South Kentucky RECC
A Touchstone Energy® Cooperative

Allen Anderson, President & CEO

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August 13, 2010

Mr. Jeff Derouen:
Executive Director
Kentucky Public Service Commission
211 Sowder Blvd.
P.O. Box 615
Frankfort, KY 40602-0615

Hand Delivered

RE: Case No. 2010-00291

Dear Mr. Derouen:

Enclosed you will find an original and six (6) copies of the response to the Commission Staff's First Information Request on the Application of South KY RECC's Deviation from its Testing of Meters Occasioned by Implementation of its Advance Metering Infrastructure System.

If I can be of any further assistance, please contact me at 606-678-4121.

Sincerely,

Stephen Johnson
Vice President of Finance
South KY RECC

jw Enclosures

# RESPONSE TO PSC FIRST INFORMATION REQUEST

Q 1. Refer to page 2 of South Kentucky's Application. South Kentucky states that the cost for testing its meters is $3.00 per meter tested.

a. Explain in detail the basis for the $3.00-per-meter tested amount.

b. Explain in detail whether South Kentucky does its own meter testing or if it employs an outside meter-testing facility to conduct its meter testing.

R 1(a). The $3.00 per meter cost is based on a quote from Luthan an outside meter-testing-facility.

R 1(b). South Kentucky RECC does both.

# RESPONSE TO PSC FIRST INFORMATION REQUEST

Q 2. Refer to page 1 of the Application, in which South Kentucky references the Commission's approval of South Kentucky's request to install an Advanced Metering Infrastructure ("AMI") system in Case No. 2009-00489.

a. Explain in detail whether South Kentucky has begun the installation of AMI meters under the program approved by the Commission in Case No. 2009-00489.
   (1) If yes, how many AMI meters have been installed to date?
   (2) If yes, what is South Kentucky currently doing with the old meters that have been replaced by AMI meters?
   (3) If yes, has South Kentucky tested any of the old meters or the AMI meters? Explain.

b. What is South Kentucky's current schedule for completing the installation of its AMI system, including the 69,300 AMI meters referenced in the Application?

R 2(a). Yes, South Kentucky currently has completed installation of AMI Meters on 4 substations and 3 circuits out of another substation. South Kentucky has the internal substation work started on an additional 10 substations with the conduit work completed on 16 more substations.

(1). 6,600

(2). Currently the old meters are being sent to an outside meter-testing-facility for testing and storage for two years.

(3). We have test results for approximately 2,000 old meters and using the factory test results for new AMI meters. We have not tested any AMI meters to date.

R 2(b). South Kentucky plans on having all meters installed by year end 2012. See Item No. 2 page 2 of 2.

# SKRECC AMI deployment schedule

| services | sub | name | Projected Start Date |
|---|---|---|---|
| 2134 | 6 | E. Somerset | 5/17/2010 |
| 2157 | 7 | Shopville | 6/15/2010 |
| 589 | 16 | Mt. Victory | 7/8/2010 |
| 1456 | 23 | Cabin Hollow | 7/15/2010 |
| 1324 | 5 | Somerset | 8/1/2010 |
| 45 | 20 | Asahi | 8/15/2010 |
| 1850 | 4 | Mt. Olive | 8/15/2010 |
| 983 | 29 | Cemetery Rd. | 9/8/2010 |
| 1900 | 9 | Floyd | 9/21/2010 |
| 1869 | 24 | S. Floyd | 11/1/2010 |
| 1522 | 8 | Norwood | 11/21/2010 |
| 1428 | 37 | Woodstock | 12/8/2010 |
| 1273 | 32 | Nelson Valley | 12/21/2010 |
| 4369 | 15 | Bronston | 1/7/2011 |
| 1951 | 25 | S. Oakhill | 3/1/2011 |
| 1450 | 19 | Oakhill | 4/1/2011 |
| 1967 | 21 | W. Somerset | 4/21/2011 |
| 2342 | 3 | Nancy | 5/15/2011 |
| 656 | 33 | Zolicoffer | 6/15/2011 |
| 1500 | 39 | Jabez | 6/21/2011 |
| 1866 | 34 | Gap of the Ridge | 7/8/2011 |
| 1781 | 14 | Monticello | 8/1/2011 |
| 2867 | 27 | Slat | 8/21/2011 |
| 1697 | 13 | Zula | 10/1/2011 |
| 3570 | 38 | Homestead | 10/21/2011 |
| 800 | 40 | Gregory Rd. | 12/8/2011 |
| 1853 | 12 | Sewellton | 12/21/2011 |
| 2941 | 1 | Russell Springs | 1/15/2012 |
| 1483 | 30 | Jamestown | 2/21/2012 |
| 1716 | 2 | Windsor | 3/7/2012 |
| 1891 | 22 | Salem | 4/1/2012 |
| 1500 | 36 | Webb's X-rds. | 4/21/2012 |
| 3171 | 11 | S. Albany | 5/8/2012 |
| 1508 | 10 | N. Albany | 6/15/2012 |
| 646 | 26 | Snow | 7/1/2012 |
| 2165 | 35 | Upchurch | 7/8/2012 |
| 1818 | 17 | Whitley City | 8/8/2012 |
| 3450 | 31 | Wiborg | 9/1/2012 |
| 2515 | 18 | Pine Knot | 10/15/2012 |
| 613 | 28 | E. Pine Knot | 11/15/2012 |
| | | completion of installation | 11/21/2012 |

