louisville Gas and Electric, Owen Electric Cooperative Inc., Shelby Energy Cooperative Inc., The Union Light, Heat and Power Company, (collectively hereinafter called “Utilities”), move the Public Service Commission of Kentucky pursuant to 807 KAR 5:041, Sections 13, 15, 16, 17 and 22, to approve the amended Pilot Meter Testing Plan filed herewith in lieu of the meter tests procedures prescribed by the Commission in its regulation 807 KAR 5:041, Sections 13, 15, 16, and 17, respectively. The Utilities also request the Commission to approve each utility’s plan for implementation. The amended Pilot Meter Testing Plan will be in effect for a five year period beginning July 1, 2000.

I. BACKGROUND

Meter accuracy regulations in Kentucky were developed many years ago and metering technology in the electric industry has changed significantly since the inception of these regulations. While the development of meter technology has resulted in improved meter accuracy and dependability, meter accuracy regulations have not been updated to be consistent with these technological advances. As a result, the Utilities believe that the institution of a pilot meter testing plan is appropriate at this time.

II. WHY USE A PILOT PROGRAM?

The Utilities recognize that the current regulations apply to all utilities, including gas, water and electric industries. Yet, the technological advances in electric metering exceed what has occurred in the gas and water industries. For example, metering technology advances in the electric industry have resulted in the use of electromechanical meters with magnetic suspensions and surge-proof magnets. Performance data indicate that meter accuracy is significantly improved compared to earlier generation ball/jewel bearing suspension meters.

The Pilot concept offers a method of evaluating whether the proposed deviation is beneficial to the Utilities and to their customers. The meter population will be sufficient to allow for a thorough and statistically reliable evaluation before a statewide rollout of revised regulations. Any required pilot program revision will be accomplished before the actual regulations change, so the Pilot offers additional flexibility for potential modifications.

III. DESCRIPTION OF PILOT METER TESTING PLAN

The Pilot program is based on American National Standard Code for Electricity Metering, ANSI C12.1-1995. The details of the amended Pilot Meter Testing Plan, as applicable to the Utilities, are attached in Appendix A. Identification of the utility-specific sample test groups is provided in Appendices B through H. The Pilot plan establishes accuracy limits, test plans and inspection procedures for alternating-current revenue producing wathour meters. The purpose of the Pilot Plan is to enhance the ability to detect and remove, at the earliest possible date, any group of meters that does not meet prescribed performance standards.

The major components of the Pilot Meter Testing Plan are described below.

1. All new metering devices shall be 100% tested: Either by the manufacturer or by the utility.
2. Use of a statistical sampling plan that will allow the Utilities to target meters by narrowly defined "lots", resulting in a greater probability of detecting "bad meters". Meter lot composition will be based on manufacturer and model, assuming like design and construction, with individual lot population not to exceed 15,000 meters. The meter lot composition for each utility is shown in Appendices B through H.

3. The utility must replace or test all meters in a failed test group within 18 months of the annual report to the Commission. If, after testing 10% of the meters in a failed lot, the lot performance falls within acceptable ANSI Z1.9 parameters, the utility has the option to cease replacement/testing and apply the ANSI tightened inspection criteria for the next sampling period. Any future lot failure requires 100% replacement or testing within the subsequent 18 month period.

4. Elimination of the 25 Year Rule.

Currently the Utilities are required to test every single-phase meter within 25 years. Smoothing annual test volumes requires that utilities test 4% of the meter population each year. In practice, the 25-year rule creates a periodic override to a sample test plan. Establishment of narrow ANSI test groups along with the elimination of the 25-year rule will concentrate resources on improving the detection and replacing suspect metering equipment. Considerable resources are currently focused on testing large numbers of meters with outstanding historical performance. In general, adoption of an ANSI sample program will mean testing fewer meters out of more groups and result in an improved testing program at a lower cost.

5. Elimination of requirement to test meter after being removed.

Sample plans are based on the assumption that the selected sample accurately represents the parent population. A meter routinely removed from service for reasons other than sample testing or damage should perform no differently than

the sample group. Reinstallation of these meters at a new location without a test closely parallels the way customers routinely change residences without a meter test. In the absence of physical damage it is assumed that the meter is performing like its parent population.

6. Extension for time intervals for testing certain metering equipment including instrument transformer meters and demand meters. These meters have historically realized high levels of accuracy.

IV. BENEFITS OF THE PILOT METER TESTING PLAN

The benefits of the Pilot Plan include increasing meter accuracy and dependability, as well as the control of meter operating costs. Accuracy will be enhanced by the annual testing of a scientifically drawn sample of meter groups. Meter groups that demonstrate substandard performance will be identified and removed earlier than under the existing testing program. The Utilities estimate that these programs will save the companies and their customers on average \$1,000,000 per year by the end of the pilot period. Meter replacement cost could offset savings during the initial pilot years since revised meter groupings will quickly identify poor performing meters.

V. IMPLEMENTATION PLAN

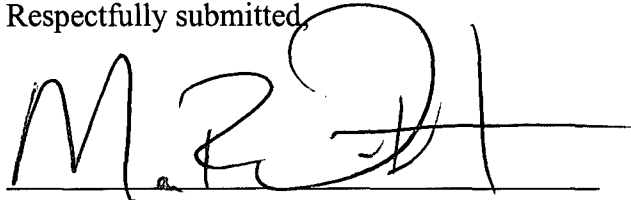
The Utilities propose that the Pilot Plan be implemented beginning July 1, 2000. The Plan will remain in effect for five years. At the end of the fourth year, the Utilities will prepare an evaluation of the costs and benefits of the Pilot program and will submit a report to the

Commission by January 1, 2005. At the end of each year, each utility will submit new sample test groups based on its then current meter population, if such changes are necessary.

VI. RECOMMENDATION

For reasons set forth above, the Utilities move the Commission to approve the Pilot Meter Testing Plan effective July 1, 2000.

Respectfully submitted,

A handwritten signature in black ink, appearing to read 'M. R. Overstreet', written over a horizontal line.

Mark R. Overstreet

STITES & HARBISON

421 West Main Street

P. O. Box 634

Frankfort, Kentucky 40602

Telephone: (502)223-3477

COUNSEL FOR JOINT APPLICANTS

APPENDIX A

METER TESTING PILOT PLAN

AMENDED METER TESTING PILOT PLAN

I. New Metering Device Tests

New metering devices shall be either 100% tested by the utility or 100% tested by the manufacturer.

II. Standards for In-Service Performance - Watthour Meters and Electronic Registers

A. Purpose

1. This section shall establish accuracy limits, test plans and inspection procedures for alternating-current revenue watthour meters.
2. Watthour meters placed into service or returned to service shall meet the provisions set forth in this Section test plan.
3. All watthour meters and their associated equipment shall be thoroughly inspected at the time of installation to assure safe and accurate operation.

B. Accuracy Requirements

1. Testing Equipment and Standards

- b. All working electronic watt-hour standards when regularly used shall be compared with a master standard every six months. Working watt-hour standards infrequently used shall be compared with a master standard before they are used.
- b. All working indicating instruments that affect the customer's quality of service shall be checked against master indicating instruments annually. If the working instrument is found appreciably in error at zero or in error by more than one (1) percent

of indication at commonly used scale deflections, it shall be adjusted. A calibration record shall be maintained for each instrument showing all pertinent data and name of person performing tests.

2. Test Loads

Full load shall be approximately 100% of test amperes at unity power factor, light load approximately 10% of test amperes at unity power factor and power factor 100% test amperes 50% lagging power factor. For meters used with current transformers, full load shall be approximately 100% of either meter test amperes or the secondary current rating of the current transformers; light load shall be approximately 10% of the selected full load current.

3. Acceptable Performance

The performance of all in-service watt-hour meters is considered to be acceptable when the percent registration is not less than 98% or more than 102% as determined in paragraph D(5) of this section.

4. Adjustment Limits

Watt-hour meters shall be adjusted when the error in registration exceeds 1% at either light load or full load or when the error in registrations exceeds 2% at power factor. The registration of the watt-hour meter shall be adjusted within these limits as close to 100% as practical.

5. Acceptable Performance for Electronic Registers

The performance of a watt-hour meter with an electronic register when tested for other than kilowatt-hour registration shall be acceptable when the error measured does not exceed $\pm 2\%$ of reading.

C. Tests

1. As-found Tests

As-found tests are done to determine the watt-hour meter accuracy before recalibration.

2. As-left Tests

As-left tests shall be conducted after all adjustments are completed and are in accordance with paragraph B(3) in this section.

3. Meters Removed from Service

Meters identified within this test plan may be removed from service and retired without test. Meters identified within this test plan may be returned to service without being tested.

D. Performance Tests

1. General

The performance of watt-hour meters should be verified by an annual test program such as one of the plans listed below. Records shall be maintained on each watt-hour meter tested. Subsequently, an analysis of the test results for each group of watt-hour meters shall be made and appropriate action shall be taken. The plans for testing are:

- a. Periodic Interval Plan
- b. Statistical Sampling Plan

2. Objectives

The primary purpose of performance testing is to provide information on which the utility may base a program to maintain meters in an acceptable degree of accuracy throughout their service life.

3. Test Plans

The Periodic Interval Plan is a schedule of testing for wathour meters at various set intervals. The Statistical Sampling Plan provides for the division of wathour meters into homogeneous groups. The annual selection process is random where each wathour meter within each group has an equal chance of being selected.

a. Periodic Interval Plan

The selected periodic interval for testing a wathour meter depends on the size of the service, complexity of the metering system, reliability of the type of wathour meter and/or manufacturer's recommendations. The plan listed below is a detailed periodic testing schedule by wathour meter and attachments:

Periodic Testing Schedule

	<u>Years Between Testing</u>
(1) Graphic Watthour Demand	2
(2) Electromechanical Watthour Meters without surge-proof magnets	8
(3) Thermal Lagged Demand Meters	16
(4) Magnetic Tape Demand Records	12
(5) Electromechanical Watthour Meters with surge-proof magnets and:	
(a) Mech KWH Register	16
(b) Mech Demand Registers	10
(c) Electronic Demand Register	16
(d) Mech Cam Pulse Initiator	2
(e) Mech Gear Shutter Pulse Initiator	8
(f) Electronic Pulse Initiator	12
(g) Electronic Remote Registers	8
(h) Electronic TOU Register	16
(6) Electronic Meter	16
For single phase and polyphase <i>transformer rated</i> meters:	
(7) Electronic Meters	
(a) Billing Constant 500 or less	12
(b) Billing Constant 500 - 10,000	8
(c) Billing Constant >10,000	4
(8) Electromechanical Watthour Meters with surge proof magnets	
(a) Billing Constant 500 or less	8
(b) Billing Constant >500	4

Test interval is based on the Billing Constant which equals the absolute CT ratio X VT ratio. (i.e. With a 40:1 CT and a 60:1 VT ratio, the Billing Constant is 2400)

b. Statistical Sampling Plan

The Statistical Sampling Plan used shall conform to accepted principles of statistical sampling based on either variables or attributes methods. Meters shall be divided into homogeneous groups, or lots. Meter lot composition will be based on manufacturer and model, assuming like design and construction, with individual lot population not to exceed 15,000 meters. For meter model populations of like design exceeding 15,000 units, multiple lots must be established, with meter age determining lot composition. For example, the first 15,000 meters purchased will comprise Lot #1, the second 15,000 meters purchased will comprise Lot #2, etc. This process will continue until the meter model population is exhausted. Utilities will have the option of using a smaller lot composition, as shown below:

Lot	Meter Type	Meter Population
1	J4S	7,882
2	I70S	10,000
3	I70S	9,130
4	D5S	4,535
5	MS	6,892
6	J5S	9,922
7	MX	8,325

The number of meters to be selected in a Sample Test Plan shall be based on the American National Standard ANSI/ASQC Z1.9-1993.

The performance of the meters will also be based on criteria within this standard.

The minimum quantity of meters pulled shall be based on Inspection Level II, AQL = 2.5, Table A-2 (see Attachment No. 1) and Table B-3 (see Attachment No. 2).

Lot performance shall be deemed acceptable if the full load performance of the meters within the lot meet the acceptability criteria of the ANSI/ASQC Z1.9-1993 based on an upper limit of 102% and a lower limit of 98% using Table B-3 (see Attachment No. 2).

The utility must replace or test all meters in a failed test group within 18 months of the annual report to the Commission. If, after testing 10% of the meters in a failed lot, the lot performance falls within acceptable ANSI Z1.9 parameters, the utility has the option to cease replacement/testing and apply the ANSI tightened inspection criteria for the next sampling period. Any future lot failure requires 100% replacement or testing within the subsequent 18 month period.

Removal of multiple failed meter lots could pose operational hardship. Utilities will propose an alternate removal plan upon the failure of multiple groups or when the number of meters in the affected groups exceeds 3.5% of the total meter population.

4. Test Records

The data to be recorded for the sample test plan shall include:

- (a) the number of meters in each group at the beginning of the test year
- (b) the number of meters tested
- (c) the analyzed test results

5. Determination of Billing Accuracy

The percentage registration of a watthour meter is, in general, different at light loads than at full loads, and may have still other values at other loads.

The determination of the average percentage registration of a watthour meter is not a simple matter, since it involves the characteristics of the meter and the loading. The accuracy of meters is more closely associated with the FL test accuracy for most loads since the LL accuracy is only representative of the meter's performance at a very small load conditions.

Average percentage registration is the weighted average of the percentage registration at light load (LL) and at full load (FL), giving the full load registration a weight of four:

$$\text{Weighted Percentage Registration} = \frac{4\text{FL} + \text{LL}}{5}$$

III. Mechanical and Thermal Demand Registers and Pulse Recorders

A. Accuracy Requirements

1. Acceptable Performance

The performance of a mechanical or lagged demand register shall be acceptable when the error in demand registration does not exceed ± 4

percent in terms of full-scale value when tested at any point between 50% and 100% of full-scale.

Under usual operating conditions, the performance of a pulse recording device shall be acceptable when the kilowatthours calculated from the pulse count do not differ by more than 2% from the corresponding kilowatthour meter registration.

2. Test Points

Mechanical or lagged demand registers should be tested at load Points or at above 50% of full scale.

3. Adjustment Limits

When a test of a mechanical or lagged demand register indicates that the error in registration exceeds that specified in paragraph A(1) in this section, the demand register shall be adjusted to within $\pm 2\%$ of full-scale value.

B. Instrument Transformers (Magnetic)

1. Pre-installation Tests

Prior to installation, all new instrument transformers shall be tested for voltage withstand, ratio correction factor, and phase angle. The tests shall be performed in accordance with the criteria established in IEEE C57.13.

2. Instrument Transformers Removed from Service

Instrument transformers removed from service will continue to be tested before retirement or return to service.

APPENDIX B

INTER COUNTY ENERGY COOPERATIVE

Inter County Energy Figure 1

GROUP	MANUFACTURER	TYPE	TOTAL	SAMPLE SIZE
1	General Electric	I60	1070	30
2	General Electric	I70	1899	38
3	General Electric	I55, I55S, I50, I50S	368	30
4	Sangamo	J3S	856	30
5	Sangamo	J4S	5027	101
6	Sangamo	J5S	6886	138
7	Westinghouse	D4S	1902	38
8	Westinghouse	D5S	1015	21
9	ABB	AB1	1345	31
10	Duncan	MX	192	30
		TOTAL	20560	487

NOTES

- 1). Initially, the sample size is 2% of the total population (min of 30).
- 2). The chart above is based on 1997 data used in initial application to PSC.
- 3). The total number of meters on the system include those meters in transition to and from the meter test shop.

APPENDIX C

**KENTUCKY POWER COMPANY
D/B/A
AMERICAN ELECTRIC POWER**

Kentucky Power's Sample Test Groups

Group Name	Meter Types (approximate)	Installed Meters	Sample Qty.	Comments
I70S1	I70S Series	10,000	75	74,000 Total I70S series currently
I70S2	Oldest	10,000	75	
I70S3	to	10,000	75	
I70S4	Newest	10,000	75	
I70S5		10,000	75	
I70S6		10,000	75	
I70S7		13,700	100	Newest
MS1	MS Series	10,000	75	31,300 Total MS series currently
MS2	Oldest to	10,000	75	
MS3	Newest	11,400	100	
J5S	J5S Series	14,500	100	
J4S	J4S	15,635	100	Slightly over 15,000
D4S1	D4S Oldest	5,000	75	
D4S2	D4S Newest	10,000	75	
D5S1	D5S	4,000	75	Less than 77.5M
D5S2	D5S	1,250	50	Greater than 77.5M (known mfgr.change s/n)
I60S	I60S series	2,420	50	
I55S	I55S series	1,438	50	
I50S	I50S series	588	35	
J3S	J3S Series	962	35	
MQS	MQS	267	15	
MX	MX series	2,789	50	
Total			1510	

APPENDIX D

KENTUCKY UTILITIES COMPANY

Sample Test Groups for Kentucky Utilities Company

Group Name	Meter Type	In Service Population	Sample Quantity
I50	GE I50	4,228	75
I55	GE I55	3,963	75
I60-1	GE I60	10,000	75
I60-2	GE I60	10,000	75
I60-3	GE I60	10,000	75
I60-4	GE I60	10,000	75
I60-5	GE I60	1,476	50
I70-1	GE I70	10,000	75
I70-2	GE I70	10,000	75
I70-3	GE I70	10,000	75
I70-5	GE I70	10,000	75
I70-6	GE I70	10,000	75
I70-7	GE I70	10,000	75
I70-8	GE I70	10,000	75
I70-9	GE I70	10,000	75
I70-10	GE I70	10,000	75
I70-11	GE I70	10,000	75
I70-12	GE I70	10,000	75
I70-13	GE I70	10,000	75
I70-14	GE I70	10,000	75
I70-15	GE I70	1,350	50
V612	GE V612	887	35
V62	GE V62	383	20
DS	Westinghouse DS	712	35
D2	Westinghouse D2	1,041	35
D3	Westinghouse D3	3,654	75
D4-1	Westinghouse D4	10,000	75
D4-2	Westinghouse D4	10,000	75
D4-3	Westinghouse D4	10,000	75
D4-4	Westinghouse D4	10,000	75
D4-5	Westinghouse D4	3,279	75
D5	Westinghouse D5	4,515	75
TD	Westinghouse TD	1,218	50
AB1-1	ABB AB1	10,000	75
AB1-2	ABB AB1	3,450	75
JM	Sangamo JM	1,259	50
J2	Sangamo J2	2,188	50
J3-1	Sangamo J3	10,000	75
J3-2	Sangamo J3	5,399	75

J4-1	Sangamo J4	10,000	75
J4-2	Sangamo J4	10,000	75
J4-3	Sangamo J4	10,171	100
J5-1	Schlumberger J5	10,000	75
J5-2	Schlumberger J5	10,000	75
J5-3	Schlumberger J5	10,000	75
J5-4	Schlumberger J5	10,000	75
J5-5	Schlumberger J5	10,000	75
J5-6	Schlumberger J5	10,000	75
J5-7	Schlumberger J5	10,000	75
J5-8	Schlumberger J5	10,000	75
J5-9	Schlumberger J5	10,000	75
J5-10	Schlumberger J5	4,020	75
S12S	Schlumberger S12	96	10
MF	Duncan MF	1,398	50
MK	Duncan MK	1,513	50
MQS	Duncan MQS	7,052	75
MS-1	Duncan MS	10,000	75
MS-2	Duncan MS	10,000	75
MS-3	Duncan MS	10,000	75
MS-4	Duncan MS	10,000	75
MS-5	Duncan MS	8,791	75
MSII	Landis & Gyr MSII	5,077	75
MX-1	Landis & Gyr MX	10,000	75
MX-2	Landis & Gyr MX	2,712	50
DXMS	Landis & Gyr DXMS	258	15
DXMX	Landis & Gyr DXMX	137	10

APPENDIX E

LOUISVILLE GAS & ELECTRIC COMPANY

Sample Test Groups for Louisville Gas and Electric Company

Group Name	Meter Type	In-service Population	Sample Quantity
I50	GE I50	2,859	50
I55	GE I55	3,000	50
DS	Westinghouse DS	1,337	50
J2	Sangamo J2	1,881	50
I60-2	GE I60	10,000	75
I60-2	GE I60	7,877	75
D2S	Westinghouse D2S	2,367	50
J3	Sangamo J3	6,624	75
MQS	Duncan MQS	1,024	35
D4-1	Westinghouse D4	10,000	75
D4-2	Westinghouse D4	9,373	75
J4-1	Sangamo J4	10,000	75
J4-2	Sangamo J4	3,852	75
MS	Duncan MS	9,849	75
I70-1	GE I70	10,000	75
I70-2	GE I70	10,000	75
I70-3	GE I70	10,000	75
I70-4	GE I70	10,000	75
I70-5	GE I70	10,000	75
I70-6	GE I70	10,000	75
I70-7	GE I70	10,000	75
I70-8	GE I70	10,000	75
I70-9	GE I70	10,000	75

I70-10	GE I70	10,000	75
I70-11	GE I70	2,326	50
D5	Westinghouse D5	7,084	75
MSII-1	Landis & Gyr MSII	10,000	75
MSII-2	Landis & Gyr MSII	10,000	75
MSII-3	Landis & Gyr MSII	10,000	75
MSII-4	Landis & Gyr MSII	10,000	75
MSII-5	Landis & Gyr MSII	10,000	75
MSII-6	Landis & Gyr MSII	3,574	75
MX-1	Landis & Gyr MX	10,000	75
MX-2	Landis & Gyr MX	6,422	75
AB1	ABB AB1	287	20
J4ES	Schlumberger J4ES	343	20
J5-1	Schlumberger J5	10,000	75
J5-2	Schlumberger J5	10,000	75
J5-3	Schlumberger J5	10,000	75
J5-4	Schlumberger J5	10,000	75
J5-5	Schlumberger J5	10,000	75
J5-6	Schlumberger J5	10,000	75
J5-7	Schlumberger J5	10,000	75
J5-8	Schlumberger J5	2,931	50
C1S	Schlumberger C1S	22	4

APPENDIX F

OWEN ELECTRIC COOPERATIVE

Owen Electric

Single Phase Electric Meters Grouped by Age and Manufacturer

Manufacturer	Total No. of Active meters	Number Tested
Sangamo-old	1767	93
Sangamo-new	17,833	793
Westinghouse-old	1,503	74
Westinghouse-new	1,080	51
GE - old	704	35
GE - new	9,814	504
Landis & Gyr	5,099	241
ABB	1,809	93
<hr/>		
Total	39,609	1,884

Notes:

Old = meters older than 25 years

New = meters less than 25 years

APPENDIX G

SHELBY ENERGY COOPERATIVE

SHELBY ENERGY
COOPERATIVE

Appendix G

SHELBY ENERGY COOPERATIVE

SINGLE PHASE ELECTRIC METERS GROUPED BY AGE AND MANUFACTURER

<u>SAMPLE GROUP</u>	<u>MANUFACTURER</u>	<u>TYPE</u>	<u>SERIAL NUMBER</u>	<u># METERS IN GROUP</u>
1	ABB/WESTINGHOUSE	D4S	< 72 000 000	1343
2	ABB/ WESTINGHOUS	D5S	> 72 000 000	1010
3	DUNCAN/LANDIS & GYR		< 30 000 000	744
4	DUNCAN/LANDIS & GYR		> 30 000 000	1430
5	GENERAL ELECTRIC		ALL	1951
6	SANGAMO/SCHLUMBERGER	J4S	< 69 000 000	4279
7	SANGAMO/SCHLUMBERGER	J5S	> 69 000 000	1883

APPENDIX H

UNION LIGHT HEAT & POWER COMPANY

ULH&P Proposed Sample Test Groups

Group Name	Meter Types	Installed	Sample Quantity
I70S1	I70S series Oldest	Approx. 8,000	75
I70S2	I70S series Newest	Approx. 8,000	75
MS1	MS series Oldest	Approx. 9,000	75
MS2	MS series Newest	Approx. 9,000	75
J5S1	J5S series Oldest	Approx. 10,000	75
J5S2	J5S series Newest	Approx. 4,000	75
J4S1	J4S series Oldest	Approx. 6,000	75
J4S2	J4S series Newest	Approx. 6,000	75
D3S	D2S/D3S	6850	75
D4S1	D4S series Oldest	8,000	75
D4S2	D4S series Newest	8,000	75
D5S	D5S series	5,662	75
I60	I60/I55/I50	7,875	75
J3S	J3S	5,150	75
MQS	MQS/MKS	7,675	75
S12S	S2S series	400	20
V612S	V612S series	525	35
Total		100,812	1180

REDLINED VERSION

KENTUCKY PUBLIC SERVICE COMMISSION

JOINT AMENDED APPLICATION ON BEHALF OF

Inter County Energy Cooperative Corporation

Kentucky Power Company d/b/a American Electric Power

Kentucky Utilities Company

Louisville Gas and Electric Company

Owen Electric Cooperative, Inc.