72616 Total Services
69300 Estimated Number of active Services
3316 Estimated Inactive Services

# RESPONSE TO PSC FIRST INFORMATION REQUEST

Q 3. Refer to pages 2-3 of the Application, in which South Kentucky proposes to implement a sample meter-testing program whereby it would store the meters that it replaces with AMI meters for a period of two years. Explain in detail how South Kentucky proposes to implement the storage of old meters until they would be tested under the proposal advanced in the Application.

R 3. The old meters will be inventoried, indexed and held in a warehouse for a period of two years until a situation arises that would require the old meter to be pulled from the warehouse and tested to insure its accuracy.

# RESPONSE TO PSC FIRST INFORMATION REQUEST

Q 4. Refer to pages 2-3 of the Application, in which South Kentucky proposes to test only those replaced meters "with a 2% deviation from the AMI meters."

a. Explain in detail the basis for the proposal to test only those meters with a 2 percent deviation from the new AMI meters.
b. What time interval is South Kentucky proposing to use as a comparison between the readings from an old meter with the readings from a new AMI meter, e.g., is the comparison on a year-to-year basis, month-to-month basis, etc.?
c. Would the 2 percent deviation be based on actual usage, or would the readings be adjusted to account for weather variances from time period to time period?
d. How many meters does South Kentucky estimate it would have to test under the proposed program?

R 4(a). South Kentucky currently tests meters based on our sample-meter-testing plan, at request of a member or when removed from service. See Attached Item No. 5 Page 7 of 26.

When meters are removed from service it maybe the result of discontinuous of service or if South Kentucky feels that the meter reading did not meet the monthly pre-bill edit parameters as follows:

Account in demand file has no reading posted.
Demand usage 25% less than last month.
Demand usage 25% more than last month.
Demand usage 50% less than the same month last year.
Demand usage 50% more than the same month last year.
Bill amount exceeds maximum in rate table.
Bill amount less than minimum in rate table.
Days of service exceeds 60.
Bill amount greater than double last month.
Kwh usage is less than one third last month.
Kwh usage is 50% more than the same month last year.
Kwh usage is 50% less than the same month last year.
Days of service less than 25.
Max billing rate.
Change to rate/class.

# RESPONSE TO PSC FIRST INFORMATION REQUEST

If any of these items occur then we do inquires with the customer and see if anything may have changed with their usage for the service and if not then we pull the meter and have it tested to help insure the recorded readings are correct. This process catches the majority of meters which maybe recording improperly. Then after testing and if the meter test + or – 2% adjustments are made to customer accounts.

R 4(b). As set out in the pre-bill edit parameters. As stated in the reponse to 4(a).

R 4(c). The 2 percent deviation is the result from the actual guidelines used when testing meters.

R 4(d). SKRECC's current meter testing program see Attached Item No. 5 pages 7 thru 26 currently test on average approximately 1,100 meters. SKRECC is not at this time requesting a change to the sample meter testing plan. SKRECC is however requesting that all Class 200 and Class 320 residential type meters changed as a result of the installation on the new AMI meters not be tested pursuant to section 16 (SKRECC is requesting clarification of our interpretation of section 15.3 along with section 16). SKRECC is further requesting that SKRECC be allowed to deviate from their sample meter testing plan for the AMI meters that are replacing the Class 200 and Class 320 residential type meters from May 17, 2010 (AMI meter installation start date) – November 21, 2012 or the actual final installation date. Once installation is complete SKRECC will resume SKRECC's sample meter testing plan as approved by the Public Service Commission dated August 18, 1982.

# RESPONSE TO PSC FIRST INFORMATION REQUEST

Q 5. In Case No. 2010-00034, the Commission approved a request by Kenergy Corp. for authority to adopt a scientific sample meter-testing plan for single phase meters in accordance with the American National Standard ANSI/ASQC Z1.9-2003. A copy of the Commission's May 14, 2010 final Order in Case No. 2010-00034 is attached hereto. Explain in detail whether it would be feasible for South Kentucky to adopt a scientific sample meter-testing plan for its single-phase meters in accordance with American National Standard ANSI/ASQC Z1.9-2003, as opposed to the meter-testing plan proposed in its Application.

R 5. South Kentucky is currently utilizing a sample meter test plan and is asking for suspension of its meter testing program from 5/17/2010 to 11/21/2012 or the actual final installation date.

South Kentucky attaches our Sample Meter Testing Plan and a 10 year Summary of Sample Meter Testing-Plan as Item No. 5 pages 2 thru 26.

South Kentucky RECC
10 Year Summary of Sample Meter Testing Program

| Year | Group | # Meters | <=-2 | <-1.5>-2 | <-1>-1.5 | -1 | -.9 | -.8 | -.7 | -.6 | -.5 | -.4 | -.3 | -.2 | -.1 | 0 | +.1 | +.2 | +.3 | +.4 | +.5 | +.6 | +.7 | +.8 | +.9 | +1 | >1<1.5 | >1.5<2 | >=2 | % greater than +-2% | % within +-2% |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2000 | 4 | 50 | | 2 | 1 | | 1 | 1 | | | 2 | 3 | 5 | | 3 | 1 | 5 | 2 | 5 | 7 | 3 | 2 | 1 | | | 1 | 4 | 1 | | 0.33 | 99.67 |
| 2000 | 5 | 138 | | 5 | 3 | 2 | 1 | 6 | 2 | 2 | 9 | 7 | 11 | 18 | 13 | 9 | 9 | 12 | 11 | 2 | 6 | 3 | 1 | | 1 | 2 | 3 | | | 0.12 | 99.88 |
| 2000 | 6 | 475 | 1 | 5 | 2 | 2 | 6 | 5 | 3 | 17 | 24 | 32 | 41 | 57 | 54 | 35 | 26 | 36 | 26 | 39 | 13 | 14 | 4 | 7 | 8 | 6 | 11 | 1 | | 0 | 100 |
| 2000 | 7 | 343 | | | | 1 | 5 | 7 | 14 | 14 | 20 | 32 | 31 | 49 | 49 | 30 | 25 | 25 | 20 | 5 | 7 | 5 | 2 | 1 | 1 | | | | | 0 | 100 |
| 2000 | 8 | 50 | | 1 | 4 | 1 | 2 | 3 | | 1 | | 4 | 4 | 4 | | 6 | 4 | 2 | 1 | 2 | 1 | 2 | 4 | 1 | 1 | | 2 | | | 0 | 100 |
| | **Total** | **1056** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2001 | 5 | 130 | | 10 | 5 | 3 | 1 | 6 | 2 | 1 | 5 | 5 | 5 | 3 | 7 | 11 | 11 | 8 | 6 | 10 | 10 | 3 | 6 | 1 | 1 | 2 | 6 | 2 | | 0.97 | 99.03 |
| 2001 | 6 | 467 | 1 | | 3 | 3 | 5 | 4 | 16 | 16 | 21 | 27 | 26 | 37 | 43 | 66 | 47 | 36 | 37 | 17 | 14 | 18 | 13 | 7 | 3 | 4 | 1 | 1 | 1 | 0 | 100 |
| 2001 | 7 | 342 | 1 | 2 | | 5 | 6 | 6 | 9 | 12 | 19 | 28 | 22 | 34 | 31 | 35 | 43 | 27 | 24 | 18 | 8 | 7 | 3 | 2 | | | | | | 0 | 100 |