Shelby Energy Cooperative, Inc.

The Union Light, Heat and Power Company

PILOT METER TESTING PLAN

COMMONWEALTH OF KENTUCKY
BEFORE THE PUBLIC SERVICE COMMISSION

In the Matter of: Case No. 99-441

THE JOINT AMENDED APPLICATION OF THE UTILITIES:)
INTER COUNTY ENERGY COOPERATIVE CORP.,)
KENTUCKY POWER COMPANY, d/b/a AMERICAN)
ELECTRIC POWER, KENTUCKY UTILITIES COMPANY,)
LOUISVILLE GAS AND ELECTRIC, OWEN ELECTRIC)
COOPERATIVE, SHELBY ENERGY COOPERATIVE,)
THE UNION LIGHT HEAT AND POWER COMPANY)
COLLECTIVELY CALLED ("UTILITIES") FOR APPROVAL)
OF A PILOT METER TESTING PLAN PURSUANT TO)
807 KAR 5:041, SECTIONS 13, 15, 16, 17 and 22)

JOINT AMENDED APPLICATION

The Joint Applicants, Inter County Energy Cooperative Corporation, Kentucky Power Company d/b/a American Electric Power, Kentucky Utilities Company, Louisville Gas and Electric, Owen Electric Cooperative Inc., Shelby Energy Cooperative Inc., The Union Light, Heat and Power Company, (collectively hereinafter called "Utilities"), move the Public Service Commission of Kentucky pursuant to 807 KAR 5:041, Sections 13, 15, 16, 17 and 22, to approve the amended ~~proposed~~ Pilot Meter Testing Plan filed herewith in lieu of the meter tests procedures prescribed by the Commission in its regulation 807 KAR 5:041, Sections 13, 15, 16, and 17, respectively. The Utilities also request the Commission to approve each utility's plan for implementation. The amended Pilot Meter Testing Plan will be in effect for a five year period beginning ~~January 1, 2000~~ July 1, 2000.

I. BACKGROUND

Meter accuracy regulations in Kentucky were developed many years ago and metering technology in the electric industry has changed significantly since the inception of these regulations. While the development of meter technology has resulted in improved meter accuracy and dependability, meter accuracy regulations have not been updated to be consistent with these technological advances. As a result, the Utilities believe that the institution of a pilot meter testing plan is appropriate at this time.

II. WHY USE A PILOT PROGRAM?

The Utilities recognize that the current regulations apply to all utilities, including gas, water and electric industries. Yet, the technological advances in electric metering exceed what has occurred in the gas and water industries. For example, metering technology advances in the electric industry have resulted in the use of electromechanical meters with magnetic suspensions and surge-proof magnets. Performance data indicate that meter accuracy is significantly improved compared to earlier generation ball/jewel bearing suspension meters.

The Pilot concept offers a method of evaluating whether the proposed deviation is beneficial to the Utilities and to their customers. The meter population will be sufficient to allow for a thorough and statistically reliable evaluation before a statewide rollout of revised regulations. Any required pilot program revision will be accomplished before the actual regulations change, so the Pilot offers additional flexibility for potential modifications.

III. DESCRIPTION OF PILOT METER TESTING PLAN

The Pilot program is based on American National Standard Code for Electricity Metering, ANSI C12.1-1995. The details of the amended Pilot Meter Testing Plan, as applicable to the Utilities, are attached in Appendix A. Identification of the utility-specific sample test groups, ~~as well as the anticipated cost savings of the pilot,~~ is provided in Appendices B through H. The Pilot plan establishes accuracy limits, test plans and inspection procedures for alternating-current revenue producing watthour meters. The purpose of the Pilot Plan is to enhance the ability to detect and remove, at the earliest possible date, any group of meters that does not meet prescribed performance standards.

The major components of the Pilot Meter Testing Plan are described below.

1. All new metering devices shall be 100% tested: Either by the manufacturer or by the utility.
2. Use of a statistical sampling plan that will allow the Utilities to target meters by narrowly defined "lots", resulting in a greater probability of detecting "bad meters". Meter lot composition will be based on manufacturer and model, assuming like design and construction, with individual lot population not to exceed 15,000 meters. The meter lot composition for each utility is shown in Appendices B through H.

3. The utility must replace or test all meters in a failed test group within 18 months of the annual report to the Commission. If, after testing 10% of the meters in a failed lot, the lot performance falls within acceptable ANSI Z1.9 parameters, the utility has the option to cease replacement/testing and apply the ANSI tightened inspection criteria for the next sampling period. Any future lot failure requires 100% replacement or testing within the subsequent 18 month period.

4. Elimination of the 25 Year Rule.

Currently the Utilities are required to test every single-phase meter within 25 years. Smoothing annual test volumes requires that utilities test 4% of the meter population each year. In practice, the 25-year rule creates a periodic override to a sample test plan. Establishment of narrow ANSI test groups along with the elimination of the 25-year rule will concentrate resources on improving the detection and replacing suspect metering equipment. Considerable resources are currently focused on testing large numbers of meters with outstanding historical performance. In general, adoption of an ANSI sample program will mean testing fewer meters out of more groups and result in an improved testing program at a lower cost.

5. Elimination of requirement to test meter after being removed.

Sample plans are based on the assumption that the selected sample accurately represents the parent population. A meter routinely removed from service for reasons other than sample testing or damage should perform no differently than

the sample group. Reinstallation of these meters at a new location without a test closely parallels the way customers routinely change residences without a meter test. In the absence of physical damage it is assumed that the meter is performing like its parent population.

6. Extension for time intervals for testing certain metering equipment including instrument transformer meters and demand meters. These meters have historically realized high levels of accuracy.

IV. BENEFITS OF THE PILOT METER TESTING PLAN

The benefits of the Pilot Plan include increasing meter accuracy and dependability, as well as the control of meter operating costs. Accuracy will be enhanced by the annual testing of a scientifically drawn sample of meter groups. Meter groups that demonstrate substandard performance will be identified and removed earlier than under the existing testing program. The Utilities estimate that these programs will save the companies and their customers on average \$1,000,000 per year by the end of the pilot period. Meter replacement cost could offset savings during the initial pilot years since revised meter groupings will quickly identify poor performing meters.

V. IMPLEMENTATION PLAN

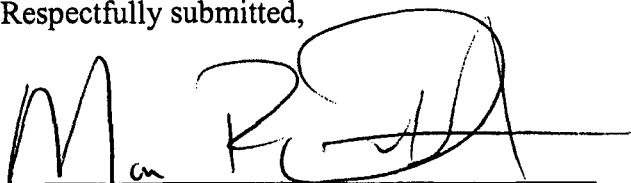
The Utilities propose that the Pilot Plan be implemented beginning ~~January 1, 2000~~ July 1, 2000. The Plan will remain in effect for five years. At the end of the fourth year, the Utilities will prepare an evaluation of the costs and benefits of the Pilot program and will submit a report

to the Commission by ~~July 1, 2004~~ January 1, 2005. At the end of each year, each utility will submit new sample test groups based on its then current meter population, if such changes are necessary.

VI. RECOMMENDATION

For reasons set forth above, the Utilities move the Commission to approve the Pilot Meter Testing Plan effective ~~January 1, 2000~~ July 1, 2000.

Respectfully submitted,

A handwritten signature in black ink, appearing to read 'Mark R. Overstreet', written over a horizontal line.

Mark R. Overstreet
STITES & HARBISON
421 West Main Street
P. O. Box 634
Frankfort, Kentucky 40602
Telephone: (502)223-3477
COUNSEL FOR JOINT APPLICANTS

APPENDIX A

METER TESTING PILOT PLAN

AMENDED METER TESTING PILOT PLAN

I. New Metering Device Tests

New metering devices shall be either 100% tested by the utility or 100% tested by the manufacturer.

II. Standards for In-Service Performance - Watthour Meters and Electronic Registers

A. Purpose

1. This section shall establish accuracy limits, test plans and inspection procedures for alternating-current revenue watthour meters.
2. Watthour meters placed into service or returned to service shall meet the provisions set forth in this Section test plan.
3. All watthour meters and their associated equipment shall be thoroughly inspected at the time of installation to assure safe and accurate operation.

B. Accuracy Requirements

1. Testing Equipment and Standards

- b. All working electronic watt-hour standards when regularly used shall be compared with a master standard every six months. Working watt-hour standards infrequently used shall be compared with a master standard before they are used.
- b. All working indicating instruments that affect the customer's quality of service shall be checked against master indicating instruments annually. If the working instrument is found appreciably in error at zero or in error by more than one (1) percent

of indication at commonly used scale deflections, it shall be adjusted. A calibration record shall be maintained for each instrument showing all pertinent data and name of person performing tests.

2. Test Loads

Full load shall be approximately 100% of test amperes at unity power factor, light load approximately 10% of test amperes at unity power factor and power factor 100% test amperes 50% lagging power factor. For meters used with current transformers, full load shall be approximately 100% of either meter test amperes or the secondary current rating of the current transformers; light load shall be approximately 10% of the selected full load current.

3. Acceptable Performance

The performance of all in-service watthour meters is considered to be acceptable when the percent registration is not less than 98% or more than 102% as determined in paragraph D(5) of this section.

4. Adjustment Limits

Watthour meters shall be adjusted when the error in registration exceeds 1% at either light load or full load or when the error in registrations exceeds 2% at power factor. The registration of the watthour meter shall be adjusted within these limits as close to 100% as practical.

5. Acceptable Performance for Electronic Registers

The performance of a watthour meter with an electronic register when tested for other than kilowatthour registration shall be acceptable when the error measured does not exceed $\pm 2\frac{0}{10}\%$ of reading.

C. Tests

1. As-found Tests

As-found tests are done to determine the watthour meter accuracy before recalibration.

2. As-left Tests

As-left tests shall be conducted after all adjustments are completed and are in accordance with paragraph B(3) in this section.

3. Meters Removed from Service

Meters identified within this test plan may be removed from service and retired without test. Meters identified within this test plan may be returned to service without being tested.

D. Performance Tests

1. General

The performance of watthour meters should be verified by an annual test program such as one of the plans listed below. Records shall be maintained on each watthour meter tested. Subsequently, an analysis of the test results for each group of watthour meters shall be made and appropriate action shall be taken. The plans for testing are:

- a. Periodic Interval Plan
- b. Statistical Sampling Plan

2. Objectives

The primary purpose of performance testing is to provide information on which the utility may base a program to maintain meters in an acceptable degree of accuracy throughout their service life.

3. Test Plans

The Periodic Interval Plan is a schedule of testing for watthour meters at various set intervals. The Statistical Sampling Plan provides for the division of watthour meters into homogeneous groups. The annual selection process is random where each watthour meter within each group has an equal chance of being selected.

a. Periodic Interval Plan

The selected periodic interval for testing a watthour meter depends on the size of the service, complexity of the metering system, reliability of the type of watthour meter and/or manufacturer's recommendations. The plan listed below is a detailed periodic testing schedule by watthour meter and attachments:

Periodic Testing Schedule

	<u>Years Between Testing</u>
(1) Graphic Watthour Demand	2
(2) Electromechanical Watthour Meters without surge-proof magnets	8
(3) Thermal Lagged Demand Meters	16
(4) Magnetic Tape Demand Records	12
(5) Electromechanical Watthour Meters with surge-proof magnets and:	
(a) Mech KWH Register	16
(b) Mech Demand Registers	10
(c) Electronic Demand Register	16
(d) Mech Cam Pulse Initiator	2
(e) Mech Gear Shutter Pulse Initiator	8
(f) Electronic Pulse Initiator	12
(g) Electronic Remote Registers	8
(h) Electronic TOU Register	16
(6) Electronic Meter	16
<u>For single phase and polyphase transformer rated meters:</u>	
(7) Electronic Meters	
(a) Billing Constant 500 or less	12
(b) Billing Constant 500 - 10,000	8
(c) Billing Constant >10,000	4
(8) Electromechanical Watthour Meters with surge proof magnets	
(a) Billing Constant 500 or less	8
(b) Billing Constant >500	4

Test interval is based on the Billing Constant which equals the absolute CT ratio X VT ratio. (i.e. With a 40:1 CT and a 60:1 VT ratio, the Billing Constant is 2400)

Periodic Testing Schedule

Years
Between Testing

For Non Transformer Rated Meters:

(1)	Graphic Watthour Demand	2
(2)	Electromechanical Watthour Meters without surge proof magnets	8
(3)	Thermal Lagged Demand Meters	16
(4)	Magnetic Tape Demand Records	12

For Singlephase and Polyphase *Self Contained* Services:

(5)	Electromechanical Watthour Meters with surge proof magnets and:	
	(a) Mech KWH Register	16
	(b) Mech Demand Registers	8 12
	(c) Electronic Demand Register	16
	(d) Mech Cam Pulse Initiator	2
	(e) Mech Gear Shutter Pulse Initiator	8
	(f) Electronic Pulse Initiator	12
	(g) Electronic Remote Registers	8
	(h) Electronic TOU Register	16
(6)	Electronic Meter	16

For Singlephase and Polyphase *Transformer Rated* Meters:

(7)	Electronic Meters	
	(a) Billing Constant 500 or less	12
	(b) Billing Constant 500 - 10,000	8
	(c) Billing Constant >10,000	

(8)	Electromechanical Watthour Meters with surge proof magnets:	
	(a) Billing Constant 500 or less	8
	(b) Billing Constant > 500	4

b. Statistical Sampling Plan

The Statistical Sampling Plan used shall conform to accepted principles of statistical sampling based on either variables or attributes methods. Meters shall be divided into homogeneous groups, or lots, such as ~~manufacturer and manufacturer's type~~. The groups may be further divided into ~~subdivision within the manufacturer's type by major design modifications~~. Meter lot composition will be based on manufacturer and model, assuming like design and construction, with individual lot population not to exceed 15,000 meters. For meter model populations of like design exceeding 15,000 units, multiple lots must be established, with meter age determining lot composition. For example, the first 15,000 meters purchased will comprise Lot #1, the second 15,000 meters purchased will comprise Lot #2, etc. This process will continue until the meter model population is exhausted. Utilities will have the option of using a smaller lot composition, as shown below. For example, the meters could be divided as follows:

Lot	Meter Type	Meter Population
<u>I1</u>	J4S	<u>25,6787,882</u>
<u>II2</u>	I70S	<u>22,56710,000</u>
<u>III3</u>	I70S	<u>9,130</u>
<u>IIII4</u>	D5S	<u>28,9084,535</u>
<u>V5</u>	MS	<u>29,7656,892</u>
<u>VI6</u>	J5S	<u>23,5689,922</u>
<u>VII7</u>	DXMX, MX	<u>24,9808,325</u>

The number of meters to be selected in a Sample Test Plan shall be based on the American National Standard ANSI/ASQC Z1.9-1993. The performance of the meters will also be based on criteria within this standard.

The minimum quantity of meters pulled shall be based on Inspection Level II, AQL = 2.5, Table A-2 (see Attachment No. 1) and Table B-3 (see Attachment No. 2).

Lot performance shall be deemed acceptable if the full load performance of the meters within the lot meet the acceptability criteria of the ANSI/ASQC Z1.9-1993 based on an upper limit of 102% and a lower limit of 98% using Table B-3 (see Attachment No. 2).

The utility must replace or test all meters in a failed test group within 18 months of the annual report to the Commission. If, after testing 10% of the meters in a failed lot, the lot performance falls within acceptable ANSI Z1.9 parameters, the utility has the option to cease replacement/testing and apply the ANSI tightened inspection criteria for the next sampling period. Any future lot failure requires 100% replacement or testing within the subsequent 18 month period.

Removal of multiple failed meter lots could pose operational hardship. Utilities will propose an alternate removal plan upon the

failure of multiple groups or when the number of meters in the affected groups exceeds 3.5% of the total meter population.

~~If a lot fails, the utility must reevaluate by establishing an additional lot in the next year's sample program that consists only of the meter type that caused the lot to fail. If that lot fails again, the Commission shall be notified of the Company's action to resolve the problem.~~

4. Test Records

The data to be recorded for the sample test plan shall include:

- (a) the number of meters in each group at the beginning of the test year
- (b) the number of meters tested
- (c) the analyzed test results

5. Determination of Billing Accuracy

The percentage registration of a watthour meter is, in general, different at light loads than at full loads, and may have still other values at other loads. The determination of the average percentage registration of a watthour meter is not a simple matter, since it involves the characteristics of the meter and the loading. The accuracy of meters is more closely associated with the FL test accuracy for most loads since the LL accuracy is only representative of the meter's performance at a very small load conditions.

Average percentage registration is the weighted average of the percentage registration at light load (LL) and at full load (FL), giving the full load registration a weight of four:

$$\text{Weighted Percentage Registration} = \frac{4\text{FL} + \text{LL}}{5}$$

III. Mechanical and Thermal Demand Registers and Pulse Recorders

A. Accuracy Requirements

1. Acceptable Performance

The performance of a mechanical or lagged demand register shall be acceptable when the error in demand registration does not exceed ± 4 percent in terms of full-scale value when tested at any point between 50% and 100% of full-scale.

Under usual operating conditions, the performance of a pulse recording device shall be acceptable when the kilowatthours calculated from the pulse count do not differ by more than 2% from the corresponding kilowatthour meter registration.

2. Test Points

Mechanical or lagged demand registers should be tested at load Points or at above 50% of full scale.

3. Adjustment Limits

When a test of a mechanical or lagged demand register indicates that the error in registration exceeds that specified in paragraph A(1) in this section, the demand register shall be adjusted to within $\pm 2\%$ of full-scale value.

B. Instrument Transformers (Magnetic)

1. Pre-installation Tests

Prior to installation, all new instrument transformers shall be tested for voltage withstand, ratio correction factor, and phase angle. The tests shall be performed in accordance with the criteria established in IEEE C57.13.

2. Instrument Transformers Removed from Service

Instrument transformers removed from service will continue to be tested before retirement or return to service ~~can be retired or returned to service without further testing.~~

APPENDIX B

INTER COUNTY ENERGY COOPERATIVE

Inter County Energy Figure 1

GROUP	MANUFACTURER	TYPE	TOTAL	SAMPLE SIZE
1	General Electric	I60	1070	30
2	General Electric	I70	1899	38
3	General Electric	I55, I55S, I50, I50S	368	30
4	Sangamo	J3S	856	30
5	Sangamo	J4S	5027	101
6	Sangamo	J5S	6886	138
7	Westinghouse	D4S	1902	38
8	Westinghouse	D5S	1015	21
9	ABB	AB1	1345	31
10	Duncan	MX	192	30
TOTAL			20560	487

NOTES

- 1). Initially, the sample size is 2% of the total population (min of 30).
- 2). The chart above is based on 1997 data used in initial application to PSC.
- 3). The total number of meters on the system include those meters in transition to and from the meter test shop.