| 2001 | 8 | 50 | | | 2 | 3 | | 2 | 2 | 3 | 1 | 2 | 2 | | 1 | 4 | 3 | | 4 | 6 | 2 | 4 | 3 | 1 | 1 | 2 | 1 | 1 | | 0.29 | 99.71 |
| | **Total** | **989** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2002 | 5 | 50 | | | 1 | 1 | 1 | 4 | 3 | 3 | 4 | 2 | 2 | 3 | 8 | 5 | 3 | 4 | 3 | 1 | 1 | | | | 1 | | | | | 0.42 | 99.58 |
| 2002 | 6 | 392 | | 2 | 6 | 2 | 5 | 4 | 8 | 15 | 21 | 25 | 27 | 49 | 38 | 48 | 47 | 23 | 18 | 13 | 10 | 10 | 6 | 3 | 1 | 2 | 8 | 1 | | 0 | 100 |
| 2002 | 7 | 424 | | 2 | 2 | 4 | 4 | 6 | 9 | 14 | 25 | 27 | 55 | 54 | 43 | 57 | 44 | 27 | 22 | 14 | 8 | 3 | 2 | | | | 1 | 1 | | 0 | 100 |
| 2002 | 8 | 50 | | | 2 | 1 | 1 | 3 | 1 | 1 | 1 | 4 | 2 | | 1 | 3 | 3 | 3 | 3 | 6 | 4 | 1 | 1 | 2 | 2 | 1 | 2 | 2 | | 0.33 | 99.67 |
| | **Total** | **916** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2003 | 1 | 88 | | 1 | 8 | 3 | 4 | 6 | 4 | 3 | 9 | 8 | 2 | 5 | 3 | 5 | 6 | 5 | 5 | 1 | | | 1 | 5 | 4 | | | | | 0.56 | 99.44 |
| 2003 | 2 | 572 | 1 | | 4 | 1 | 6 | 11 | 16 | 32 | 24 | 42 | 59 | 62 | 60 | 55 | 65 | 43 | 26 | 21 | 21 | 6 | 6 | 4 | 6 | | 1 | | | 0.38 | 99.62 |
| 2003 | 3 | 485 | | | 2 | 1 | 10 | 5 | 13 | 26 | 32 | 38 | 40 | 64 | 61 | 55 | 37 | 43 | 15 | 9 | 10 | 7 | 3 | 1 | 10 | | 2 | 1 | | 0.35 | 99.65 |
| 2003 | 4 | 50 | | | 3 | 2 | | 2 | 1 | 5 | 5 | 3 | 4 | 5 | 5 | 2 | 3 | 2 | 1 | 2 | 3 | 2 | | | | | | | | 0.66 | 99.34 |
| | **Total** | **1195** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2004 | 1 | 69 | | | | | 1 | 2 | | 4 | 6 | 8 | 8 | 12 | 8 | 7 | 6 | 3 | 1 | | 2 | | | | 1 | | | | | 0.28 | 99.72 |
| 2004 | 2 | 624 | | 2 | 10 | 6 | 22 | 23 | 20 | 38 | 38 | 50 | 56 | 60 | 75 | 41 | 44 | 37 | 30 | 18 | 8 | 11 | 10 | 2 | 22 | | 1 | | | 0.41 | 99.59 |
| 2004 | 3 | 479 | | | | | | 1 | 1 | 12 | 18 | 65 | 65 | 66 | 67 | 54 | 42 | 32 | 26 | 7 | 12 | 7 | 1 | 1 | | | 2 | | | 0.29 | 99.71 |
| 2004 | 4 | 50 | | | 1 | 2 | 3 | 1 | 3 | 1 | 6 | 3 | 6 | 3 | 4 | 1 | 3 | 3 | 2 | | | 2 | 2 | | 3 | | 1 | | | 0.48 | 99.52 |
| | **Total** | **1222** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2005 | 1 | 64 | | | 1 | 1 | | 1 | 4 | 5 | 3 | 3 | 5 | 4 | 4 | 7 | 5 | 6 | 7 | 1 | 2 | 1 | 1 | 1 | | | 2 | | | 0.49 | 99.51 |
| 2005 | 2 | 656 | | | 5 | 12 | 15 | 15 | 25 | 29 | 42 | 56 | 70 | 71 | 68 | 51 | 54 | 34 | 30 | 16 | 18 | 13 | 9 | 5 | 15 | | 3 | | | 0.4 | 99.6 |
| 2005 | 3 | 470 | | 1 | 17 | 8 | 7 | 16 | 17 | 30 | 32 | 36 | 53 | 47 | 57 | 33 | 44 | 27 | 19 | 14 | 3 | | | 1 | 7 | | | 1 | | 0.39 | 99.61 |