APPENDIX C

**KENTUCKY POWER COMPANY
D/B/A
AMERICAN ELECTRIC POWER**

Kentucky Power's Sample Test Groups

Group Name	Meter Types (approximate)	Installed Meters	Sample Qnty.	Comments
I70S1	I70S Series	10,000	75	74,000 Total I70S series currently
I70S2	Oldest	10,000	75	
I70S3	to	10,000	75	
I70S4	Newest	10,000	75	
I70S5		10,000	75	
I70S6		10,000	75	
I70S7		13,700	100	
MS1	MS Series	10,000	75	31,300 Total MS series currently
MS2	Oldest to	10,000	75	
MS3	Newest	11,400	100	
J5S	J5S Series	14,500	100	
J4S	J4S	15,635	100	Slightly over 15,000
D4S1	D4S Oldest	5,000	75	
D4S2	D4S Newest	10,000	75	
D5S1	D5S	4,000	75	Less than 77.5M
D5S2	D5S	1,250	50	Greater than 77.5M (known mfr change s/n)
I60S	I60S series	2,420	50	
I55S	I55S series	1,438	50	
I50S	I50S series	588	35	
J3S	J3S Series	962	35	
MQS	MQS	267	15	
MX	MX series	2,789	50	
Total			1510	

APPENDIX D

KENTUCKY UTILITIES COMPANY

Sample Test Groups for Kentucky Utilities Company

Group Name	Meter Type	In Service Population	Sample Quantity
I50	GE I50	4,228	75
I55	GE I55	3,963	75
I60-1	GE I60	10,000	75
I60-2	GE I60	10,000	75
I60-3	GE I60	10,000	75
I60-4	GE I60	10,000	75
I60-5	GE I60	1,476	50
I70-1	GE I70	10,000	75
I70-2	GE I70	10,000	75
I70-3	GE I70	10,000	75
I70-5	GE I70	10,000	75
I70-6	GE I70	10,000	75
I70-7	GE I70	10,000	75
I70-8	GE I70	10,000	75
I70-9	GE I70	10,000	75
I70-10	GE I70	10,000	75
I70-11	GE I70	10,000	75
I70-12	GE I70	10,000	75
I70-13	GE I70	10,000	75
I70-14	GE I70	10,000	75
I70-15	GE I70	1,350	50
V612	GE V612	887	35
V62	GE V62	383	20
DS	Westinghouse DS	712	35
D2	Westinghouse D2	1,041	35
D3	Westinghouse D3	3,654	75
D4-1	Westinghouse D4	10,000	75
D4-2	Westinghouse D4	10,000	75
D4-3	Westinghouse D4	10,000	75
D4-4	Westinghouse D4	10,000	75
D4-5	Westinghouse D4	3,279	75
D5	Westinghouse D5	4,515	75
TD	Westinghouse TD	1,218	50
AB1-1	ABB AB1	10,000	75
AB1-2	ABB AB1	3,450	75
JM	Sangamo JM	1,259	50
J2	Sangamo J2	2,188	50
J3-1	Sangamo J3	10,000	75
J3-2	Sangamo J3	5,399	75

J4-1	Sangamo J4	10,000	75
J4-2	Sangamo J4	10,000	75
J4-3	Sangamo J4	10,171	100
J5-1	Schlumberger J5	10,000	75
J5-2	Schlumberger J5	10,000	75
J5-3	Schlumberger J5	10,000	75
J5-4	Schlumberger J5	10,000	75
J5-5	Schlumberger J5	10,000	75
J5-6	Schlumberger J5	10,000	75
J5-7	Schlumberger J5	10,000	75
J5-8	Schlumberger J5	10,000	75
J5-9	Schlumberger J5	10,000	75
J5-10	Schlumberger J5	4,020	75
S12S	Schlumberger S12	96	10
MF	Duncan MF	1,398	50
MK	Duncan MK	1,513	50
MQS	Duncan MQS	7,052	75
MS-1	Duncan MS	10,000	75
MS-2	Duncan MS	10,000	75
MS-3	Duncan MS	10,000	75
MS-4	Duncan MS	10,000	75
MS-5	Duncan MS	8,791	75
MSII	Landis & Gyr MSII	5,077	75
MX-1	Landis & Gyr MX	10,000	75
MX-2	Landis & Gyr MX	2,712	50
DXMS	Landis & Gyr DXMS	258	15
DXMX	Landis & Gyr DXMX	137	10

APPENDIX E

LOUISVILLE GAS & ELECTRIC COMPANY

Sample Test Groups for Louisville Gas and Electric Company

Group Name	Meter Type	In-service Population	Sample Quantity
I50	GE I50	2,859	50
I55	GE I55	3,000	50
DS	Westinghouse DS	1,337	50
J2	Sangamo J2	1,881	50
I60-2	GE I60	10,000	75
I60-2	GE I60	7,877	75
D2S	Westinghouse D2S	2,367	50
J3	Sangamo J3	6,624	75
MQS	Duncan MQS	1,024	35
D4-1	Westinghouse D4	10,000	75
D4-2	Westinghouse D4	9,373	75
J4-1	Sangamo J4	10,000	75
J4-2	Sangamo J4	3,852	75
MS	Duncan MS	9,849	75
I70-1	GE I70	10,000	75
I70-2	GE I70	10,000	75
I70-3	GE I70	10,000	75
I70-4	GE I70	10,000	75
I70-5	GE I70	10,000	75
I70-6	GE I70	10,000	75
I70-7	GE I70	10,000	75
I70-8	GE I70	10,000	75
I70-9	GE I70	10,000	75

I70-10	GE I70	10,000	75
I70-11	GE I70	2,326	50
D5	Westinghouse D5	7,084	75
MSII-1	Landis & Gyr MSII	10,000	75
MSII-2	Landis & Gyr MSII	10,000	75
MSII-3	Landis & Gyr MSII	10,000	75
MSII-4	Landis & Gyr MSII	10,000	75
MSII-5	Landis & Gyr MSII	10,000	75
MSII-6	Landis & Gyr MSII	3,574	75
MX-1	Landis & Gyr MX	10,000	75
MX-2	Landis & Gyr MX	6,422	75
AB1	ABB AB1	287	20
J4ES	Schlumberger J4ES	343	20
J5-1	Schlumberger J5	10,000	75
J5-2	Schlumberger J5	10,000	75
J5-3	Schlumberger J5	10,000	75
J5-4	Schlumberger J5	10,000	75
J5-5	Schlumberger J5	10,000	75
J5-6	Schlumberger J5	10,000	75
J5-7	Schlumberger J5	10,000	75
J5-8	Schlumberger J5	2,931	50
C1S	Schlumberger C1S	22	4

APPENDIX F

OWEN ELECTRIC COOPERATIVE

Owen Electric

Single Phase Electric Meters Grouped by Age and Manufacturer

Manufacturer	Total No. of Active meters	Number Tested
Sangamo-old	1767	93
Sangamo-new	17,833	793
Westinghouse-old	1,503	74
Westinghouse-new	1,080	51
GE - old	704	35
GE - new	9,814	504
Landis & Gyr	5,099	241
ABB	1,809	93
	-----	-----
Total	39,609	1,884

Notes:

Old = meters older than 25 years

New = meters less than 25 years

APPENDIX G

SHELBY ENERGY COOPERATIVE

SHELBY ENERGY COOPERATIVE

SINGLE PHASE ELECTRIC METERS GROUPED BY AGE AND MANUFACTURER

SAMPLE GROUP	MANUFACTURER	TYPE	SERIAL NUMBER	# METERS IN GROUP
1	ABB/WESTINGHOUSE	D4S	< 72 000 000	1343
2	ABB/ WESTINGHOUS	D5S	> 72 000 000	1010
3	DUNCAN/LANDIS & GYR		< 30 000 000	744
4	DUNCAN/LANDIS & GYR		> 30 000 000	1430
5	GENERAL ELECTRIC		ALL	1951
6	SANGAMO/SCHLUMBERGER	J4S	< 69 000 000	4279
7	SANGAMO/SCHLUMBERGER	J5S	> 69 000 000	1883

APPENDIX H

UNION LIGHT HEAT & POWER COMPANY

ULH&P Proposed Sample Test Groups

Group Name	Meter Types	Installed	Sample Quantity
I70S1	I70S series Oldest	Approx. 8,000	75
I70S2	I70S series Newest	Approx. 8,000	75
MS1	MS series Oldest	Approx. 9,000	75
MS2	MS series Newest	Approx. 9,000	75
J5S1	J5S series Oldest	Approx. 10,000	75
J5S2	J5S series Newest	Approx. 4,000	75
J4S1	J4S series Oldest	Approx. 6,000	75
J4S2	J4S series Newest	Approx. 6,000	75
D3S	D2S/D3S	6850	75
D4S1	D4S series Oldest	8,000	75
D4S2	D4S series Newest	8,000	75
D5S	D5S series	5,662	75
I60	I60/I55/I50	7,875	75
J3S	J3S	5,150	75
MQS	MQS/MKS	7,675	75
S12S	S2S series	400	20
V612S	V612S series	525	35
Total		100,812	1180

JOINT RESPONSE OF THE UTILITIES:
INTER COUNTY ENERGY COOPERATIVE,
KENTUCKY POWER COMPANY, KENTUCKY UTILITIES COMPANY,
LOUISVILLE GAS & ELECTRIC, OWEN ELECTRIC COOPERATIVE,
SHELBY ENERGY COOPERATIVE,
UNION LIGHT, HEAT & POWER COMPANY

REQUEST:

Please refer to the Commission's Data Request dated December 29, 1999, Item No. 1.

- (a) (807KAR5:006, Section 16 (4,5,6). The Utilities stated that they will continue to employ certified meter testers, but this requirement should not apply to a manufacturer. Staff raised question of how can the PSC be assured that the manufacturer employees who will be performing the test are qualified. Please provide the meter manufacturer's requirements/qualifications for meter testers.
- (b) 807KAR5:041(2). If the Commission requires a test of one of the manufacturer's KWH transfer standards, will the manufacturer make the standard available for the Commission to test?

RESPONSE:

- (a) Schlumberger and General Electric's qualification test specifications and quality assurance guidelines have been filed with the Commission under separate cover pursuant to 807 KAR 5:001, Section 7 in connection with the parties' Petition for Confidential Treatment. These manufacturers produce the majority of the meters currently purchased by utilities in Kentucky. ISO 9000 series certification encompasses the entire production and testing process, including test equipment calibration and operation. Both Schlumberger and General Electric are ISO 9000 certified.
- (b) Manufacturers have assured the utilities that they will cooperate in providing transfer standards and/or data as required by the Commission.

JOINT RESPONSE OF THE UTILITIES:
INTER COUNTY ENERGY COOPERATIVE,
KENTUCKY POWER COMPANY, KENTUCKY UTILITIES COMPANY,
LOUISVILLE GAS & ELECTRIC, OWEN ELECTRIC COOPERATIVE,
SHELBY ENERGY COOPERATIVE,
UNION LIGHT, HEAT & POWER COMPANY

REQUEST:

Please refer to Commission data requests dated December 29, 1999, Item No. 3. Please provide copies of other states' acceptability of criteria based on the AQL 2.5.

RESPONSE:

Please see the attached sheets for the state of Indiana. In addition, West Virginia, Texas, Ohio, and Virginia rules all follow the ANSI C12.1 guidelines for sample testing meters and the ANSI Z1.9-1993 AQL of 2.5 is used.

Indiana

170 IAC 4-1-10 In-service tests; watthour meters, self-contained

Authority: IC 8-1-1-3; IC 8-1-2-4

Affected: IC 8-1-2-35

Sec. 10. (a) A utility may adopt either Method A as described in subsection (b) or Method B as described in subsection (c) for maintaining the accuracy of self-contained meters without attachments or with frictionless attachments.

(b) For Method A, periodic testing of watthour meters, each public utility shall, after the adoption of this rule, use not more than a sixteen (16) year schedule of periodic testing.

(c) For Method B, quality control testing of watthour meters, a public utility may adopt the following quality control testing method for self-contained watthour meters, in service, on written notice to the commission:

(1) Meters shall be divided into homogenous groups.

(2) The meters in each group may be further subdivided into lots; however, no lot size shall be less than three hundred one (301) meters.

(3) From each lot there shall be drawn annually a number of meters to be tested as specified in Table A-2, ANSI/ASQC Standard Z1.9, dated 1993, using Inspection Level II. Due care shall be exercised that the meters to be tested shall be drawn at random, and all such meters shall be tested for accuracy.

(4) The test criterion for acceptance or rejection of each lot shall be based on the test at full load only and shall be that designated for Double Specification Limit) Variability Unknown) Standard Deviation Method at the 2.50 Acceptable Quality Level (normal inspection) as shown in Table B-3, ANSI/ASQC Standard Z1.9, dated 1993.

(5) The necessary calculations shall be made in accordance with the illustration (Example B-3), ANSI/ASQC Standard Z1.9, dated 1993. The upper and lower accuracy specification limits, U and L, shall be one hundred two percent (102%) and ninety-eight percent (98%), respectively.

(6) A lot shall be rejected if the total estimated percent defective (p) exceeds the appropriate maximum allowable percent defective (m) as determined from Table B-3, ANSI/ASQC Standard Z1.9, dated 1993.

(7) Meters in a rejected lot shall be subject to an accelerated test schedule to be completed within a maximum period of ninety-six (96) months and shall comply with section 9 of this rule, or shall be retired from service. Such accelerated testing of a rejected lot may be discontinued when the subsequent test results show that the lot is within acceptable limits of accuracy.

(8) A public utility, operating under this optional testing plan, may elect to test the meters included in any group or lot on a test schedule of not more than sixteen (16) years subject to section 9 of this rule.

(9) Each public utility shall keep all necessary records to enable the commission to check procedures followed, tests made, and calibrations employed in conformance with this optional testing method.

(10) All provisions of the aforesaid ANSI/ASQC Standard Z1.9, dated 1993, explanatory of or essential to the application of Table A-2, Table B-3, and Example B-3, as referenced in subdivisions (3) through (5), are hereby incorporated in this rule by reference.

(d) Requirements for other watthour meters are as follows:

(1) Electromechanical watthour meters with surge proof magnets and the following:

- (A) Mechanical KWH registers shall be tested at least every sixteen (16) years.
- (B) Mechanical demand registers shall be tested at least every eight (8) years.
- (C) Electronic demand registers shall be tested at least every sixteen (16) years.
- (D) Mechanical cam pulse initiators shall be tested at least every two (2) years.
- (E) Mechanical gear shutter pulse initiators shall be tested at least every eight (8) years.
- (F) Electronic pulse initiators shall be tested at least every twelve (12) years.
- (G) Electronic registers, for example, TOU or recorder, shall be tested at least every sixteen (16) years.
- (H) Thermal demand registers shall be tested at least every eight (8) years.

(2) Electronic meters shall be tested at least every sixteen (16) years.

(Indiana Utility Regulatory Commission; No. 33629: Standards of Service For Electrical Utilities Rule 10; filed Mar 10, 1976, 9:10 a.m.: Rules and Regs. 1977, p. 342; filed Feb 23, 1998, 11:30 a.m.: 21 IR 2324)

JOINT RESPONSE OF THE UTILITIES:
INTER COUNTY ENERGY COOPERATIVE,
KENTUCKY POWER COMPANY, KENTUCKY UTILITIES COMPANY,
LOUISVILLE GAS & ELECTRIC, OWEN ELECTRIC COOPERATIVE,
SHELBY ENERGY COOPERATIVE,
UNION LIGHT, HEAT & POWER COMPANY

REQUEST:

Please refer to the Commission's data requests dated December 29, 1999, Item No. 4 and Item No. 15. Staff indicated that the Utilities' proposals show that some "lot sizes" are very large. Utilities are requested to revise their meter lot size. Please describe the criteria that will be followed if a lot should fail. Utilities are requested to file an early removal plan for the meter groups that fail the test and the time frame for removing the failing lot.

RESPONSE:

Meter lot composition will be based on manufacturer and model, assuming like design and construction, with individual lot population not to exceed 15,000 meters. For meter model populations of like design exceeding 15,000 units, multiple lots must be established, with meter age determining lot composition. For example, the first 15,000 meters purchased will comprise Lot #1, the second 15,000 meters purchased will comprise Lot #2, etc. This process will continue until the meter model population is exhausted. Individual utilities have the option of establishing individual lot populations of less than 15,000 meters, as shown in the Amended Application.

The utility must replace or test all meters in a failed test group within 18 months of the annual report to the Commission. If, after testing 10% of the meters in a failed lot, the lot performance falls within acceptable ANSI Z1.9 parameters, the utility has the option to cease replacement/testing and apply the ANSI tightened inspection criteria for the next sampling period. Any future lot failure requires 100% replacement or testing within the subsequent 18 month period.

Removal of multiple failed meter lots could pose operational hardship. Utilities will propose an alternate removal plan upon the failure of multiple groups or when the number of meters in the affected groups exceeds 3.5% of the total meter population.

JOINT RESPONSE OF THE UTILITIES:
INTER COUNTY ENERGY COOPERATIVE,
KENTUCKY POWER COMPANY, KENTUCKY UTILITIES COMPANY,
LOUISVILLE GAS & ELECTRIC, OWEN ELECTRIC COOPERATIVE,
SHELBY ENERGY COOPERATIVE,
UNION LIGHT, HEAT & POWER COMPANY

REQUEST:

Please refer to Commission's data request dated December 29, 1999, Item No. 4. Utilities are requested to provide a Sample Report form to be used to annually file information to the Commission.

RESPONSE:

Please see attached sheet.

EXAMPLE B-3
Example of Calculations
Double Specification Limit
Variability Unknown—Standard Deviation Method
One AQL Value for Both Upper and Lower Specification Limit Combined

Example: The minimum temperature of operation for a certain device is specified as 180°F. The maximum temperature is 209°F. A lot of 40 items is submitted for inspection. Inspection Level II, normal inspection, with AQL = 1% is to be used. From Tables A-2 and B-3 it is seen that a sample of size 5 is required. Suppose the measurements obtained are as follows: 197°, 188°, 184°, 205°, and 201°; and compliance with the acceptability criterion is to be determined.

Line	Information Needed	Value Obtained	Explanation
1	Sample Size: n	5	
2	Sum of Measurements: ΣX	975	
3	Sum of Squared Measurements: ΣX^2	190,435	
4	Correction Factor (CF): $(\Sigma X)^2/n$	190,125	$(975)^2/5$
5	Corrected Sum of Squares (SS): $\Sigma X^2 - CF$	310	$190,435 - 190,125$
6	Variance (V): $SS/(n - 1)$	77.5	$310/4$
7	Estimate of Lot Standard Deviation s: \sqrt{V}	8.81	$\sqrt{77.5}$
8	Sample Mean \bar{X} : $\Sigma X/n$	195	$975/5$
9	Upper Specification Limit: U	209	
10	Lower Specification Limit: L	180	
11	Quality Index: $Q_U = (U - \bar{X})/s$	1.59	$(209 - 195)/8.81$
12	Quality Index: $Q_L = (\bar{X} - L)/s$	1.70	$(195 - 180)/8.81$
13	Est. of Lot Percent Ncf. above U: p_U	2.19%	See Table B-5
14	Est. of Lot Percent Ncf. below L: p_L	.66%	See Table B-5
15	Total Est. Percent Ncf. in Lot: $p = p_U + p_L$	2.85%	$2.19\% + .66\%$
16	Max. Allowable Percent Ncf.: M	3.32%	See Table B-3
17	Acceptability Criterion: Compare $p = p_U + p_L$ with M	$2.85\% < 3.32\%$	See Para. B12.1.2(7)

The lot meets the acceptability criterion, since $p = p_U + p_L$ is less than M.

JOINT RESPONSE OF THE UTILITIES:
INTER COUNTY ENERGY COOPERATIVE,
KENTUCKY POWER COMPANY, KENTUCKY UTILITIES COMPANY,
LOUISVILLE GAS & ELECTRIC, OWEN ELECTRIC COOPERATIVE,
SHELBY ENERGY COOPERATIVE,
UNION LIGHT, HEAT & POWER COMPANY

REQUEST:

Utilities are requested to revise the table in the Pilot Meter Testing Plan Application, Appendix A, page 5 filed October 29, 1999 in this case.

RESPONSE:

The Periodic Testing Schedule originally submitted in the utilities Application, Appendix A, page 5 is modified in the Amended Application and shown in the attached schedule.

Periodic Testing Schedule

Year Between Testing

(1)	Graphic Watthour Demand	2
(2)	Electromechanical Watthour Meters without surge-proof magnets	8
(3)	Thermal Lagged Demand Meters	16
(4)	Magnetic Tape Demand Records	12
(5)	Electromechanical Watthour Meters with surge-proof magnets and:	
	(a) Mech KWH Register	16
	(b) Mech Demand Registers	10
	(c) Electronic Demand Register	16
	(d) Mech Cam Pulse Initiator	2
	(e) Mech Gear Shutter Pulse Initiator	8
	(f) Electronic Pulse Initiator	12
	(g) Electronic Remote Registers	8
	(h) Electronic TOU Register	16
(6)	Electronic Meter	16
	For single phase and polyphase <i>transformer rated</i> meters:	
(7)	Electronic Meters	
	(a) Billing Constant 500 or less	12
	(b) Billing Constant 500 - 10,000	8
	(c) Billing Constant >10,000	4
(8)	Electromechanical Watthour Meters with surge proof magnets	
	(a) Billing Constant 500 or less	8
	(b) Billing Constant >500	4

Test interval is based on the Billing Constant which equals the absolute CT ratio X VT ratio. (i.e. With a 40:1 CT and a 60:1 VT ratio, the Billing Constant is 2400)

JOINT RESPONSE OF THE UTILITIES:
INTER COUNTY ENERGY COOPERATIVE,
KENTUCKY POWER COMPANY, KENTUCKY UTILITIES COMPANY,
LOUISVILLE GAS & ELECTRIC, OWEN ELECTRIC COOPERATIVE,
SHELBY ENERGY COOPERATIVE,
UNION LIGHT, HEAT & POWER COMPANY

REQUEST:

Please refer to the information submitted by the utilities at the June 3, 1998 meeting with the Commission Staff. On the report titled "In Service Meter Test Data", column "Other", please list the different categories which make up that column, such as field - other, field- initial, shop-old, maintenance, high bill.

RESPONSE:

The Parties are in the process of seeking clarification from Staff concerning the information being sought by this Data Request and will respond in a timely fashion following the discussion.