| | **Total** | **1190** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2006 | 1 | 50 | | 1 | 1 | | 1 | 2 | 1 | 1 | 2 | 3 | 4 | 3 | 4 | 5 | 9 | 2 | 1 | 3 | | 1 | 2 | 2 | 1 | | 1 | | | 0.56 | 99.44 |
| 2006 | 2 | 701 | | | | | 1 | | 2 | 3 | 5 | 4 | 11 | 83 | 210 | 241 | 127 | 7 | 3 | 1 | 1 | 1 | | | 1 | | | | | 0.13 | 99.87 |
| 2006 | 3 | 465 | | | | | | 2 | 1 | | | 2 | 8 | 27 | 127 | 161 | 130 | 3 | 2 | 2 | | | | | | | | | | 0.12 | 99.88 |
| | **Total** | **1216** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2007 | 1 | 50 | | 1 | 4 | 1 | 2 | 3 | 2 | | 4 | 2 | 3 | 5 | 5 | 1 | 5 | 2 | 2 | 2 | 1 | | 3 | | 2 | | | | | 0.56 | 99.44 |
| 2007 | 2 | 724 | 1 | 2 | 5 | 5 | 8 | 13 | 14 | 26 | 41 | 56 | 94 | 85 | 100 | 74 | 71 | 49 | 27 | 21 | 10 | 5 | 3 | 1 | 8 | | 1 | 3 | 1 | 0.43 | 99.57 |
| 2007 | 3 | 445 | | | 1 | | 4 | 8 | 5 | 17 | 22 | 36 | 63 | 61 | 71 | 54 | 39 | 35 | 12 | 8 | 2 | 2 | 1 | | 4 | | | | | 0.28 | 99.72 |
| | **Total** | **1219** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2008 | 1 | 50 | | | | | | 2 | 4 | 3 | | 3 | 3 | 5 | 11 | 7 | 5 | 2 | 1 | 1 | 2 | 1 | | | | | | | | 0.34 | 99.66 |
| 2008 | 2 | 750 | 1 | 2 | 9 | 6 | 5 | 13 | 23 | 28 | 42 | 53 | 50 | 71 | 90 | 90 | 72 | 73 | 32 | 36 | 27 | 10 | 3 | 3 | 5 | 1 | 3 | 2 | | 0.47 | 99.53 |
| 2008 | 3 | 424 | 1 | | 10 | 3 | 8 | 10 | 16 | 18 | 28 | 37 | 37 | 52 | 50 | 45 | 43 | 20 | 14 | 13 | 5 | 3 | 2 | 1 | 8 | | | | | 0.41 | 99.59 |
| | **Total** | **1224** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2009 | 1 | 50 | | | | | | | | 1 | 2 | 1 | 3 | 8 | 2 | 9 | 7 | 7 | 4 | 2 | 4 | | | | | | | | | 0.26 | 99.74 |
| 2009 | 2 | 366 | 1 | | 2 | | 3 | 5 | 8 | 23 | 11 | 22 | 33 | 32 | 47 | 42 | 39 | 37 | 22 | 10 | 10 | 6 | 4 | 3 | 3 | | 3 | | | 0.51 | 99.49 |
| 2009 | 2-I | 438 | | | | | | | | | | 1 | 5 | 30 | 129 | 157 | 103 | 12 | 1 | | | | | | | | | | | 0.1 | 99.9 |
| 2009 | 3 | 401 | | | 6 | 2 | 4 | 13 | 19 | 22 | 28 | 39 | 46 | 45 | 53 | 41 | 32 | 16 | 15 | 9 | 5 | 1 | 1 | | 4 | | | | | 0.34 | 99.56 |
| | **Total** | **1255** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| **10 Year Total** | | **11482** | 8 | 39 | 120 | 81 | 142 | 211 | 268 | 426 | 552 | 769 | 961 | 1214 | 1602 | 1548 | 1261 | 705 | 478 | 337 | 233 | 151 | 98 | 55 | 124 | 21 | 59 | 17 | 2 | | |
| **10 Year % of Total** | | | 0.0007 | 0.0034 | 0.0105 | 0.0071 | 0.0124 | 0.0184 | 0.0233 | 0.0371 | 0.0481 | 0.067 | 0.0837 | 0.1057 | 0.1395 | 0.1348 | 0.1098 | 0.0614 | 0.0416 | 0.0294 | 0.0203 | 0.0132 | 0.0085 | 0.0048 | 0.0108 | 0.0018 | 0.0051 | 0.0015 | 0.0002 | | |