COMMONWEALTH OF KENTUCKY
BEFORE THE PUBLIC SERVICE COMMISSION

RECEIVED

APR 17 2000

PUBLIC SERVICE
COMMISSION

In the Matter of:

THE JOINT APPLICATION OF INTER COUNTY)
ENERGY CORPORATION, KENTUCKY POWER)
COMPANY D/B/A AMERICAN ELECTRIC POWER)
COMPANY, KENTUCKY UTILITIES COMPANY,)
LOUISVILLE GAS & ELECTRIC, OWEN)
ELECTRIC COOPERATIVE, INC, SHELBY)
ENERGY COOPERATIVE, THE UNION LIGHT,)
HEAT AND POWER COMPANY)
(COLLECTIVELY CALLED UTILITIES) FOR)
APPROVAL OF A PILOT METER TESTING)
PLAN PURSUANT TO 807 KAR 5:041,)
SECTIONS 13, 15, 16, 17 AND 22)

CASE NO. 99-441

Petition for Confidential Treatment

Inter County Energy Corporation, Kentucky Power Company d/b/a American Electric Power, Kentucky Utilities Company, Louisville Gas & Electric, Owen Electric Cooperative, Inc., Shelby Energy Cooperative and The Union Light, Heat and Power Company ("Utilities") move the Public Service Commission of Kentucky ("Commission") pursuant to KRS 61.878(1)(c)(1) and 807 KAR 5:001, Section 7(2) to accord confidential treatment to the information filed herewith, and in support thereof state:

1. In response to Data Request No. 1 from the March 8, 2000 informal conference, the Utilities are filing with the Commission meter testing procedures, standards and ancillary material for General Electric Company and Schlumberger Industries, Electric and Gas Division. The information was provided by General Electric Company to American Electric Power, and by Schlumberger Industries, Electric and Gas Division to Louisville Gas & Electric pursuant to

confidentiality agreements whereby American Electric Power and Louisville Gas and Electric agreed to protect the information from public disclosure.

2. The Utilities are informed by General Electric Company and Schlumberger Industries, Electric and Gas Division that the information for which confidential treatment is sought is not publicly known outside the companies, except pursuant to confidentiality agreements, and is protected by the companies from public disclosure through efforts that are reasonable under the circumstances.

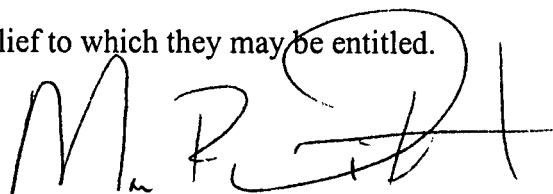
3. Such testing methods are generally recognized as confidential and proprietary, and the disclosure of the information will give the competitors of General Electric Company and Schlumberger Industries, Electric and Gas Division an unfair economic advantage.

4. Filed with this Petition is one copy of the information that identifies by highlighting those portions of the information, which if disclosed, would result in the disclosure of confidential information. Also filed are ten copies of the information with the confidential information obscured.

Wherefore, Inter County Energy Corporation, Kentucky Power Company d/b/a American Electric Power, Kentucky Utilities Company, Louisville Gas & Electric, Owen Electric Cooperative, Inc., Shelby Energy Cooperative and The Union Light, Heat and Power

Company respectfully request that:

1. The attached information., as shown on the highlighted copy, be accorded confidential treatment and placed in the confidential files of the Commission;
2. They be accorded all other relief to which they may be entitled.

A handwritten signature in black ink, appearing to read 'M. R. Overstreet', with a horizontal line drawn underneath it.

Mark R. Overstreet
STITES & HARBISON
421 West Main Street
P.O. Box 634
Frankfort, Kentucky 40602
Telephone: (502) 223-3477
COUNSEL FOR KENTUCKY POWER
COMPANY D/B/A AMERICAN ELECTRIC
POWER

KE057:00KE4:3837:FRANKFORT

OPERATING PROCEDURES AND INSTRUCTIONS

**CALIBRATION AND TRACEABILITY OF
WATTHOUR TEST BOARDS**

O NO. N-Q024

PAGE: 1 OF 16

ISSUE NO. 7

DATE: 06/18/97

APPROVED BY: D. MAIN

SUPERSEDES: ISSUE # 6

REFERENCE:

1.0 PURPOSE

2.0 SCOPE

3.0 POLICY

4.0 APPLICABLE DOCUMENTS

OPERATING PROCEDURES AND INSTRUCTIONS

**CALIBRATION AND TRACEABILITY OF
WATTHOUR TEST BOARDS**

O NO. N-Q024
PAGE: 2 OF 16
ISSUE NO. 7 DATE: 06/18/97
APPROVED BY: D. MAIN
SUPERSEDES: ISSUE # 6

REFERENCE:

5.0 RESPONSIBILITIES

OPERATING PROCEDURES AND INSTRUCTIONS

**CALIBRATION AND TRACEABILITY OF
WATTHOUR TEST BOARDS**

O NO. N-Q024
PAGE: 4 OF 16
ISSUE NO. 7 DATE: 06/18/97
APPROVED BY: D. MAIN
SUPERSEDES: ISSUE # 6

REFERENCE:

6.0 SPECIFIC CALIBRATION PROCEDURES

Schlumberger

Electricity & Gas

Electricity Division

OPERATING PROCEDURES AND INSTRUCTIONS

**CALIBRATION AND TRACEABILITY OF
WATTHOUR TEST BOARDS**

O NO. N-Q024
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APPROVED BY: D. MAIN
SUPERSEDES: ISSUE # 6

REFERENCE:

OPERATING PROCEDURES AND INSTRUCTIONS

**CALIBRATION AND TRACEABILITY OF
WATTHOUR TEST BOARDS**

O NO. N-Q024
PAGE: 14 OF 16
ISSUE NO. 7 DATE: 06/18/97
APPROVED BY: D. MAIN
SUPERSEDES: ISSUE # 6

REFERENCE:

Appendix 7

**ERROR CORRECTION LIMITS FOR POLYPHASE,
RFL, SOLID STATE QUANTUM AND KNOPP**

OPERATING PROCEDURES AND INSTRUCTIONS

**CALIBRATION AND TRACEABILITY OF
WATTHOUR TEST BOARDS**

O NO. N-Q024
PAGE: 13 OF 16
ISSUE NO. 7 DATE: 06/18/97
APPROVED BY: D. MAIN
SUPERSEDES: ISSUE # 6

REFERENCE:

Appendix 6

Test Setup Chart: Polyphase
Test Setup Chart for Monitoring Polyphase Comparator
Using The Portable RM11 Standard

OPERATING PROCEDURES AND INSTRUCTIONS

**CALIBRATION AND TRACEABILITY OF
WATTHOUR TEST BOARDS**

O NO. N-Q024
PAGE: 9 OF 16
ISSUE NO. 7 DATE: 06/18/97
APPROVED BY: D. MAIN
SUPERSEDES: ISSUE # 6

REFERENCE:

8.0 RECORDS

Schlumberger

Electricity & Gas

Electricity Division

OPERATING PROCEDURES AND INSTRUCTIONS

**CALIBRATION AND TRACEABILITY OF
WATTHOUR TEST BOARDS**

O NO. N-Q024
PAGE: 3 OF 16
ISSUE NO. 7 DATE: 06/18/97
APPROVED BY: D. MAIN
SUPERSEDES: ISSUE # 8

REFERENCE:

SCHLUMBERGER INDUSTRIES

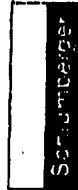
ELECTRICITY DIVISION

CERTIFICATION OF SINGLEPHASE METER ACCURACY

Based on our Quality Assurance monitoring program, Schlumberger J5 meters will exhibit the following "as left" properties:

All J5 watt-hour meters when received by

will fulfill the present accuracy limits as established by the regulatory body governing their operations. Any watt-hour meter failing to meet the requirements of the regulatory body will be repaired or replaced without charge.



Manager, Quality Assurance

OPERATING PROCEDURES AND INSTRUCTIONS

**CALIBRATION AND TRACEABILITY OF
WATTHOUR TEST BOARDS**

O NO. N-Q024
PAGE: 12 OF 16
ISSUE NO. 7 DATE: 06/18/97
APPROVED BY: D. MAIN
SUPERSEDES: ISSUE # 6

REFERENCE:

Appendix 5

ERROR CORRECTION LIMITS FOR SINGLEPHASE

OPERATING PROCEDURES AND INSTRUCTIONS

**CALIBRATION AND TRACEABILITY OF
WATTHOUR TEST BOARDS**

O NO. N-Q024
PAGE: 11 OF 16
ISSUE NO. 7 DATE: 06/18/97
APPROVED BY: D. MAIN
SUPERSEDES: ISSUE # 6

REFERENCE:

Appendix 4

Singlephase Test Setup Chart # 4

OPERATING PROCEDURES AND INSTRUCTIONS

**CALIBRATION AND TRACEABILITY OF
WATTHOUR TEST BOARDS**

O NO. N-Q024
PAGE: 10 OF 16
ISSUE NO. 7 DATE: 06/18/97
APPROVED BY: D. MAIN
SUPERSEDES: ISSUE # 6

REFERENCE:

Appendix 1

Schlumberger

Electricity & Gas
Electricity Division

OPERATING PROCEDURES AND INSTRUCTIONS

**CALIBRATION AND TRACEABILITY OF
WATTHOUR TEST BOARDS**

REFERENCE:

O NO. N-Q024
PAGE: 7 OF 16
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APPROVED BY: D. MAIN
SUPERSEDES: ISSUE # 6

OPERATING PROCEDURES AND INSTRUCTIONS

**CALIBRATION AND TRACEABILITY OF
WATTHOUR TEST BOARDS**

O NO. N-Q024
PAGE: 8 OF 16
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APPROVED BY: D. MAIN
SUPERSEDES: ISSUE # 6

REFERENCE:

7.0 GENERAL

Schlumberger

Electricity & Gas

Electricity Division

OPERATING PROCEDURES AND INSTRUCTIONS

**CALIBRATION AND TRACEABILITY OF
WATTHOUR TEST BOARDS**

PAGE: 6 OF 16

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O NO. N-Q024

DATE: 06/18/97

APPROVED BY: D. MAIN

SUPERSEDES: ISSUE # 6

REFERENCE:

OPERATING PROCEDURES AND INSTRUCTIONS

**CALIBRATION AND TRACEABILITY OF
WATTHOUR TEST BOARDS**

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APPROVED BY: D. MAIN
SUPERSEDES: ISSUE # 6

REFERENCE:

Appendix 10

TEST POINTS - RFL VERIFICATION

Schlumberger

Electricity & Gas

Electricity Division

O No. N-Q024

Page 16 of 16

OPERATING PROCEDURES AND INSTRUCTIONS

RECORD OF AMENDMENTS

ISSUE NUMBER	SECTION REVISED	PAGES AFFECTED	DESCRIPTION OF CHANGE	APPROVED BY	DATE

PF502-N
031297

OPERATING PROCEDURES AND INSTRUCTIONS

QA AUDITS - FINISHED ELECTROMECHANICAL
ELECTRONIC & 600V INSTRUMENT TRANSFORMER
PRODUCTS

REFERENCE:

O NO. N-Q006

PAGE: 1 OF 7

ISSUE NO. 11 DATE: 03-15-99

APPROVED BY: D. MAIN

SUPERSEDES: ISSUE # 10

1.0 PURPOSE

2.0 SCOPE

3.0 POLICY

4.0 APPLICABLE DOCUMENTS

5.0 PROCEDURES

Schlumberger

Electricity & Gas

Electricity Division

OPERATING PROCEDURES AND INSTRUCTIONS

QA AUDITS - FINISHED ELECTROMECHANICAL,
ELECTRONIC & 600V INSTRUMENT TRANSFORMER
PRODUCTS

REFERENCE:

O NO. N-Q006

PAGE: 2 OF 7

ISSUE NO. 11

DATE: 03-15-99

APPROVED BY: D. MAIN

SUPERSEDES: ISSUE #10

5.1 General

OPERATING PROCEDURES AND INSTRUCTIONS

QA AUDITS - FINISHED ELECTROMECHANICAL
ELECTRONIC & 600V INSTRUMENT TRANSFORMER
PRODUCTS

REFERENCE:

O NO. N-Q006

PAGE: 3 OF 7

ISSUE NO. 11

DATE: 03-15-99

APPROVED BY: D. MAIN

SUPERSEDES: ISSUE # 10

5.2 Defect Types

OPERATING PROCEDURES AND INSTRUCTIONS

QA AUDITS - FINISHED ELECTROMECHANICAL
ELECTRONIC & 600V INSTRUMENT TRANSFORMER
PRODUCTS

REFERENCE:

O NO. N-Q006

PAGE: 4 OF 7

ISSUE NO. 11

DATE: 03-15-99

APPROVED BY: D. MAIN

SUPERSEDES: ISSUE # 10

5.3 Action Taken

OPERATING PROCEDURES AND INSTRUCTIONS

QA AUDITS - FINISHED ELECTROMECHANICAL
ELECTRONIC & 600V INSTRUMENT TRANSFORMER
PRODUCTS

REFERENCE:

O NO. N-Q006

PAGE: 5 OF 7

ISSUE NO. 11 DATE: 03-15-99

APPROVED BY: D. MAIN

SUPERSEDES: ISSUE # 10

5.4 Quality of Product Audited

Schlumberger

Electricity & Gas

Electricity Division

OPERATING PROCEDURES AND INSTRUCTIONS

QA AUDITS - FINISHED ELECTROMECHANICAL
ELECTRONIC & 600V INSTRUMENT TRANSFORMER
PRODUCTS

REFERENCE:

O NO. N-Q006

PAGE: 6 OF 7

ISSUE NO. 11 DATE: 03-15-99

APPROVED BY: D. MAIN

SUPERSEDES: ISSUE # 10

5.5 Audit Summary

5.6 Authority

Schlumberger

Electricity & Gas

Electricity Division

O No. N-Q006

Page 7 of 7

OPERATING PROCEDURES AND INSTRUCTIONS

RECORD OF AMENDMENTS

ISSUE NUMBER	SECTION REVISED	PAGES AFFECTED	DESCRIPTION OF CHANGE	APPROVED BY	DATE

PF502-N
031297

KV Final Test & Calibration

General

Functional Tests

1. Display

2. Switches

KV Final Test & Calibration

3. Firmware Version & Error Flags

4. Revenue Guard Board

5. Simple I/O Board

6. LP2 Board

7. Modem Board

8. RSX Board

KV Final Test & Calibration

Accuracy Tests

Table of Tests for a 9S Class 200 Meter

Soft Switches

Customer Programming

TYPE: Standard

LAB INSTRUCTION NO: STD-3

CLASSIFICATION: Calibration

SUBJECT: I-70 Round Robin, 3A Factory and QC Audit Panels #1 & #2

A. PURPOSE:

B. RESPONSIBILITY

C. PROCEDURE

Issued By
Supervisor-Eng
Laboratory

Date Issued
[Signature]
1-21-97

Supersedes Issue Dated
8-11-94

Page
1 of 1

TYPE: Standard

LAB INSTRUCTION NO. STD-46

CLASSIFICATION: Calibration

SUBJECT: Traceability to N.I.S.T.

A. PURPOSE:

B. PROCEDURE

Issued By	Date Issued	Supersedes Issue Dated	Page
Supervisor-Eng Laboratory	<i>[Signature]</i> 1-17-97	8-11-94	1 of 1



**METER BUSINESS
INSTRUCTION**

SUBJECT: kV Meter

4A WECO Panels (Round Robin)

CLASSIFICATION:

Calibration

NUMBER:

STD - 51

Purpose:

Responsibility:

Procedure:

Issued by:
Supervisor - Engineering
Laboratory

Date Issued:

11/06/97

Supersedes Issue Dated:

01/28/97.

Page

1 of 1

(6)

REPORT OF CALIBRATION

WATTHOUR STANDARD
80-520 Volts; 0.2-50 Amperes; 59-61 Hertz
Radian Research Type RM-11-01
Serial No. 5217

Submitted by

General Electric Company
130 Main Street
Somersworth, New Hampshire 03878

Measurements performed by:

For the Director,

Test Report No: 811/261915-99
Reference: LH74433
Date: October 19, 1999
Telephone Contact: 301-975-4221

(7)

WATTHOUR STANDARD
Radian Research Model RM-11-01; Serial Number 5217
General Electric Company

Wathour Meter Calibration

Voltage Applied (volts)	Current Applied (amperes)	Power Factor	Percentage Registration	Uncertainty (percent)
-------------------------------	---------------------------------	-----------------	----------------------------	--------------------------

Test Report No: 811/261915-99

Reference: LH74433

Date: October 19, 1999

Telephone Contact: 201-275-2221

BFC FRANKFORD P. 009/009

TO

REP KENTUCKY RATES DEPT

10

FROM

15:01

APR-11-2000



Paul E. Patton, Governor
Ronald B. McCloud, Secretary
Public Protection and
Regulation Cabinet

Martin J. Huelsmann
Executive Director
Public Service Commission

COMMONWEALTH OF KENTUCKY
PUBLIC SERVICE COMMISSION
211 SOWER BOULEVARD
POST OFFICE BOX 615
FRANKFORT, KENTUCKY 40602-0615
www.psc.state.ky.us
(502) 564-3940

B. J. Helton
Chairman

Edward J. Holmes
Vice Chairman

Gary W. Gillis
Commissioner

March 21, 2000

PARTIES OF RECORD:

Re: Case No. 99-441
Inter-County Energy Cooperative Corporation

Gentlemen:

Attached is a copy of the memorandum which is being filed in the record of the above referenced case. If you have any comments you would like to make regarding the contents of the informal conference memorandum, please do so within five days of receipt of this letter. Should you have any questions regarding same, please contact Elie Russell at 502/564-3940, Extension 422.

Sincerely,

A handwritten signature in cursive script, appearing to read "Martin J. Huelsmann".

Martin J. Huelsmann
Executive Director

Attachment



TO: Main Case File: 99-441
FROM: Elie Russell, Engineer *ER*.
DATE: March 14, 2000
RE: Pilot Meter Testing Plan

RECEIVED

MAR 21 2000

**PUBLIC SERVICE
COMMISSION**

Pursuant to the Commission's February 23, 2000 Order, an informal conference was held at the Commission's offices on March 8, 2000. A list of the attendees is attached hereto.

Inter County Energy Cooperative Corporation, Kentucky Power Company d/b/a American Electric Power, Kentucky Utilities Company, Louisville Gas and Electric, Owen Electric Cooperative, Inc., Shelby Energy Cooperative Inc., and the Union Light, Heat and Power Company ("Utilities") and the Commission staff discussed the response to the Commission's data requests dated December 29, 1999. The following issues were discussed:

1. The Utilities stated that they will continue to employ certified meter testers, but this requirement should not apply to a manufacturer. Staff raised the question of how can the PSC be assured that the manufacturer employees who will be performing the test are qualified? The Utilities agreed to get information from the meter manufacturers regarding their requirement to qualify meter testers. The Utilities will file this information with the Commission.
2. The Utilities agreed that the performance of new meters is considered to be acceptable when the percent registration is not less than 99% or more than 101%.
3. Staff indicated that the Utilities' proposals show that some "lot sizes" are very large. The utilities agreed to revise their meter lot size. Staff and the Utilities agreed that a key element of any sample-testing program is the formation of homogeneous lots. The most important facet of the program will be defining the lots so that they are homogeneous.
4. The Utilities agreed to revise the table entitled "Periodic Testing Schedule" which changes periodic test frequencies.
5. The Utilities will file copies of meter test plans based on AQL 2.5, which are currently performed by electric utilities operating in other states.
6. The Utilities will address the reporting documents, which will be filed annually prescribing the testing of the meters according to the pilot plan.

7. The Utilities will file an early removal plan for the meter groups that fail the test and the time frame for removing the failing lot.

The Utilities indicated that an amended application will be filed no later than April 17, 2000 that will reflect the changes discussed at the informal conference.

Attendees

3-8-2000

1. Judi Willis AEP 606 327 1283
2. Amy Bush Inter County 606-236-4561
3. Charlie Ploeger Cinergy/ULH4P 513-287-5751
4. DAVID GRAHAM SHELBY ENERGY 502-633-4420
5. Dudley Bottom, Jr. " " "
6. Jack Carr AEP 614 883 7509
7. Danny Spalding Owen Electric 502-484-3471
8. Marty Goinant Mi/LLC 502-627-4173
9. Chuck Schram KU/Love 502 364 8280
10. Errol K Wagner AEP Kentucky 606 327 1285
11. Mark R. Overstreet ST. TER: MARSHW (AEP) 502-223-3477
12. Bill Bosta KU/LGIE 502-627-2359
13. Richard Raff KY PSC
14. Denis P. Hildebrand KY PSC
15. Elie Russell Ky PSC
16. Faud Sharifi PSC.
17. Bob Amato PSC
18. Michael Nantz PSC
19. Marvin Goff PSC
20. Brian Rice PSC



COMMONWEALTH OF KENTUCKY
PUBLIC SERVICE COMMISSION
211 SOWER BOULEVARD
POST OFFICE BOX 615
FRANKFORT, KY. 40602
(502) 564-3940

February 23, 2000

To: All parties of record

RE: Case No. 1999-441

We enclose one attested copy of the Commission's Order in
the above case.

Sincerely,

A handwritten signature in cursive script that reads "Stephanie Bell".

Stephanie Bell
Secretary of the Commission

SB/hv
Enclosure

James L. Jacobus
President/CEO
Inter-County Energy Cooperative
Corporation
1009 Hustonville Road
P. O. Box 87
Danville, KY 40423 0087

Honorable William M. Dishman
Counsel for Inter County Energy
Silliman, Dishman & Nickels
P.O. Box 850
Danville, KY 40423 0850

Errol K. Wagner
Director of Regulatory Affairs
American Electric Power
1701 Central Avenue
P. O. Box 1428
Ashland, KY 41105 1428

Honorable Douglas M. Brooks
Senior Counsel Specialist, Reg.
Louisville Gas and Electric
Kentucky Utilities Company
220 West Main Street
Louisville, KY 40202

Ronald Willhite
Vice President Regulatory Affairs
Louisville Gas and Electric Company
220 W. Main Street
P. O. Box 32010
Louisville, KY 40232 2010

Honorable James M. Crawford
Counsel for Owen Electric
Crawford & Baxter, P.S.C.
Attorneys at Law
523 Highland Avenue
P.O. Box 353
Carrollton, KY 41008

Frank Downing
Manager
Owen Electric Cooperative, Inc.
510 South Main Street
P. O. Box 400
Owenton, KY 40359

Honorable Donald T. Prather
Counsel for Shelby Energy
Mathis, Riggs & Prather, P.S.C.
Attorneys at Law
500 Main Street
P.O. Box 1059
Shelbyville, KY 40065

Dudley Bottom
General Manager
Shelby Energy Cooperative, Inc.
620 Old Finchville Road
Shelbyville, KY 40065

Honorable John J. Finnigan
Senior Counsel
The Union Light, Heat & Power Co.
139 E. Fourth Street
25th Fl. Atrium II
Cincinnati, OH 45202

James B. Gainer
Legal Division
The Union Light Heat & Power Co
139 E. Fourth Street
Cincinnati, OH 45202

Honorable Mark R. Overstreet
Counsel for American Electric Power
Stites & Harbison
421 West Main Street
Post Office Box 634
Frankfort, KY 40602 0634

COMMONWEALTH OF KENTUCKY
BEFORE THE PUBLIC SERVICE COMMISSION

In the Matter of:

THE JOINT APPLICATION OF KENTUCKY UTILITIES:)
INTER COUNTY ENERGY COOPERATIVE)
CORPORATION, KENTUCKY POWER COMPANY,)
D/B/A AMERICAN ELECTRIC POWER, KENTUCKY)
UTILITIES COMPANY, LOUISVILLE GAS AND)
ELECTRIC, OWEN ELECTRIC COOPERATIVE,)
SHELBY ENERGY COOPERATIVE, THE UNION)
LIGHT, HEAT AND POWER COMPANY)
COLLECTIVELY CALLED ("UTILITIES") FOR)
APPROVAL OF A PILOT METER TESTING PLAN)
PURSUANT TO 807 KAR 5:041, SECTIONS 13,15)
16,17 AND 22)

CASE NO.
99-441

ORDER

The Commission, on its own motion, HEREBY ORDERS that an informal conference to discuss the utilities' responses to the Commission's December 29 Order shall be held on March 8, 2000 at 9:30 a.m. EST in Conference Room 2 of the Commission's offices at 211 Sower Blvd., Frankfort, Kentucky.

Done at Frankfort, Kentucky, this 23rd day of February, 2000.

By the Commission

ATTEST:

Deputy *Wm H. Barber*
Executive Director

STITES & HARBISON

ATTORNEYS

RECEIVED

JAN 21 2000

PUBLIC SERVICE
COMMISSION

421 West Main Street
Post Office Box 634
Frankfort, KY 40602-0634
[502] 223-3477
[502] 223-4124 Fax
www.stites.com

January 21, 2000

Mr. Martin J. Huelsmann
Executive Director
Public Service Commission of Kentucky
P.O. Box 615
Frankfort, KY 40602-0615

Mark R. Overstreet
[502] 209-1219
moverstreet@stites.com

RE: *P.S.C. Case No. 99-441 (Pilot Meter Testing Plan)*

Dear Mr. Huelsmann:

Please find and accept for filing an original and ten copies of the Joint Utilities Responses to the Commission's Order dated December 29, 1999 in the above case.

Thank you for your assistance in this matter.

Very truly yours,


Mark R. Overstreet

Enclosures

KE057:00KE4:3369:FRANKFORT

RECEIVED

JAN 21 2000

PUBLIC SERVICE
COMMISSION

**COMMONWEALTH OF KENTUCKY
BEFORE THE PUBLIC SERVICE COMMISSION**

In the matter of:

THE JOINT APPLICATION OF THE UTILITIES:)
INTER COUNTY ENERGY COOPERATIVE)
CORPORATION, KENTUCKY POWER COMPANY,)
D/B/A AMERICAN ELECTRIC POWER, KENTUCKY)
UTILITIES COMPANY, LOUISVILLE GAS AND)
ELECTRIC, OWEN ELECTRIC COOPERATIVE,)
SHELBY ENERGY COOPERATIVE, THE UNION)
LIGHT, HEAT AND POWER COMPANY)
COLLECTIVELY CALLED ("UTILITIES") FOR)
APPROVAL OF A PILOT METER TESTING PLAN)
PURSUANT TO 807 KAR 5:041, SECTIONS 13, 15)
16, 17 AND 22)

CASE NO. 99-441

**RESPONSE OF THE JOINT UTILITIES TO THE
KPSC DATA REQUESTS DATED DECEMBER 29, 1999**

21 January 2000

COMMONWEALTH OF KENTUCKY
BEFORE THE PUBLIC SERVICE COMMISSION

In the Matter of:

THE JOINT APPLICATION OF THE UTILITIES:)
INTER COUNTY ENERGY COOPERATIVE)
CORPORATION, KENTUCKY POWER COMPANY,)
D/B/A AMERICAN ELECTRIC POWER, KENTUCKY)
UTILITIES COMPANY, LOUISVILLE GAS AND)
ELECTRIC, OWEN ELECTRIC COOPERATIVE,)
SHELBY ENERGY COOPERATIVE, THE UNION) CASE NO. 99-441
LIGHT, HEAT AND POWER COMPANY)
COLLECTIVELY CALLED ("UTILITIES") FOR)
APPROVAL OF A PILOT METER TESTING PLAN)
PURSUANT TO 807 KAR 5:041, SECTIONS 13, 15,)
16, 17 AND 22)

O R D E R

IT IS ORDERED that the Utilities shall file the original and 10 copies of the following information with the Commission with a copy to all parties of record by January 21, 2000. Each copy should be placed in a bound volume with each item tabbed. When a number of sheets are required for an item, each sheet should be indexed appropriately. The Utilities shall furnish with each response the name of the witness who will be available to respond to questions concerning each item of information requested should a public hearing be scheduled.

1. If the Utility plans to have new meter devices tested by the manufacturer:
 - a. Provide information demonstrating that all requirements noted in 807 KAR 5:006, Section 16, will be met.

b. Provide information demonstrating that all requirements noted in 807 KAR 5:041, Section 14(1) & (2), will be met.

c. Will the Utilities sample test the new meters tested by the manufacturers?

(1) If yes, provide information regarding the type of sample testing of new metering devices the utility will perform. Specifically, what Acceptable Quality Levels ("AQL"), Lot Size, and Inspection Level would be used?

(2) If no, explain why.

d. Provide information demonstrating that all requirements noted in 807 KAR 5:006, Section 17(1)(a), will be met.

2. Provide, for each utility, the number of meters tested each year beginning with 1996. Indicate for each year whether the numbers represent testing under a periodic or an approved sample-testing program.

3. Refer to the Utilities' application, Appendix A, II (B)(3)(b). Explain why the acceptability criteria will be based on an upper limit of 102 percent and a lower limit of 98 percent instead of an upper limit of 101 percent and a lower limit of 99 percent.

4. Refer to the Utilities' application, Appendix A, II (D)(3)(b). Explain why the Utilities did not limit the lot size to a maximum of 10,000 meters.

5. Refer to the Utilities' application, Appendix A, II(C)(3). Explain why meters removed from service will not be tested.

6. Refer to the Utilities' application, Appendix A, III (B)(2). Explain why instrument transformers removed from service will not be tested.

7. Refer to the Utilities' application, Appendix A, III (A)(1). Explain why the performance of a mechanical or lagged demand register shall be acceptable when the error in demand registration does not exceed ± 4 percent instead of ± 2 percent.

8. How many electromechanical and ball/jewel bearing suspension meters are operated by each utility in 1999?

9. Is there an early removal program for the jewel bearing suspension meters? Explain.

10. Provide the criteria for segregating the meters into homogeneous control groups.

11. Provide criteria for combining control groups.

12. Refer to the joint application. The Utilities have requested several deviations from Commission regulations. Provide a list of the deviations requested and the rationale for requesting each one of them. Explain in detail.

13. Provide the estimated savings, for each individual utility, for implementing the pilot meter-testing plan.

14. Provide the plan for early removal of the control group when its sample does not meet prescribed performance standards.

15. What is the anticipated largest control lot size? What is the smallest acceptable sample size?

16. Explain and provide any written information that supports the elimination of the 25-year service life for the meters. What is the proposed service life in the plan?

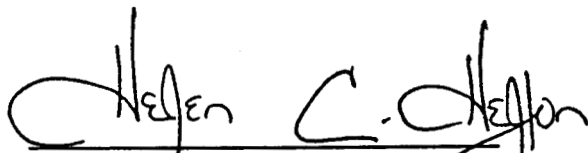
17. What is the rationale for selecting inspection level II, and AQL of 2.5?

18. Refer to the Utilities' application, page 6 of the Appendix A. Explain the rationale of establishing an additional lot when a sample of a control group fails the test.

Done at Frankfort, Kentucky, this 29th day of December, 1999.

By the Commission

ATTEST:


Executive Director

JOINT RESPONSE OF THE UTILITIES:
INTERCOUNTY ENERGY COOPERATIVE, KENTUCKY
POWER COMPANY, KENTUCKY UTILITIES COMPANY,
LOUISVILLE GAS & ELECTRIC, OWEN ELECTRIC
COOPERATIVE, SHELBY ENERGY COOPERATIVE,
UNION LIGHT, HEAT & POWER COMPANY

REQUEST:

If the Utility plans to have new meter devices tested by the manufacturer:

- a. Provide information demonstrating that all requirements noted in 807KAR 5:006, Section 16, will be met.
- b. Provide information demonstrating that all requirements noted in 807 KAR 5:041, Section 14(1) & (2), will be met.
- c. Will the Utilities sample test the new meters tested by the manufacturers?
 - (1) If yes, provide information regarding the type of sample testing of new metering devices the utility will perform. Specifically, what Acceptable Quality Levels ("AQL"), Lot Size, and Inspection Level would be used?
 - (2) If no, explain why.
- d. Provide information demonstrating that all requirements noted in 807 KAR 5:006, Section 17(1)(a), will be met.

RESPONSE:

- a. 807KAR 5:006, Section 16 (1)

Manufacturers test 100% of meters and instrument transformers and will supply the resulting test data to the utilities. This test data is stored as a permanent record, similar to other test data. All new meters received from the manufacturer will be within operating tolerances specified in Regulation 807 KAR 5:006, Section 16(1).

807KAR 5:006, Section 16(2)

All manufacturers maintain traceability to the National Standard Institute of Testing (NIST). The type of standards and serial numbers of the manufacturer's transfer or primary standards is available from each utility.

807KAR 5:006, Section 16(3)

All Utilities shall sample test new meters and instrument transformers to ensure that the manufacturer's test results are valid. All Utilities' standards shall continue to be tested by the Commission.

807KAR 5:006, Section 16(4, 5, 6)

All Utilities will continue to employ certified meter testers capable of testing and adjusting devices as necessary but this requirement should not apply to a manufacturer.

JOINT RESPONSE OF THE UTILITIES:
INTERCOUNTY ENERGY COOPERATIVE, KENTUCKY
POWER COMPANY, KENTUCKY UTILITIES COMPANY,
LOUISVILLE GAS & ELECTRIC, OWEN ELECTRIC
COOPERATIVE, SHELBY ENERGY COOPERATIVE,
UNION LIGHT, HEAT & POWER COMPANY

b. 807KAR 5:041 (1)

The Utilities shall continue to have their standards tested by the Commission. The Utilities shall sample new meters to ensure compliance with Commission requirements.

807KAR 5:041(2)

If the Commission requires a test of one of the manufacturer's KWH transfer standards, the utilities' shall work with the manufacturer to make it available for the Commission to test.

c. Yes. The Utilities shall incorporate and maintain all manufacturers' test results as a permanent part of their meter records. The Utilities will continue to meet all requirements of this section. The Lot Size will be dependent upon the number of meters, by type, purchased, the AQL will be based on 1.0, and the Inspection Level will be II.

d. The Utilities shall maintain all manufacturers' test results as a permanent part of their meter records as they do for all meter tests.

JOINT RESPONSE OF THE UTILITIES:
INTERCOUNTY ENERGY COOPERATIVE, KENTUCKY
POWER COMPANY, KENTUCKY UTILITIES COMPANY,
LOUISVILLE GAS & ELECTRIC, OWEN ELECTRIC
COOPERATIVE, SHELBY ENERGY COOPERATIVE,
UNION LIGHT, HEAT & POWER COMPANY

REQUEST:

Provide, for each utility, the number of meters tested each year beginning with 1996. Indicate for each year whether the numbers represent testing under a periodic or an approved sample-testing program.

RESPONSE:

Please see attached pages for each utility.

JOINT RESPONSE OF THE UTILITIES:
INTERCOUNTY ENERGY COOPERATIVE, KENTUCKY
POWER COMPANY, KENTUCKY UTILITIES COMPANY,
LOUISVILLE GAS & ELECTRIC, OWEN ELECTRIC
COOPERATIVE, SHELBY ENERGY COOPERATIVE,
UNION LIGHT, HEAT & POWER COMPANY

REQUEST:

Provide, for each utility, the number of meters tested each year beginning with 1996. Indicate for each year whether the numbers represent testing under a periodic or an approved sample-testing program.

RESPONSE:

Inter County Energy		
<u>Year</u>	<u>Meters Tested</u>	<u>Testing Program</u>
1996	3,507	Periodic
1997	2,481	Sample
1998	1,902	Sample
1999	779	Sample

WITNESS: Stephen D. Souder

JOINT RESPONSE OF THE UTILITIES:
INTERCOUNTY ENERGY COOPERATIVE, KENTUCKY
POWER COMPANY, KENTUCKY UTILITIES COMPANY,
LOUISVILLE GAS & ELECTRIC, OWEN ELECTRIC
COOPERATIVE, SHELBY ENERGY COOPERATIVE,
UNION LIGHT, HEAT & POWER COMPANY

REQUEST:

Provide, for each utility, the number of meters tested each year beginning with 1996. Indicate for each year whether the numbers represent testing under a periodic or an approved sample-testing program.

RESPONSE:

AEP/KENTUCKY

Year	1996	1997	1998	1999 (Preliminary)
Sample	1,137	1,127	1,104	591
Additional Sample (Includes 25 year tests)	2,983	585	2,213	4,422
Periodic	1,921	967	1,468	2,239
New	5,449	5,329	4,3512	5,180
Other	12,377	13,460	10,243	2,996
Total	23,867	21,468	19,379	15,438

WITNESS: Jack E. Carr

JOINT RESPONSE OF THE UTILITIES:
INTERCOUNTY ENERGY COOPERATIVE, KENTUCKY
POWER COMPANY, KENTUCKY UTILITIES COMPANY,
LOUISVILLE GAS & ELECTRIC, OWEN ELECTRIC
COOPERATIVE, SHELBY ENERGY COOPERATIVE,
UNION LIGHT, HEAT & POWER COMPANY

REQUEST:

Provide, for each utility, the number of meters tested each year beginning with 1996. Indicate for each year whether the numbers represent testing under a periodic or an approved sample-testing program.

RESPONSE:

Kentucky Utilities Company

Year	1996	1997	1998	1999
Sample	17,960	17,899	18,309	18,187
Other	47,397	49,755	44,491	48,953
Total	65,357	67,654	62,800	67,140

WITNESS: Chuck Schram

JOINT RESPONSE OF THE UTILITIES:
INTERCOUNTY ENERGY COOPERATIVE, KENTUCKY
POWER COMPANY, KENTUCKY UTILITIES COMPANY,
LOUISVILLE GAS & ELECTRIC, OWEN ELECTRIC
COOPERATIVE, SHELBY ENERGY COOPERATIVE,
UNION LIGHT, HEAT & POWER COMPANY

REQUEST:

Provide, for each utility, the number of meters tested each year beginning with 1996. Indicate for each year whether the numbers represent testing under a periodic or an approved sample-testing program.

RESPONSE:

Louisville Gas & Electric Company

Year	1996	1997	1998	1999
Sample	11,877	13,270	7,359	7,256
Other	18,824	21,696	20,364	19,874
Total*	30,701	34,966	27,723	27,130

*Totals shown above include Periodic, New and routine Meter Tests

WITNESS: Chuck Schram

JOINT RESPONSE OF THE UTILITIES:
INTERCOUNTY ENERGY COOPERATIVE, KENTUCKY
POWER COMPANY, KENTUCKY UTILITIES COMPANY,
LOUISVILLE GAS & ELECTRIC, OWEN ELECTRIC
COOPERATIVE, SHELBY ENERGY COOPERATIVE,
UNION LIGHT, HEAT & POWER COMPANY

REQUEST:

Provide, for each utility, the number of meters tested each year beginning with 1996. Indicate for each year whether the numbers represent testing under a periodic or an approved sample-testing program.

RESPONSE:

Owen Electric Cooperative

<u>Year</u>	<u>Meters Tested</u>
1996	1,104
1997	1,500
1998	1,833
1999	1,997

All meters tested since 1996 have been done so under an approved sample-testing program

WITNESS: Danny Stockdale

JOINT RESPONSE OF THE UTILITIES:
INTERCOUNTY ENERGY COOPERATIVE, KENTUCKY
POWER COMPANY, KENTUCKY UTILITIES COMPANY,
LOUISVILLE GAS & ELECTRIC, OWEN ELECTRIC
COOPERATIVE, SHELBY ENERGY COOPERATIVE,
UNION LIGHT, HEAT & POWER COMPANY

REQUEST:

Provide, for each utility, the number of meters tested each year beginning with 1996. Indicate for each year whether the numbers represent testing under a periodic or an approved sample-testing program.

RESPONSE:

Shelby Energy Cooperative Inc.

<u>Year</u>	<u>Meters Tested</u>
1996	597
1997	1,028
1998	816
1999	Appx. 800

All single-phase self-contained meters were tested under an approved sample test plan. However, the above yearly totals include all meters tested for that year.

WITNESS: Dudley Bottom, Jr.

JOINT RESPONSE OF THE UTILITIES:
INTERCOUNTY ENERGY COOPERATIVE, KENTUCKY
POWER COMPANY, KENTUCKY UTILITIES COMPANY,
LOUISVILLE GAS & ELECTRIC, OWEN ELECTRIC
COOPERATIVE, SHELBY ENERGY COOPERATIVE,
UNION LIGHT, HEAT & POWER COMPANY

REQUEST:

Provide, for each utility, the number of meters tested each year beginning with 1996. Indicate for each year whether the numbers represent testing under a periodic or an approved sample-testing program.

RESPONSE:

Union Light, Heat & Power Company

Year	1996	1997	1998	1999 Preliminary
Sample	2,266	2,314	2,993	3,077
25 year tests	106	1,894	1,149	1,327
Periodic	706	1,081	633	684
New	5,261	13,155	9,764	8,388
Other	2,581	3,617	4,253	4,370
Total	10,920	22,061	18,792	17,891

WITNESS: Charlie Ploeger

1951-1952

JOINT RESPONSE OF THE UTILITIES:
INTERCOUNTY ENERGY COOPERATIVE, KENTUCKY
POWER COMPANY, KENTUCKY UTILITIES COMPANY,
LOUISVILLE GAS & ELECTRIC, OWEN ELECTRIC
COOPERATIVE, SHELBY ENERGY COOPERATIVE,
UNION LIGHT, HEAT & POWER COMPANY

REQUEST:

Refer to the Utilities' application, Appendix A, II (B)(3)(b). Explain why the acceptability criteria will be based on an upper limit of 102 percent and a lower limit of 98 percent instead of an upper limit of 101 percent and a lower limit of 99 percent.

RESPONSE:

The proposed AQL levels are commonly used in other sample test plans in use by other regulatory bodies. Manufacturers also use the ANSI C12 guidelines to ensure that 98% of the 'in-service' meters can measure within 2% of 100.00 for the life of the meter. Commission guidelines are also based on 2% accuracy limit for error.

WITNESS: See Appendix

**JOINT RESPONSE OF THE UTILITIES:
INTERCOUNTY ENERGY COOPERATIVE, KENTUCKY
POWER COMPANY, KENTUCKY UTILITIES COMPANY,
LOUISVILLE GAS & ELECTRIC, OWEN ELECTRIC
COOPERATIVE, SHELBY ENERGY COOPERATIVE,
UNION LIGHT, HEAT & POWER COMPANY**

REQUEST:

Refer to the Utilities' application, Appendix A, II (d)(3)(b). Explain why the Utilities did not limit the lot size to a maximum of 10,000 meters.

RESPONSE:

The pilot plan followed the ANSI C12.1 and ANSI Z1.9 guidelines for lot size and resulted in additional lots compared to the current sample plans. The proposed homogeneous lots are based on manufacturer's model. The resulting sample sizes are influenced by lot size. Statistically, further subdivision of the homogeneous lots would not produce additional information.

WITNESS: See Appendix

JOINT RESPONSE OF THE UTILITIES:
INTERCOUNTY ENERGY COOPERATIVE, KENTUCKY
POWER COMPANY, KENTUCKY UTILITIES COMPANY,
LOUISVILLE GAS & ELECTRIC, OWEN ELECTRIC
COOPERATIVE, SHELBY ENERGY COOPERATIVE,
UNION LIGHT, HEAT & POWER COMPANY

REQUEST:

Refer to the Utilities' application, Appendix A, II(C)(3). Explain why meters removed from service will not be tested.

RESPONSE:

If a meter is included in an 'in-service' test plan, and its performance in that test plan is acceptable, the meter can be removed and then reinstalled without a test since its accuracy is statistically the same as any other meter in the group. This does not apply to meters flagged for potential operational problems, such as suspected low consumption or damage. If the meter is in a 'to be retired' group, it should be retired without a test unless there is a known problem with a group of meters.

Sample plans are based on the assumption that the selected sample accurately represents the parent population. A meter routinely removed from service for reasons other than sample testing or damage should perform no differently than the sample group. Reinstallation of these meters at a new location without a test closely parallels the way customers routinely change residences without a meter test. In the absence of physical damage it is assumed that the meter is performing like its parent population.

WITNESS: See Appendix

JOINT RESPONSE OF THE UTILITIES:
INTERCOUNTY ENERGY COOPERATIVE, KENTUCKY
POWER COMPANY, KENTUCKY UTILITIES COMPANY,
LOUISVILLE GAS & ELECTRIC, OWEN ELECTRIC
COOPERATIVE, SHELBY ENERGY COOPERATIVE,
UNION LIGHT, HEAT & POWER COMPANY

REQUEST:

Refer to the Utilities' application, Appendix A, III (B)(2). Explain why instrument transformers removed from service will not be tested.

RESPONSE:

Instrument transformers contain no moving parts. Their operation is verified through the resulting meter registration; therefore, when an instrument transformer is removed from service, it can be retired without a test if it shows no signs of damage prior to removal.

WITNESS: See Appendix

JOINT RESPONSE OF THE UTILITIES:
INTERCOUNTY ENERGY COOPERATIVE, KENTUCKY
POWER COMPANY, KENTUCKY UTILITIES COMPANY,
LOUISVILLE GAS & ELECTRIC, OWEN ELECTRIC
COOPERATIVE, SHELBY ENERGY COOPERATIVE,
UNION LIGHT, HEAT & POWER COMPANY

REQUEST:

Refer to the Utilities' application, Appendix A, III (A)(1). Explain why the performance of a mechanical or lagged demand register shall be acceptable when the error in demand registration does not exceed + or - 4 percent instead of + or - 2 percent.

RESPONSE:

The 4% tolerance is an acceptable tolerance for the mechanical or lagged demand register pursuant to ANSI C 12.1. The mechanical or lagged demand registers are not as accurate as electronic demand registers. Experience demonstrates that most mechanical demand meters will register slow while thermal meters can register either fast or slow.

WITNESS: See Appendix

JOINT RESPONSE OF THE UTILITIES:
INTERCOUNTY ENERGY COOPERATIVE, KENTUCKY
POWER COMPANY, KENTUCKY UTILITIES COMPANY,
LOUISVILLE GAS & ELECTRIC, OWEN ELECTRIC
COOPERATIVE, SHELBY ENERGY COOPERATIVE,
UNION LIGHT, HEAT & POWER COMPANY

REQUEST:

How many electromechanical and ball/jewel bearing suspension meters are operated by each utility in 1999?

RESPONSE:

YEAR ENDING 1999

Utility	Electromechanical Meters	Ball/Jewel Bearing Suspension
Inter County Energy	22,150	0
Kentucky Power Company	157,259	0
Kentucky Utilities Company	485,201	6,813
Louisville Gas & Electric Co.	341,193	4,293
Owen Electric Cooperative	41,506	0
Shelby Energy Cooperative	13,000	0
Union Light, Heat & Power	121,586	0

WITNESS: See Appendix

JOINT RESPONSE OF THE UTILITIES:
INTERCOUNTY ENERGY COOPERATIVE, KENTUCKY
POWER COMPANY, KENTUCKY UTILITIES COMPANY,
LOUISVILLE GAS & ELECTRIC, OWEN ELECTRIC
COOPERATIVE, SHELBY ENERGY COOPERATIVE,
UNION LIGHT, HEAT & POWER COMPANY

REQUEST:

Is there an early removal program for the jewel bearing suspension meters? Explain.

RESPONSE:

See chart below. Also refer to response to Item No. 8.

Utility	Early Removal Program	Explain
Inter County Energy	No	All have been retired
Kentucky Power Company	No	All have been retired
Kentucky Utilities Company	No	KU and LG&E have an early retirement program for jewel/suspension meters.
Louisville Gas & Electric	No	See comment for KU shown above.
Owen Electric Cooperative	No	All have been retired
Shelby Energy Cooperative	No	All have been retired
Union Light, Heat & Power	No	All have been retired

WITNESS: See Appendix

JOINT RESPONSE OF THE UTILITIES:
INTERCOUNTY ENERGY COOPERATIVE, KENTUCKY
POWER COMPANY, KENTUCKY UTILITIES COMPANY,
LOUISVILLE GAS & ELECTRIC, OWEN ELECTRIC
COOPERATIVE, SHELBY ENERGY COOPERATIVE,
UNION LIGHT, HEAT & POWER COMPANY

REQUEST:

Provide the criteria for segregating the meters into homogeneous control groups.

RESPONSE:

The criteria for segregating the meters into homogeneous control groups will be based on the manufacturer's model of like design.

WITNESS: See Appendix



JOINT RESPONSE OF THE UTILITIES:
INTERCOUNTY ENERGY COOPERATIVE, KENTUCKY
POWER COMPANY, KENTUCKY UTILITIES COMPANY,
LOUISVILLE GAS & ELECTRIC, OWEN ELECTRIC
COOPERATIVE, SHELBY ENERGY COOPERATIVE,
UNION LIGHT, HEAT & POWER COMPANY

REQUEST:

Provide criteria for combining control groups.

RESPONSE:

The utilities do not intend to combine control groups.

WITNESS: See Appendix

JOINT RESPONSE OF THE UTILITIES:
INTERCOUNTY ENERGY COOPERATIVE, KENTUCKY
POWER COMPANY, KENTUCKY UTILITIES COMPANY,
LOUISVILLE GAS & ELECTRIC, OWEN ELECTRIC
COOPERATIVE, SHELBY ENERGY COOPERATIVE,
UNION LIGHT, HEAT & POWER COMPANY

REQUEST:

Refer to the joint application. The Utilities have requested several deviations from Commission regulations. Provide a list of the deviations requested and the rationale for requesting each one of them. Explain in detail.

RESPONSE:

· Deviations are required from the following sections:

807 KAR 5:041 Section 13, (4)

Deviation Requested: Test Electronic Watthour standards on a 6 month frequency.

Reason for Deviation: Electronic watthour standards are prevalent. They are extremely stable and typically have minimal inaccuracies (less than 0.01%). Accurate standards will be maintained at a reduced test frequency.

807 KAR 5:041 Section 13, (9)

Deviation Requested: Test indicating instruments annually.

Reason for Deviation: Advances in solid state technology support annual testing.

807 KAR 5:041 Section 15 (3)

Deviation Requested: Change periodic test frequencies, eliminate the need to test new meters if they have been tested by a manufacturer, allow meters to be retired without an additional 'retirement' test, and allow good performing meters to be reinstalled without a retest.

Reason for Deviation: The requested practices follow the National Standards for Electricity metering.

Manufacturer's certified test results will be supplied by all meter and instrument transformer manufacturers to the utilities.

As indicated in the utilities' Application, these changes will allow the utilities to maintain accurate metering equipment at lower cost.

807 KAR 5:041 Section 16, Sections (1), (2), (3), (4), (5)

Deviation Requested: Institute a sample plan based on an accepted statistical standard.

Reason for Deviation: As indicated in the Application, smoothing annual test volumes requires that utilities test 4% of the meter population each year. In practice, the 25-year rule creates a periodic override to a sample test plan. Establishment of narrow ANSI test groups along with the elimination of the 25-year rule will concentrate resources on replacing suspect metering equipment. Considerable resources are currently focused on testing large numbers of meters with outstanding historical performance. In general, adoption of an ANSI sample program will mean testing fewer meters out of more groups and result in an improved testing program at a lower cost.

JOINT RESPONSE OF THE UTILITIES:
INTERCOUNTY ENERGY COOPERATIVE, KENTUCKY
POWER COMPANY, KENTUCKY UTILITIES COMPANY,
LOUISVILLE GAS & ELECTRIC, OWEN ELECTRIC
COOPERATIVE, SHELBY ENERGY COOPERATIVE,
UNION LIGHT, HEAT & POWER COMPANY

807 KAR 5:041 Section 17 (1) (c)

Deviation Requested: Base billing accuracy on a weighted average formula.

Reason for Deviation: Allow the utility to approximate the customer's usage on a weighted average formula.

An electromechanical meters' performance is based on the full load (FL) accuracy more than the light load (LL) accuracy. The LL accuracy is typically the meters' performance at less than 10% of the load while the FL accuracy is the performance from 10% to 100%.

WITNESS: See Appendix

JOINT RESPONSE OF THE UTILITIES:
INTERCOUNTY ENERGY COOPERATIVE, KENTUCKY
POWER COMPANY, KENTUCKY UTILITIES COMPANY,
LOUISVILLE GAS & ELECTRIC, OWEN ELECTRIC
COOPERATIVE, SHELBY ENERGY COOPERATIVE,
UNION LIGHT, HEAT & POWER COMPANY

REQUEST:

Provide the estimated savings, for each individual utility, for implementing the pilot meter-testing plan.

RESPONSE:

Please see attached pages for each utility.

JOINT RESPONSE OF THE UTILITIES:
 INTERCOUNTY ENERGY COOPERATIVE, KENTUCKY
 POWER COMPANY, KENTUCKY UTILITIES COMPANY,
 LOUISVILLE GAS & ELECTRIC, OWEN ELECTRIC
 COOPERATIVE, SHELBY ENERGY COOPERATIVE,
 UNION LIGHT, HEAT & POWER COMPANY

REQUEST:

Provide the estimated savings, for each individual utility, for implementing the pilot meter-testing plan.

RESPONSE:

**Inter County Energy
 Annual Cost Saving Estimates Obtained Through Random Meter Testing**

I. Elimination of 25 year test rule:

Residential Meters in Service:	22,098
Average Number Tested per Year (divide by 25):	884
Reduce by 15% (estimate of meters removed before 25 years):	751

Institute a Sample Test Program based on a Scientific Method

Meter tested currently by Inter County:	751
Approximate meters using ANSI Z1.9	467
Difference	284
Multiply by [\$3.32 (Billing Department) + \$4.47 (Service Department) + \$1.29 (Warehouse) + \$4.78 (Cost of Testing Meters) + \$24.81 (Service Man's Labor) + \$2.32 (Vehicle Maintenance)]	\$11,641.16

II. Elimination of 100% Testing of New Meters:

New Residential Meter Tests:	665	Estimated Dollars:	\$ 3,178.70
New Singlephase KWH/KW Meter Tests:	4	Estimated Dollars:	\$ 38.00
New CT Tests:	0	Estimated Dollars:	\$ --
Immediate Total:			\$ 3,216.70

Future Savings on Polyphase Meters:	24	Estimated Dollars	\$ 718.80
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Grand Total:			\$ 3,935.50
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III. Reinstall or retire without a Test:

Residential Meters:	190	Estimated Dollars	\$ 908.20
Singlephase KWH/KW Meters	0	Estimated Dollars	\$ --
Three Phase Meters:	0	Estimated Dollars	\$ --
Current Transformers	0	Estimated Dollars	\$ --
Total			\$ 908.20

Grand Total:			<u>\$16,484.86</u>
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WITNESS: Stephen D. Souder

JOINT RESPONSE OF THE UTILITIES:
 INTERCOUNTY ENERGY COOPERATIVE, KENTUCKY
 POWER COMPANY, KENTUCKY UTILITIES COMPANY,
 LOUISVILLE GAS & ELECTRIC, OWEN ELECTRIC
 COOPERATIVE, SHELBY ENERGY COOPERATIVE,
 UNION LIGHT, HEAT & POWER COMPANY

REQUEST:

Provide the estimated savings, for each individual utility, for implementing the pilot meter-testing plan.

RESPONSE:

Annual Cost Saving Estimates for Kentucky Power Company

I. Elimination of 25 year test rule:

Current Test Method

Residential Meters in Service:	158,405
Math Average (divide by 25):	6,336
Reduce by 15% (estimate of meters removed before 25 years):	5,385

Institute a Sample Test Program based on a Scientific Method ANSI Z1.9-1993

Approximate meters using ANSI Z1.9	800 Meters
Difference (5,385 - 800)	4,585 Meters

Multiply by [0.8 (estimated change out, test, and clerical time) X
 \$15 (estimate wages) X 1.93 (overhead rate): **\$106,188**

II. Elimination of 100% Testing of New Meters:

New Residential Meter Tests	3,479	Estimated Dollars:	\$14,771
New Singlephase KWH/KW Meter Tests:	500	Estimated Dollars:	\$ 6,369
New CT Tests:	500	Estimated Dollars:	\$10,615

Multiply by [X (estimated test time) X \$22 (estimated wages) X 1.93 (overhead rate)]:

X = 0.2 for residential meter test time

X = 0.3 for KWH/KW meter test time

X = 0.5 for new CT test time

Total: **\$ 31,755**

III. Reinstall or retire without a Test:

Residential Meters:	2,000	Estimated Dollars:	\$16,984
Singlephase KWH/KW Meters:	400	Estimated Dollars:	\$ 5,095
Three Phase Meters:	400	Estimated Dollars:	\$ 5,944
Current Transformers:	100	Estimated Dollars:	\$ 636

JOINT RESPONSE OF THE UTILITIES:
INTERCOUNTY ENERGY COOPERATIVE, KENTUCKY
POWER COMPANY, KENTUCKY UTILITIES COMPANY,
LOUISVILLE GAS & ELECTRIC, OWEN ELECTRIC
COOPERATIVE, SHELBY ENERGY COOPERATIVE,
UNION LIGHT, HEAT & POWER COMPANY

Multiply by [X (estimated test time) x \$22 (estimated wages) X 1.93 (overhead rate)]:

X = 0.2 for residential meter test time

X = 0.3 for KWH/KW meter test time

X = 0.35 for Three Phase meter test time

X = 0.5 for CT test time

Total

\$ 28,659

IV. Reduction of Testing due to extended Test Frequencies:

Periodic Test Meters required in 1999 (Current Rules)

2,128 Meters

Periodic Test Meters required in 1999 (Pilot Rules)

968 Meters

Reduction in Tests

1,160 Meters

Multiply by [0.8 (estimated change out, test, and clerical time) X \$15
(estimated wages) X 1.93 (overhead rate)]:

\$ 26,856

Grand Total:

Approximately \$193,400 annually

JOINT RESPONSE OF THE UTILITIES:
INTERCOUNTY ENERGY COOPERATIVE, KENTUCKY
POWER COMPANY, KENTUCKY UTILITIES COMPANY,
LOUISVILLE GAS & ELECTRIC, OWEN ELECTRIC
COOPERATIVE, SHELBY ENERGY COOPERATIVE,
UNION LIGHT, HEAT & POWER COMPANY

REQUEST:

Provide the estimated savings, for each individual utility, for implementing the pilot meter-testing plan.

RESPONSE:

Kentucky Utilities Company
Annual Cost Saving Estimates for ANSI C12.1-1995 Implementation in Kentucky

I. Elimination of 25 year test rule:

Current Test Method

Residential Meters in Service: 440,000
Annual sample 4% 17,600

Institute a Sample Test Program based on a Scientific Method ANSI C12.1-1995

Approximate meters tested using ANSI Z1.9 2,000
Difference from above (17,600 - 2,000 tests) 15,600
Multiply by [0.5(estimated change out, test, and clerical time) x
\$20/hr (estimated wages) x 1.6 (overhead rate)]: **\$249,600**

II. Elimination of 100% Testing of New Meters by the Utility:

New Residential Meter Tests: 13,500 Estimated Dollars: \$ 86,400
New Singlephase KWH/KW Meter Tests: 250 Estimated Dollars: \$ 2,400
New CT Tests: 700 Estimated Dollars \$ 9,000

Multiply by [X (estimated test time) x \$20/hr (estimated wages) x 1.6 (overhead rate)]:
X = 0.2 for residential meter test time
X = 0.3 for KWH/KW meter test time
X = 0.4 for CT test time

Total: \$ 97,800

III. Reinstall or retire without a Test:

Residential Meters 7,000
Multiply by [0.25 (estimated test & clerical time) x
\$20/hr (estimated wages) x 1.6 (overhead rate)]: Estimated Dollars: **\$ 56,000**

IV. Polyphase Periodic Meter Testing:

Periodic tests required in 1999 (current rules) 3,100
Estimated periodic tests in 2000 (pilot rules) 2,300
Estimated reduction in tests 800
Multiply by [0.8 (estimated change out, test, clerical time) x
\$20/hr (estimated wages) x 1.6 (overhead rate)]: Estimated Dollars: **\$ 20,500**

V. Grand Total (I + II + III + IV): Approximately \$424,000 annually

WITNESS: Chuck Schram

JOINT RESPONSE OF THE UTILITIES:
INTERCOUNTY ENERGY COOPERATIVE, KENTUCKY
POWER COMPANY, KENTUCKY UTILITIES COMPANY,
LOUISVILLE GAS & ELECTRIC, OWEN ELECTRIC
COOPERATIVE, SHELBY ENERGY COOPERATIVE,
UNION LIGHT, HEAT & POWER COMPANY

REQUEST:

Provide the estimated savings, for each individual utility, for implementing the pilot meter-testing plan.

RESPONSE:

Louisville Gas & Electric Company
Annual Cost Saving Estimates for ANSI C12.1-1995 Implementation in Kentucky

I. Elimination of 25 year test rule:

Current Test Method

Residential Meters in Service:	340,000
Math Average (divide by 25):	13,600
Reduce by 15% (estimate of meters removed before 25 years):	11,560

Institute a Sample Test Program based on a Scientific Method ANSI C12.1-1995

Approximate meters tested using ANSI Z1.9	2,000
Difference from above (11,560 - 2,560 tests)	9,560
Multiply by [0.5 (estimated change out, test, and clerical time) x \$20/hr (estimated wages) x 1.6 (overhead rate)]:	\$153,600

II. Elimination of 100% Testing of New Meters by the Utility:

New Residential Meter Tests:	8,500	Estimated Dollars:	\$ 54,400
New Singlephase KWH/KW Meter Tests:	400	Estimated Dollars:	\$ 3,800
New CT Tests:	800	Estimated Dollars:	\$ 10,200

Multiply by [X (estimated test time) x \$20/hr (estimated wages) x 1.6 (overhead rate)]:

X = 0.2 for residential meter test time

X = 0.3 for KWH/KW meter test time

X = 0.4 for CT test time

Total: \$ 68,400

III. Reinstall or retire with a Test:

Residential Meters	3,000
Multiply by [0.25 (estimated test & clerical time) x \$20/hr (estimated wages) x 1.6 (overhead rate)]:	Estimated Dollars: \$ 24,000

IV. Polyphase Periodic Meter Testing:

Periodic tests required in 1999 (current rules)	3,700
Estimated periodic tests in 2000 (pilot rules)	3,200
Estimated reduction in tests	500
Multiply by [0.8 (estimated change out, test, clerical time) x \$20/hr (estimated wages) x 1.6 (overhead rate)]:	Estimated Dollars: \$ 13,000

V. Grand Total (I + II + III + IV): Approximately \$258,000 annually

WITNESS: Chuck Schram

JOINT RESPONSE OF THE UTILITIES:
INTERCOUNTY ENERGY COOPERATIVE, KENTUCKY
POWER COMPANY, KENTUCKY UTILITIES COMPANY,
LOUISVILLE GAS & ELECTRIC, OWEN ELECTRIC
COOPERATIVE, SHELBY ENERGY COOPERATIVE,
UNION LIGHT, HEAT & POWER COMPANY

REQUEST:

Provide the estimated savings, for each individual utility, for implementing the pilot meter-testing plan.

RESPONSE:

Cost Savings Estimates for Owen Electric

Elimination of testing new meters after factory test:

2000 meters per year @ \$5.00 ea. = \$10,000.00

Ability to retire without retest:

200 meters per year @ \$5.00 ea. = \$ 1,000.00

Return meter to service without retesting:

300 meters per year @ \$5.00 ea. = \$ 1,500.00

Increasing test intervals of three phase and C.T. rated meters:

40 meters per year @ \$80.00 ea. = \$ 3,200.00

Total \$15,700.00

WITNESS: Danny Stockdale

JOINT RESPONSE OF THE UTILITIES:
 INTERCOUNTY ENERGY COOPERATIVE, KENTUCKY
 POWER COMPANY, KENTUCKY UTILITIES COMPANY,
 LOUISVILLE GAS & ELECTRIC, OWEN ELECTRIC
 COOPERATIVE, SHELBY ENERGY COOPERATIVE,
 UNION LIGHT, HEAT & POWER COMPANY

REQUEST:

Provide the estimated savings, for each individual utility, for implementing the pilot meter-testing plan.

RESPONSE:

Annual Cost Savings for Sample Meter Testing Pilot Project for Shelby Energy Cooperative

Existing Sample Test Plan

Residential Meters in Service:	12,640
4% of Total Meters:	506
Cost per Meter to Change Out and Test:	\$21.00
Total:	\$10,626.00

ANSI Sample Testing Plan

Residential Meters in Service:	12,640
Meters to Test Using ANSI Z1.9:	210 (Minimum 30 Meters per Group)
Cost per Meter to Change Out and Test:	\$21.00
Total:	\$4,410.00

Annual Savings for Implementing ANSI Sample Test Plan: \$6,216.00

Elimination of Testing New Meters

New Residential Meters:	600 @ \$2.30	\$1,380.00
New Polyphase Meters:	10 @ \$10.00	\$ 100.00
Total:		\$1,480.00

Future Saving:

Polyphase Meter Testing	14 @ \$66.50	\$ 931.00
-------------------------	--------------	------------------

Annual Cost Savings for Sample Meter Testing Pilot Project: \$8,627.00

WITNESS: Dudley Bottom, Jr.

JOINT RESPONSE OF THE UTILITIES:
 INTERCOUNTY ENERGY COOPERATIVE, KENTUCKY
 POWER COMPANY, KENTUCKY UTILITIES COMPANY,
 LOUISVILLE GAS & ELECTRIC, OWEN ELECTRIC
 COOPERATIVE, SHELBY ENERGY COOPERATIVE,
 UNION LIGHT, HEAT & POWER COMPANY

REQUEST:

Provide the estimated savings, for each individual utility, for implementing the pilot meter-testing plan.

RESPONSE:

Cinergy/ULH&P
Annual Cost Saving Estimates for Five Year Pilot in Kentucky

I. Elimination of 25 year test rule:

Residential Meters in Service:		106,173
Math Average (divide by 25):	4,247	
Reduce by 45% (estimate of meters removed before 25 years):	3,610	

Institute a Sample Test Program based on a Scientific Method ANSI Z1.9-1993

Approximate meters using ANSI Z1.9	930 Meters
Difference (3,610 – 930)	2,680 Meters

Multiply by [0.8 (estimated change out, test, and clerical time) X
 \$17 (estimate wages) X 1.7 (overhead rate)]: **\$61,962**

II. Elimination of 100% Testing of New Meters:

New Residential Meter Tests:	3,000	Estimated Dollars:	\$20,400
New Singlephase KWH/KW Meter Tests:	500	Estimated Dollars:	\$ 4,080
New CT Tests:	500	Estimated Dollars:	\$ 6,800

Multiply by [X (estimated test time) X \$20 (estimate wages) X 1.7 (overhead rate)]:

X = 0.2 for residential meter test time

X = 0.3 for KWH/KW meter test time

X = 0.5 for new CT test time

Total: **\$31,280**

III. Reinstall or retire without a Test:

Residential Meters:	1,500	Estimated Dollars:	\$10,200
Singlephase KWH/KW Meters:	300	Estimated Dollars:	\$ 3,060
Three Phase Meters:	300	Estimated Dollars:	\$ 3,570
Current Transformers:	75	Estimated Dollars:	\$ 1,275

Multiply by [X (estimated test time) X \$20 (estimate wages) X 1.7 (overhead rate)]:

X = 0.2 for residential meter test time

X = 0.3 for KWH/KW meter test time

X = 0.35 for Three Phase meter test time

X = 0.5 for CT test time

Total: **\$18,105**

JOINT RESPONSE OF THE UTILITIES:
INTERCOUNTY ENERGY COOPERATIVE, KENTUCKY
POWER COMPANY, KENTUCKY UTILITIES COMPANY,
LOUISVILLE GAS & ELECTRIC, OWEN ELECTRIC
COOPERATIVE, SHELBY ENERGY COOPERATIVE,
UNION LIGHT, HEAT & POWER COMPANY

IV. Reduction of Testing due to extended Test Frequencies:

Periodic Test Meters required in 1999 (Current Rules)	732 Meters
Periodic Test Meters required in 1999 (Pilot Rules)	<u>500 Meters</u>
Reduction in Tests:	232 Meters

Multiply by [0.8 (estimated change out, test, and clerical time) X
\$20 (estimate wages) X 1.7 (overhead rate)]: **\$6,310**

Grand Total **Approximately \$120,000 annually**

WITNESS: Charlie Ploeger

JOINT RESPONSE OF THE UTILITIES:
INTERCOUNTY ENERGY COOPERATIVE, KENTUCKY
POWER COMPANY, KENTUCKY UTILITIES COMPANY,
LOUISVILLE GAS & ELECTRIC, OWEN ELECTRIC
COOPERATIVE, SHELBY ENERGY COOPERATIVE,
UNION LIGHT, HEAT & POWER COMPANY

REQUEST:

Provide the plan for early removal of the control group when its sample does not meet prescribed performance standards.

RESPONSE:

As stated in the Utilities' filing, Meter Testing Pilot Plan, Appendix A, pages 6 and 7, if a meter lot fails two consecutive years, the Commission shall be notified of the Utilities' action plan to resolve the problem. The individual company may choose to take action such as increase testing of the meters, or removal of the meters over a time period agreeable to the Commission. Utilities will actively test or change out poor performing meter lots until the meter lots sample test results improve or all meters have been corrected by either a test or a change.

WITNESS: See Appendix

JOINT RESPONSE OF THE UTILITIES:
INTERCOUNTY ENERGY COOPERATIVE, KENTUCKY
POWER COMPANY, KENTUCKY UTILITIES COMPANY,
LOUISVILLE GAS & ELECTRIC, OWEN ELECTRIC
COOPERATIVE, SHELBY ENERGY COOPERATIVE,
UNION LIGHT, HEAT & POWER COMPANY

REQUEST:

What is the anticipated largest control lot size? What is the smallest acceptable sample size?

RESPONSE:

Utility	Anticipated Largest Control Lot Size	Smallest Acceptable Sample Size
Inter County	7,000	30
Kentucky Power	70,000	150
Kentucky Utilities	128,433	150
Louisville Gas & Electric	102,000	150
Owen Electric Cooperative	15,000	200
Shelby Energy Cooperative	5,000	30
Union Light Heat & Power	17,800	100

WITNESS: See Appendix

JOINT RESPONSE OF THE UTILITIES:
INTERCOUNTY ENERGY COOPERATIVE, KENTUCKY
POWER COMPANY, KENTUCKY UTILITIES COMPANY,
LOUISVILLE GAS & ELECTRIC, OWEN ELECTRIC
COOPERATIVE, SHELBY ENERGY COOPERATIVE,
UNION LIGHT, HEAT & POWER COMPANY

REQUEST:

Explain and provide any written information that supports the elimination of the 25-year service life for the meters. What is the proposed service life in the plan?

RESPONSE:

Statistical data and trending is the best method to evaluate meter performance. The proposed sample plan will provide information that applies to all meters in a given test group, including those that have been in service in excess of 25 years.

As indicated in the Application, smoothing annual test volumes requires that utilities test 4% of the meter population each year. In practice, the 25-year rule creates a periodic override to a sample test plan. Establishment of narrow ANSI test groups along with the elimination of the 25-year rule will concentrate resources on replacing suspect metering equipment. Considerable resources are currently focused on testing large numbers of meters with outstanding historical performance. In general, adoption of an ANSI sample program will mean testing fewer meters out of more groups and result in an improved testing program at a lower cost.

The pilot plan does not have a service life for a meter. The service life would be based solely on how well the meter performs.

WITNESS: See Appendix

JOINT RESPONSE OF THE UTILITIES:
INTERCOUNTY ENERGY COOPERATIVE, KENTUCKY
POWER COMPANY, KENTUCKY UTILITIES COMPANY,
LOUISVILLE GAS & ELECTRIC, OWEN ELECTRIC
COOPERATIVE, SHELBY ENERGY COOPERATIVE,
UNION LIGHT, HEAT & POWER COMPANY

REQUEST:

What is the rationale for selecting inspection level II, and AQL of 2.5?

RESPONSE:

The Inspection Level II is the normal inspection level, not a tightened or reduced inspection level. The ANSI Z1.9 standard recommends using a normal inspection level. If a meter (or product) passes all sample analysis for a period of 10 or more sample periods, a reduced inspection is appropriate if acceptable to all parties. A tightened inspection level may be appropriate for failed lots in some cases, resulting in increased testing of a particular group.

The Inspection Level II and AQL of 2.5 are commonly used values for most 'in service' sample test plans. The AQL of 2.5 will assure that a minimum 98% of all in service meters are operating with + or - 2% of 100.00%.

WITNESS: See Appendix

JOINT RESPONSE OF THE UTILITIES:
INTERCOUNTY ENERGY COOPERATIVE, KENTUCKY
POWER COMPANY, KENTUCKY UTILITIES COMPANY,
LOUISVILLE GAS & ELECTRIC, OWEN ELECTRIC
COOPERATIVE, SHELBY ENERGY COOPERATIVE,
UNION LIGHT, HEAT & POWER COMPANY

REQUEST:

Refer to the Utilities application, page 6 of the Appendix A. Explain the rationale of establishing an additional lot when a sample of a control group fails the test?

RESPONSE:

The establishment of an additional lot when a sample of a control group fails the test is appropriate if further subdivision of the lot could result in added information. For example, assume a lot consists of 8,000 type XXX meters, with S/N range from 1 to 8,000. The sample lot fails but all poor performing meters have S/N's less than 4,000. It would be appropriate the next year to make two groups of XXX meters - group I with S/N's from 1 to 4,000 and group II with S/N's 4,001 to 8,000.

WITNESS: See Appendix

JOINT RESPONSE OF THE UTILITIES:
INTERCOUNTY ENERGY COOPERATIVE, KENTUCKY
POWER COMPANY, KENTUCKY UTILITIES COMPANY,
LOUISVILLE GAS & ELECTRIC, OWEN ELECTRIC
COOPERATIVE, SHELBY ENERGY COOPERATIVE,
UNION LIGHT, HEAT & POWER COMPANY

List of Witnesses

<u>Name</u>	<u>Company</u>
Stephen D. Souder	Inter County Energy Cooperative Corp.
Jack E. Carr	Kentucky Power Company d/b/a American Electric Power
Errol K. Wagner	Kentucky Power Company d/b/a American Electric Power
William Bosta	Kentucky Utilities Company/ Louisville Gas and Electric
Chuck Schram	Kentucky Utilities Company/ Louisville Gas and Electric
Danny Stockdale	Owen Electric Cooperative
Dudley Bottom, Jr.	Shelby Energy Cooperative
Michael A. Gribler	Union Light, Heat and Power Company
Charlie T. Ploeger	Union Light, Heat and Power Company



COMMONWEALTH OF KENTUCKY
PUBLIC SERVICE COMMISSION
730 SCHENKEL LANE
POST OFFICE BOX 615
FRANKFORT, KY. 40602
(502) 564-3940

December 29, 1999

To: All parties of record

RE: Case No. 1999-441

We enclose one attested copy of the Commission's Order in
the above case.

Sincerely,

A handwritten signature in cursive script that reads "Stephanie Bell".

Stephanie Bell
Secretary of the Commission

SB/hv
Enclosure

James L. Jacobus
President/CEO
Inter-County Energy Cooperative
Corporation
1009 Hustonville Road
P. O. Box 87
Danville, KY 40423 0087

Honorable William M. Dishman
Counsel for Inter County Energy
Silliman, Dishman & Nickels
P.O. Box 850
Danville, KY 40423 0850

Errol K. Wagner
Director of Regulatory Affairs
American Electric Power
1701 Central Avenue
P. O. Box 1428
Ashland, KY 41105 1428

Honorable Douglas M. Brooks
Senior Counsel Specialist, Reg.
Louisville Gas and Electric
Kentucky Utilities Company
220 West Main Street
Louisville, KY 40202

Ronald Willhite
Vice President Regulatory Affairs
Louisville Gas and Electric Company
220 W. Main Street
P. O. Box 32010
Louisville, KY 40232 2010

Honorable James M. Crawford
Counsel for Owen Electric
Crawford & Baxter, P.S.C.
Attorneys at Law
523 Highland Avenue
P.O. Box 353
Carrollton, KY 41008

Frank Downing
Manager
Owen Electric Cooperative, Inc.
510 South Main Street
P. O. Box 400
Owenton, KY 40359

Honorable Donald T. Prather
Counsel for Shelby Energy
Mathis, Riggs & Prather, P.S.C.
Attorneys at Law
500 Main Street
P.O. Box 1059
Shelbyville, KY 40065

Dudley Bottom
General Manager
Shelby Energy Cooperative, Inc.
620 Old Finchville Road
Shelbyville, KY 40065

Honorable John J. Finnigan
Senior Counsel
The Union Light, Heat & Power Co.
139 E. Fourth Street
25th Fl. Atrium II
Cincinnati, OH 45202

James B. Gainer
Legal Division
The Union Light Heat & Power Co
139 E. Fourth Street
Cincinnati, OH 45202

Honorable Mark R. Overstreet
Counsel for American Electric Power
Stites & Harbison
421 West Main Street
Post Office Box 634
Frankfort, KY 40602 0634

COMMONWEALTH OF KENTUCKY
BEFORE THE PUBLIC SERVICE COMMISSION

In the Matter of:

THE JOINT APPLICATION OF THE UTILITIES:)
INTER COUNTY ENERGY COOPERATIVE)
CORPORATION, KENTUCKY POWER COMPANY,)
D/B/A AMERICAN ELECTRIC POWER, KENTUCKY)
UTILITIES COMPANY, LOUISVILLE GAS AND)
ELECTRIC, OWEN ELECTRIC COOPERATIVE,)
SHELBY ENERGY COOPERATIVE, THE UNION) CASE NO. 99-441
LIGHT, HEAT AND POWER COMPANY)
COLLECTIVELY CALLED ("UTILITIES") FOR)
APPROVAL OF A PILOT METER TESTING PLAN)
PURSUANT TO 807 KAR 5:041, SECTIONS 13, 15,)
16, 17 AND 22)

O R D E R

IT IS ORDERED that the Utilities shall file the original and 10 copies of the following information with the Commission with a copy to all parties of record by January 21, 2000. Each copy should be placed in a bound volume with each item tabbed. When a number of sheets are required for an item, each sheet should be indexed appropriately. The Utilities shall furnish with each response the name of the witness who will be available to respond to questions concerning each item of information requested should a public hearing be scheduled.

1. If the Utility plans to have new meter devices tested by the manufacturer:
 - a. Provide information demonstrating that all requirements noted in 807 KAR 5:006, Section 16, will be met.

b. Provide information demonstrating that all requirements noted in 807 KAR 5:041, Section 14(1) & (2), will be met.

c. Will the Utilities sample test the new meters tested by the manufacturers?

(1) If yes, provide information regarding the type of sample testing of new metering devices the utility will perform. Specifically, what Acceptable Quality Levels ("AQL"), Lot Size, and Inspection Level would be used?

(2) If no, explain why.

d. Provide information demonstrating that all requirements noted in 807 KAR 5:006, Section 17(1)(a), will be met.

2. Provide, for each utility, the number of meters tested each year beginning with 1996. Indicate for each year whether the numbers represent testing under a periodic or an approved sample-testing program.

3. Refer to the Utilities' application, Appendix A, II (B)(3)(b). Explain why the acceptability criteria will be based on an upper limit of 102 percent and a lower limit of 98 percent instead of an upper limit of 101 percent and a lower limit of 99 percent.

4. Refer to the Utilities' application, Appendix A, II (D)(3)(b). Explain why the Utilities did not limit the lot size to a maximum of 10,000 meters.

5. Refer to the Utilities' application, Appendix A, II(C)(3). Explain why meters removed from service will not be tested.

6. Refer to the Utilities' application, Appendix A, III (B)(2). Explain why instrument transformers removed from service will not be tested.

7. Refer to the Utilities' application, Appendix A, III (A)(1). Explain why the performance of a mechanical or lagged demand register shall be acceptable when the error in demand registration does not exceed ± 4 percent instead of ± 2 percent.

8. How many electromechanical and ball/jewel bearing suspension meters are operated by each utility in 1999?

9. Is there an early removal program for the jewel bearing suspension meters? Explain.

10. Provide the criteria for segregating the meters into homogeneous control groups.

11. Provide criteria for combining control groups.

12. Refer to the joint application. The Utilities have requested several deviations from Commission regulations. Provide a list of the deviations requested and the rationale for requesting each one of them. Explain in detail.

13. Provide the estimated savings, for each individual utility, for implementing the pilot meter-testing plan.

14. Provide the plan for early removal of the control group when its sample does not meet prescribed performance standards.

15. What is the anticipated largest control lot size? What is the smallest acceptable sample size?

16. Explain and provide any written information that supports the elimination of the 25-year service life for the meters. What is the proposed service life in the plan?

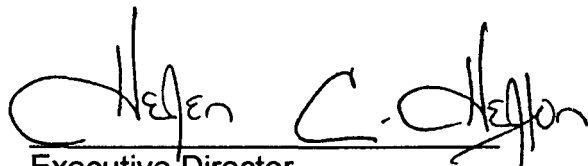
17. What is the rationale for selecting inspection level II, and AQL of 2.5?

18. Refer to the Utilities' application, page 6 of the Appendix A. Explain the rationale of establishing an additional lot when a sample of a control group fails the test.

Done at Frankfort, Kentucky, this 29th day of December, 1999.

By the Commission

ATTEST:


Executive Director



COMMONWEALTH OF KENTUCKY
PUBLIC SERVICE COMMISSION
730 SCHENKEL LANE
POST OFFICE BOX 615
FRANKFORT, KY. 40602
(502) 564-3940

November 2, 1999

To: All parties of record

RE: Case No. 99-441
INTER-COUNTY ENERGY COOPERATIVE CORPORATION
(Deviation) AEP, KU, LG&E, OWEN, SHELBY, ULH&P METER TESTING

This letter is to acknowledge receipt of initial application in the above case. The application was date-stamped received October 29, 1999 and has been assigned Case No. 99-441. In all future correspondence or filings in connection with this case, please reference the above case number.

If you need further assistance, please contact my staff at 502/564-3940.

Sincerely,

A handwritten signature in black ink that reads "Stephanie J. Bell".

Stephanie Bell
Secretary of the Commission

SB/sh

James L. Jacobus
President/CEO
Inter-County Energy Cooperative
Corporation
1009 Hustonville Road
P. O. Box 87
Danville, KY. 40423 0087

Honorable William M. Dishman,
Counsel for Inter County Energy
Silliman, Dishman & Nickels
P.O. Box 850
Danville, KY. 40423 0850

Errol K. Wagner
Director of Regulatory Affairs
American Electric Power
1701 Central Avenue
P. O. Box 1428
Ashland, KY. 41105 1428

Honorable Douglas M. Brooks
Senior Counsel Specialist, Reg.
Louisville Gas and Electric
Kentucky Utilities Company
220 West Main Street
Louisville, KY. 40202

Ronald Willhite
Vice President Regulatory Affairs
Louisville Gas and Electric Company
220 W. Main Street
P. O. Box 32010
Louisville, KY. 40232 2010

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Counsel for Owen Electric
Crawford & Baxter, P.S.C.
Attorneys at Law
523 Highland Avenue
P.O. Box 353
Carrollton, KY. 41008

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Manager
Owen Electric Cooperative, Inc.
510 South Main Street
P. O. Box 400
Owenton, KY. 40359

Honorable Donald T. Prather
Counsel for Shelby Energy
Mathis, Riggs & Prather, P.S.C.
Attorneys at Law
500 Main Street
P.O. Box 1059
Shelbyville, KY. 40065

Dudley Bottom,
General Manager
Shelby Energy Cooperative, Inc.
620 Old Finchville Road
Shelbyville, KY. 40065

Honorable John J. Finnigan,
Senior Counsel
The Union Light, Heat & Power Co.
139 E. Fourth Street
25th Fl. Atrium II
Cincinnati, OH. 45202

James B. Gainer
Legal Division
The Union Light Heat & Power Co
139 E. Fourth Street
Cincinnati, OH. 45202

Honorable Mark R. Overstreet
Counsel for American Electric Power
Stites & Harbison
421 West Main Street
Post Office Box 634
Frankfort, KY. 40602 0634

STITES & HARBISON

ATTORNEYS

October 29, 1999

Ms. Helen Helton
Executive Director
Public Service Commission of Kentucky
P.O. Box 615
Frankfort, KY 40602-0615

Re: ***Joint Application for Approval of Pilot Meter Testing Plan***


Dear Ms. Helton:

Case No. 99-441

Please accept for filing the Joint Application of Inter County Energy Cooperative Corporation, Kentucky Power d/b/a American Electric Power, Kentucky Utilities Company, Louisville Gas & Electric Company, Owen Electric Cooperative, Inc., Shelby Energy Cooperative, Inc. and The Union, Light, Heat and Power Company for approval of a pilot electric meter testing plan. The Joint Applicants seek approval to institute the pilot plan for a five year period beginning January 1, 2000.

If you have any questions, please do not hesitate to contact me or the other counsel signing the Joint Application.

Very truly yours,


Mark R. Overstreet

Enclosures

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102999

RECEIVED
OCT 29 1999
PUBLIC SERVICE
COMMISSION

421 West Main Street
Post Office Box 634
Frankfort, KY 40602-0634
(502) 223-3477
(502) 223-4124 Fax
www.stites.com

Mark R. Overstreet
(502) 209-1219
moverstreet@stites.com

RECEIVED

OCT 29 1999

PUBLIC SERVICE
COMMISSION

KENTUCKY PUBLIC SERVICE COMMISSION

Case No. 99-441

JOINT APPLICATION ON BEHALF OF

Inter County Energy Cooperative Corporation

Kentucky Power Company d/b/a American Electric Power

Kentucky Utilities Company

Louisville Gas and Electric

Owen Electric Cooperative, Inc.,

Shelby Energy Cooperative, Inc.

The Union Light, Heat and Power Company

PILOT METER TESTING PLAN

October 29, 1999

COMMONWEALTH OF KENTUCKY
BEFORE THE PUBLIC SERVICE COMMISSION

RECEIVED

OCT 29 1999

PUBLIC SERVICE
COMMISSION

In the Matter of:

THE JOINT APPLICATION OF THE UTILITIES:)
INTER COUNTY ENERGY COOPERATIVE CORP.,)
KENTUCKY POWER COMPANY, d/b/a AMERICAN)
ELECTRIC POWER, KENTUCKY UTILITIES COMPANY,)
LOUISVILLE GAS AND ELECTRIC, OWEN ELECTRIC)
COOPERATIVE, SHELBY ENERGY COOPERATIVE,)
THE UNION LIGHT HEAT AND POWER COMPANY)
COLLECTIVELY CALLED ("UTILITIES") FOR APPROVAL)
OF A PILOT METER TESTING PLAN PURSUANT TO)
807 KAR 5:041, SECTIONS 13, 15, 16, 17 and 22)

Case No. 99-441

JOINT APPLICATION

The Joint Applicants, Inter County Energy Cooperative Corporation, Kentucky Power Company d/b/a American Electric Power, Kentucky Utilities Company, Louisville Gas and Electric, Owen Electric Cooperative Inc., Shelby Energy Cooperative Inc., The Union Light, Heat and Power Company, (collectively hereinafter called "Utilities"), move the Public Service Commission of Kentucky pursuant to 807 KAR 5:041, Sections 13, 15, 16, 17 and 22, to approve the proposed Pilot Meter Testing Plan filed herewith in lieu of the meter tests procedures prescribed by the Commission in its regulation 807 KAR 5:041, Sections 13, 15, 16, and 17, respectively. The Utilities also request the Commission to approve each utility's plan for implementation. The Pilot Meter Testing Plan will be in effect for a five year period beginning January 1, 2000.

I. BACKGROUND

Meter accuracy regulations in Kentucky were developed many years ago and metering technology in the electric industry has changed significantly since the inception of these regulations. While the development of meter technology has resulted in improved meter accuracy and dependability, meter accuracy regulations have not been updated to be consistent with these technological advances. As a result, the Utilities believe that the institution of a pilot meter testing plan is appropriate at this time.

II. WHY USE A PILOT PROGRAM?

The Utilities recognize that the current regulations apply to all utilities, including gas, water and electric industries. Yet, the technological advances in electric metering exceed what has occurred in the gas and water industries. For example, metering technology advances in the electric industry have resulted in the use of electromechanical meters with magnetic suspensions and surge-proof magnets. Performance data indicate that meter accuracy is significantly improved compared to earlier generation ball/jewel bearing suspension meters.

The Pilot concept offers a method of evaluating whether the proposed deviation is beneficial to the Utilities and to their customers. The meter population will be sufficient to allow for a thorough and statistically reliable evaluation before a statewide rollout of revised regulations. Any required pilot program revision will be accomplished before the actual regulations change, so the Pilot offers additional flexibility for potential modifications.

III. DESCRIPTION OF PILOT METER TESTING PLAN

The Pilot program is based on American National Standard Code for Electricity Metering, ANSI C12.1-1995. The details of the Pilot Meter Testing Plan, as applicable to the Utilities, are attached in Appendix A. Identification of the utility-specific sample test groups, as well as the anticipated cost savings of the pilot, is provided in Appendices B through H. The Pilot plan establishes accuracy limits, test plans and inspection procedures for alternating-current revenue producing watt-hour meters. The purpose of the Pilot Plan is to enhance the ability to detect and remove, at the earliest possible date, any group of meters that does not meet prescribed performance standards.

The major components of the Pilot Meter Testing Plan are described below.

1. All new metering devices shall be 100% tested: Either by the manufacturer or by the utility.
2. Use of a statistical sampling plan that will allow the Utilities to target meters by narrowly defined "lots", resulting in a greater probability of detecting "bad meters".

3. Elimination of the 25 Year Rule.

Currently the Utilities are required to test every single-phase meter within 25 years. Smoothing annual test volumes requires that utilities test 4% of the meter population each year. In practice, the 25-year rule creates a periodic override to a

sample test plan. Establishment of narrow ANSI test groups along with the elimination of the 25-year rule will concentrate resources on improving the detection and replacing suspect metering equipment. Considerable resources are currently focused on testing large numbers of meters with outstanding historical performance. In general, adoption of an ANSI sample program will mean testing fewer meters out of more groups and result in an improved testing program at a lower cost.

4. Elimination of requirement to test meter after being removed.

Sample plans are based on the assumption that the selected sample accurately represents the parent population. A meter routinely removed from service for reasons other than sample testing or damage should perform no differently than the sample group. Reinstallation of these meters at a new location without a test closely parallels the way customers routinely change residences without a meter test. In the absence of physical damage it is assumed that the meter is performing like its parent population.

5. Extension for time intervals for testing certain metering equipment including instrument transformers and demand meters. These meters have historically realized high levels of accuracy.

IV. BENEFITS OF THE PILOT METER TESTING PLAN

The benefits of the Pilot Plan include increasing meter accuracy and dependability, as well as the control of meter operating costs. Accuracy will be enhanced by the annual testing of a scientifically drawn sample of meter groups. Meter groups that demonstrate substandard performance will be identified and removed earlier than under the existing testing program. The Utilities estimate that these programs will save the companies and their customers on average \$1,000,000 per year by the end of the pilot period. Meter replacement cost could offset savings during the initial pilot years since revised meter groupings will quickly identify poor performing meters.

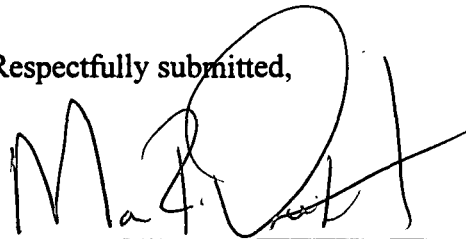
V. IMPLEMENTATION PLAN

The Utilities propose that the Pilot Plan be implemented beginning January 1, 2000. The Plan will remain in effect for five years. At the end of the fourth year, the Utilities will prepare an evaluation of the costs and benefits of the Pilot program and will submit a report to the Commission by July 1, 2004. At the end of each year, each utility will submit new sample test groups based on its then current meter population, if such changes are necessary.

VI. RECOMMENDATION

For reasons set forth above, the Utilities move the Commission to approve the Pilot Meter Testing Plan effective January 1, 2000.

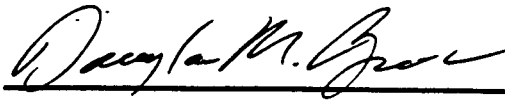
Respectfully submitted,

A handwritten signature in black ink, appearing to read "Mark R. Overstreet". The signature is written in a cursive style with a large, prominent loop for the letter "O" in "Overstreet".

Mark R. Overstreet
STITES & HARBISON
421 West Main Street
P. O. Box 634
Frankfort, Kentucky 40602
Telephone: (502)223-3477
COUNSEL FOR KENTUCKY POWER
COMPANY d/b/a AMERICAN ELECTRIC
POWER

William M. Dishman, Jr.

William M. Dishman, Jr.
SILLIMAN, DISHMAN AND NICKELS
P. O. Box 850
Danville, KY 40423-0850
Telephone: (606) 236-3757
COUNSEL FOR INTER COUNTY ENERGY
COOPERATIVE CORPORATION
1009 Hustonville Road
P. O. Box 87
Danville, KY 40422



Douglas M. Brooks
Senior Counsel Specialist, Regulatory
Louisville Gas and Electric
Kentucky Utilities Company
220 West Main Street
Louisville, KY 40202

Respectfully submitted,

CRAWFORD & BAXTER, P.S.C.
ATTORNEYS AT LAW
523 Highland Avenue
P.O. Box 353
Carrollton, Kentucky 41008
Phone: (502) 732-6688
Fax: (502) 732-6920

Counsel for Owen Electric Cooperative, Inc.

BY: James M Crawford
James M. Crawford

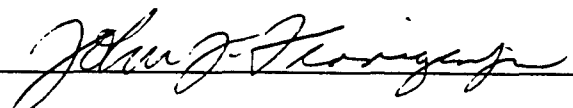


Donald T. Prather
MATHIS, RIGGS, & PRATHER, P. S. C.
Attorneys at Law
500 Main Street
P. O. Box 1059
Shelbyville, Kentucky 40065
Telephone: (502) 633-5220
COUNSEL FOR SHELBY ENERGY
COOPERATIVE, INC.

Mark R. Overstreet
STITES & HARBISON
421 West Main Street
P.O. Box 634
Frankfort, Kentucky 40602
Telephone: (502) 223-3477
COUNSEL FOR KENTUCKY POWER
COMPANY D/B/A AMERICAN ELECTRIC
POWER

COUNSEL FOR LOUISVILLE GAS &
ELECTRIC COMPANY

COUNSEL FOR KENTUCKY UTILITIES
COMPANY


COUNSEL FOR UNION LIGHT, HEAT &
POWER COMPANY

John J. Finnigan, Jr. (86657)
Senior Counsel
The Union Light, Heat & Power Company
139 E. Fourth Street, 25th Fl. Atrium II
Cincinnati, Ohio 45202
Phone: 513-287-3601

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APPENDIX A

METER TESTING PILOT PLAN

METER TESTING PILOT PLAN**I. New Metering Device Tests**

New metering devices shall be either 100% tested by the utility or 100% tested by the manufacturer.

II. Standards for In-Service Performance - Watthour Meters and Electronic Registers**A. Purpose**

1. This section shall establish accuracy limits, test plans and inspection procedures for alternating-current revenue watthour meters.
2. Watthour meters placed into service or returned to service shall meet the provisions set forth in this Section test plan.
3. All watthour meters and their associated equipment shall be thoroughly inspected at the time of installation to assure safe and accurate operation.

B. Accuracy Requirements**1. Testing Equipment and Standards**

- a. All working electronic watt-hour standards when regularly used shall be compared with a master standard every six months. Working watt-hour standards infrequently used shall be compared with a master standard before they are used.
- b. All working indicating instruments that affect the customer's quality of service shall be checked against master indicating instruments annually. If the working instrument is found appreciably in error at zero or in error by more than one (1) percent

of indication at commonly used scale deflections, it shall be adjusted. A calibration record shall be maintained for each instrument showing all pertinent data and name of person performing tests.

2. Test Loads

Full load shall be approximately 100% of test amperes at unity power factor, light load approximately 10% of test amperes at unity power factor and power factor 100% test amperes 50% lagging power factor. For meters used with current transformers, full load shall be approximately 100% of either meter test amperes or the secondary current rating of the current transformers; light load shall be approximately 10% of the selected full load current.

3. Acceptable Performance

The performance of all watt-hour meters is considered to be acceptable when the percent registration is not less than 98% or more than 102% as determined in paragraph D(5) of this section.

4. Adjustment Limits

Watt-hour meters shall be adjusted when the error in registration exceeds 1% at either light load or full load or when the error in registrations exceeds 2% at power factor. The registration of the watt-hour meter shall be adjusted within these limits as close to 100% as practical.

5. Acceptable Performance for Electronic Registers

The performance of a watthour meter with an electronic register when tested for other than kilowatthour registration shall be acceptable when the error measured does not exceed ± 2 of reading.

C. Tests

1. As-found Tests

As-found tests are done to determine the watthour meter accuracy before recalibration.

2. As-left Tests

As-left tests shall be conducted after all adjustments are completed and are in accordance with paragraph B(3) in this section.

3. Meters Removed from Service

Meters identified within this test plan may be removed from service and retired without test. Meters identified within this test plan may be returned to service without being tested.

D. Performance Tests

1. General

The performance of watthour meters should be verified by an annual test program such as one of the plans listed below. Records shall be maintained on each watthour meter tested. Subsequently, an analysis of the test results for each group of watthour meters shall be made and appropriate action shall be taken. The plans for testing are:

- a. Periodic Interval Plan
- b. Statistical Sampling Plan

2. Objectives

The primary purpose of performance testing is to provide information on which the utility may base a program to maintain meters in an acceptable degree of accuracy throughout their service life.

3. Test Plans

The Periodic Interval Plan is a schedule of testing for watthour meters at various set intervals. The Statistical Sampling Plan provides for the division of watthour meters into homogeneous groups. The annual selection process is random where each watthour meter within each group has an equal chance of being selected.

a. Periodic Interval Plan

The selected periodic interval for testing a watthour meter depends on the size of the service, complexity of the metering system, reliability of the type of watthour meter and/or manufacturer's recommendations. The plan listed below is a detailed periodic testing schedule by watthour meter and attachments:

Periodic Testing Schedule

	<u>Years Between Testing</u>
(1) Graphic Watthour Demand	2
(2) Electromechanical Watthour Meters without surge-proof magnets	8
(3) Thermal Lagged Demand Meters	16
(4) Magnetic Tape Demand Records	12
(5) Electromechanical Watthour Meters with surge-proof magnets and:	
(a) Mech KWH Register	16
(b) Mech Demand Registers	8-12
(c) Electronic Demand Register	16
(d) Mech Cam Pulse Initiator	2
(e) Mech Gear Shutter Pulse Initiator	8
(f) Electronic Pulse Initiator	12
(g) Electronic Remote Registers	8
(h) Electronic TOU Register	16
(6) Electronic Meter	16

b. Statistical Sampling Plan

The Statistical Sampling Plan used shall conform to accepted principles of statistical sampling based on either variables or attributes methods. Meters shall be divided into homogeneous groups, such as manufacturer and manufacturer's type. The groups may be further divided into subdivision within the manufacturer's type by major design modifications.

For example, the meters could be divided as follows:

Lot	Meter Type	Meter Population
I	J4S	25,678
II	I70S	22,567
III	D5S	28,908
IV	MS	29,765
V	J5S	23,568
VI	DXMX, MX	24,980

The number of meters to be selected in a Sample Test Plan shall be based on the American National Standard ANSI/ASQC Z1.9-1993. The performance of the meters will also be based on criteria within this standard.

The minimum quantity of meters pulled shall be based on Inspection Level II, AQL = 2.5, Table A-2 (see Attachment No. 1) and Table B-3 (see Attachment No. 2).

Lot performance shall be deemed acceptable if the full load performance of the meters within the lot meet the acceptability criteria of the ANSI/ASQC Z1.9-1993 based on an upper limit of 102% and a lower limit of 98% using Table B-3 (see Attachment No. 2).

If a lot fails, the utility must reevaluate by establishing an additional lot in the next year's sample program that consists only of the meter type that caused the lot to fail. If that lot fails again,

the Commission shall be notified of the Company's action to resolve the problem.

4. Test Records

The data to be recorded for the sample test plan shall include:

- (a) the number of meters in each group at the beginning of the test year
- (b) the number of meters tested
- (c) the analyzed test results

5. Determination of Billing Accuracy

The percentage registration of a watt-hour meter is, in general, different at light loads than at full loads, and may have still other values at other loads.

The determination of the average percentage registration of a watt-hour meter is not a simple matter, since it involves the characteristics of the meter and the loading. The accuracy of meters is more closely associated with the FL test accuracy for most loads since the LL accuracy is only representative of the meter's performance at a very small load conditions.

Average percentage registration is the weighted average of the percentage registration at light load (LL) and at full load (FL), giving the full load registration a weight of four:

$$\text{Weighted Percentage Registration} = \frac{4\text{FL} + \text{LL}}{5}$$

III. Mechanical and Thermal Demand Registers and Pulse Recorders

A. Accuracy Requirements

1. Acceptable Performance

The performance of a mechanical or lagged demand register shall be acceptable when the error in demand registration does not exceed ± 4 percent in terms of full-scale value when tested at any point between 50% and 100% of full-scale.

Under usual operating conditions, the performance of a pulse recording device shall be acceptable when the kilowatthours calculated from the pulse count do not differ by more than 2% from the corresponding kilowatthour meter registration.

2. Test Points

Mechanical or lagged demand registers should be tested at load Points or at above 50% of full scale.

3. Adjustment Limits

When a test of a mechanical or lagged demand register indicates that the error in registration exceeds that specified in paragraph A(1) in this section, the demand register shall be adjusted to within $\pm 2\%$ of full-scale value.

B. Instrument Transformers (Magnetic)

1. Pre-installation Tests

Prior to installation, all new instrument transformers shall be tested for voltage withstand, ratio correction factor, and phase angle. The tests shall be performed in accordance with the criteria established in IEEE C57.13.

2. Instrument Transformers Removed from Service

Instrument transformers removed from service can be retired or returned to service without further testing.

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

TABLE A-2²
Sample Size Code Letters¹

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	

¹Sample size code letters given in body of table are applicable when the indicated inspection levels are to be used.

²The 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.

Table B-3
Standard Deviation Method
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	Acceptable Quality Levels (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	↓	0.005	0.087	0.421	1.05	2.13	3.54	5.34	8.40	12.19	17.34	23.30	33.69	48.86	69.94	98.43	135.00
F	10	0.077	0.179	0.349	0.714	1.27	2.14	3.27	4.72	7.26	10.53	15.17	20.73	29.84	42.84	60.53	84.84	117.00
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	27.00	38.00	52.00	71.00	98.00
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	25.50	35.50	48.50	66.00	90.00
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	24.50	33.50	45.50	61.50	83.00
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	23.00	31.50	42.50	57.00	76.00
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	21.50	28.50	38.00	50.00	66.00
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	20.00	26.50	35.00	45.00	58.00
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	19.50	26.00	34.00	44.00	57.00
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	19.00	25.50	33.50	43.50	56.00
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	19.00	25.50	33.50	43.50	56.00
		.10	.15	.25	.40	.65	1.00	1.50	2.50	4.00	6.50	10.00						
		Acceptable Quality Levels (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 M value. When sample size equals or exceeds lot size, every item in the lot must be inspected.

APPENDIX B

INTER COUNTY ENERGY COOPERATIVE

Inter County Energy Figure 1

GROUP	MANUFACTURER	TYPE	TOTAL	SAMPLE
				SIZE
1	General Electric	I60	1070	30
2	General Electric	I70	1899	38
3	General Electric	I55, I55S, I50, I50S	368	30
4	Sangamo	J3S	856	30
5	Sangamo	J4S	5027	101
6	Sangamo	J5S	6886	138
7	Westinghouse	D4S	1902	38
8	Westinghouse	D5S	1015	21
9	ABB	AB1	1345	31
10	Duncan	MX	192	30
TOTAL			20560	487

NOTES

- 1). Initially, the sample size is 2% of the total population (min of 30).
- 2). The chart above is based on 1997 data used in initial application to PSC.
- 3). The total number of meters on the system include those meters in transition to and from the meter test shop.

APPENDIX C

**KENTUCKY POWER COMPANY
D/B/A
AMERICAN ELECTRIC POWER**

AEP Sample Test Groups for Kentucky Power

These test groups contain singlephase and network KWH only meters and KWH meters with frictionless, electronic registers or total electronic meters. Any meter that has a demand register that will cause 'drag' on the meter's disk shall not be included in a sample program and shall be tested as defined in Section D3 (a) of this pilot proposal.

Group Name	Meter Types	Installed	Sample Qnty.
I70S	I70S series	69,500	150
MS	MS series	31,262	100
J5S	J5S series	14,540	100
J4S	J4S series	15,786	100
D4S	D4S series	14,801	100
D5S	D5S series	5,272	75
GE	I60/I55/I50	4,000	75
J3S	J3S	1,233	50
MQS	MQS	317	20
S12S	S2S series	100	10
V62S	V62, V612S series	245	15
MX	MX series	2,789	50

APPENDIX D

KENTUCKY UTILITIES COMPANY

Sample Test Groups for Kentucky Utilities Company

These test groups contain singlephase and network KWH only meters and KWH with electronic registers or electronic meters. Any meter that has a demand register that will cause drag on the meter's disk shall not be included in a sample program and shall be tested as defined in Section D3 (a) of this proposal.

Group Name	Meter Type	In Service Population	Sample Quantity
I50	GE I50	4228	75
I55	GE I55	3963	75
I60	GE I60	41476	150
I70	GE I70	131350	150
V612	GE V612	887	35
V62	GE V62	383	20
DS	Westinghouse DS	712	35
D2	Westinghouse D2	1041	35
D3	Westinghouse D3	3654	75
D4	Westinghouse D4	43279	150
D5	Westinghouse D5	4515	75
TD	Westinghouse TD	1218	50
AB1	ABB AB1	13450	100
JM	Sangamo JM	1259	50
J2	Sangamo J2	2188	50
J3	Sangamo J3	15399	100
J4	Sangamo J4	30171	100
J5	Schlumberger J5	94020	150
S12S	Schlumberger S12	96	10
MF	Duncan MF	1398	50
MK	Duncan MK	1513	50
MQS	Duncan MQS	7052	75
MS	Duncan MS	48791	150
MSII	Landis & Gyr MSII	5077	75
MX	Landis & Gyr MX	12712	100
DXMS	Landis & Gyr DXMS	258	15
DXMX	Landis & Gyr DXMX	137	10

APPENDIX E

LOUISVILLE GAS & ELECTRIC

LG&E Sample Test Groups

The following test groups contain singlephase, network KWH only meters, and KWH meters with electronic registers or total electronic meters. Any meter that has a demand register that will cause 'drag' on the meter's disk shall not be included in a sample program and shall be tested as defined in Section D3 (a) of this pilot proposal.

Group Name	Meter Types	Installed	Sample Qnty.
I50	GE I50	2,859	50
I55	GE I55	3,000	50
DS	Westinghouse DS	1,337	50
J2	Sangamo J2	1,881	50
I60	GE I60	17,877	100
D2S	Westinghouse D2S	2,367	50
J3	Sangamo J3	6,624	75
MQS	Duncan MQS	1,024	35
D4	Westinghouse D4	19,373	100
J4	Sangamo J4	13,852	100
MS	Duncan MS	9,849	75
I70	GE I70	102,326	150
D5	Westinghouse D5	7,084	75
MSII	Landis & Gyr MSII	53,574	150
MX	Landis & Gyr MX	16,422	100
AB1	ABB AB1	287	20
J4ES	Schlumberger J4ES	343	20
J5	Schlumberger J5	72,931	150
C1S	Schlumberger C1S	22	4

APPENDIX F

OWEN ELECTRIC COOPERATIVE

Owen Electric

Single Phase Electric Meters Grouped by Age and Manufacturer

Manufacturer	Total No. of Active meters	Number Tested
Sangamo-old	1767	93
Sangamo-new	17,833	793
Westinghouse-old	1,503	74
Westinghouse-new	1,080	51
GE – old	704	35
GE – new	9,814	504
Landis & Gyr	5,099	241
ABB	1,809	93
	-----	-----
Total	39,609	1,884

Notes:

Old = meters older than 25 years

New = meters less than 25 years

APPENDIX G

SHELBY ENERGY COOPERATIVE

SHELBY ENERGY COOPERATIVE

SINGLE PHASE ELECTRIC METERS GROUPED BY AGE AND MANUFACTURER

<u>SAMPLE GROUP</u>	<u>MANUFACTURER</u>	<u>TYPE</u>	<u>SERIAL NUMBER</u>	<u># METERS IN GROUP</u>
1	ABB/WESTINGHOUSE	D4S	< 72 000 000	1343
2	ABB/ WESTINGHOUS	D5S	> 72 000 000	1010
3	DUNCAN/LANDIS & GYR		< 30 000 000	744
4	DUNCAN/LANDIS & GYR		> 30 000 000	1430
5	GENERAL ELECTRIC		ALL	1951
6	SANGAMO/SCHLUMBERGER	J4S	< 69 000 000	4279
7	SANGAMO/SCHLUMBERGER	J5S	> 69 000 000	1883

APPENDIX H

UNION LIGHT HEAT & POWER COMPANY

ULH&P Proposed Sample Test Groups

These test groups contain estimated single phase and network KWH only meters and KWH meter with frictionless, electronic registers or total electronic meters. Any meter that has a demand register that will cause 'drag' on the meter's disk shall not be included in a sample program and shall be tested as defined in Section D3 (a) of this pilot proposal.

Group Name	Meter Types	Installed	Sample Quantity
I70S	I70S series	15,125	100
MS	MS series	17,800	100
J5S	J5S series	13,400	100
J4S	J4S series	11,800	100
D3S	D2S/D3S	6850	75
D4S	D4S series	15,400	100
D5S	D5S series	5,662	75
I60	I60/I55/I50	7,875	75
J3S	J3S	5,150	75
MQS	MQS/MKS	7,675	75
S12S	S2S series	400	20
V612S	V612S series	525	35
Total		100,812	930