COMMONWEALTH OF KENTUCKY

BEFORE THE PUBLIC SERVICE COMMISSION

* * * * *

In the Matter of:

| | | |
|---|---|---|
| REQUEST BY SOUTH KENTUCKY R.E.C.C. FOR PERMISSION TO ADOPT A SAMPLE METER TEST PLAN | ) ) ) | CASE NO. 8536 |

O R D E R

South Kentucky Rural Electric Cooperative ("South Kentucky") by letter received May 24, 1982, applied for permission to institute a sample meter testing plan for single phase electric meters in lieu of the periodic meter tests required by the Commission's regulation 807 KAR 5:041, Section 15. South Kentucky filed its sample meter testing plan with its original request and filed additional information on August 6, 1982, in response to a staff request which was made following an on-site inspection of its meter testing facilities.

The Public Service Commission, after consideration of the request and all evidence of record and being advised, is of the opinion and finds that:

1. The Commission's regulation, 807 KAR 5:041, Section 16, permits a utility desiring to adopt a sample meter testing plan to submit its application to the Commission for approval.

2. South Kentucky will realize significant savings in meter test expense if sample meter testing is adopted. The estimated number of meters that would be tested if the existing

periodic testing plan were continued in 1983 would be 5,950 meters at total cost of $146,905 while the estimated number of meters that would be tested in 1983 if the sample meter testing plan were adopted would be 2,890 meters at a total cost of $71,354, a savings of approximately $75,551.

3. The adoption of a sample meter testing plan will not diminish the level of accuracy of the meters or the quality of service to the consumers.

4. The adoption of a sample meter testing plan as proposed by South Kentucky is in the public interest and should be granted.

IT IS THEREFORE ORDERED that South Kentucky be and it hereby is granted permission to adopt the sample meter testing plan described in exhibit I of the application and which is attached as an Appendix to this Order.

IT IS FURTHER ORDERED that South Kentucky shall have the periodic meter testing plan on schedule before initiating the sample meter testing plan.

IT IS FURTHER ORDERED that South Kentucky shall continue to test meters in accordance with the requirements of 807 KAR 5:006, Section 19, and 807 KAR 5:041, Section 15(3).

IT IS FURTHER ORDERED that South Kentucky shall make an annual report to the Commission showing the results of the sample meter testing plan in addition to the quarterly meter test reports which are now required.

Done at Frankfort, Kentucky, this 18th day of August, 1982.

PUBLIC SERVICE COMMISSION

Chairman

Vice Chairman

Commissioner

ATTEST:

Secretary

APPENDIX TO
CASE NO. 8536

EXHIBIT

# STATISTICAL

# SAMPLE TESTING PLAN FOR SINGLE PHASE

# ELECTRIC METERS

SOUTH KENTUCKY RECC
SOMERSET, KENTUCKY

In considering a sample testing plan for single phase electric watt-hour meters in Kentucky, some factors other than purely statistical must be taken into account. Specifically, the requirements of the Public Service Commission rules must be integrated into the plan to insure compliance with the rules as well as to provide a plan which will be statistically sound, economical, and effective in providing the necessary standards of service to the customer.

In particular the rules state:

1) Periodic sampling plans apply only to single phase meters.
2) No meter may remain in service without testing longer than 25 years.
3) All meters must be tested at 50% power factor when tested in the shop where facilities for this test are available.
4) The overall accuracy of meters for refund and back billing purposes is obtained by averaging the percent accuracy at full load and light load.

Obviously, these and other Commission rules will have some effect on the nature of the sampling plan. i.e.:

Provision number 4: While averaging the full load (FL) and light load (LL) accuracies is permitted and valid in terms of refunding and back billing, its use exclusively in statistical evaluation of test data will obscure much information about meter performance under different load conditions. Various kinds of meters exhibit marked variations in registration particularly at light load. Therefore it is considered desirable to plot and evaluate data at full load, light load and average load.

Provision number 2: South Kentucky proposes to test as a sample* 2% of the single phase self-contained meters on active accounts in each group (not less than 50 meters). These meters will come from meters that have been on accounts in excess of 7 years.

The results of this sample would then be applied to the table (section 16 paragraph (4) (a)) to determine the number of meters in addition to the sample to be taken from those meters in each group longest in service (our intention is to test a minimum of 4%).

This would allow South Kentucky to test more of the meters that have been in service longest than if we pulled a 4% sample.

Example: 4% of 35,000 = 1400 meters to be drawn at random from all meters in service in excess of 7 years. 2% of 35,000 = 700 meters (sample) to be drawn at random from all meters in service in excess of 7 years with 2% (700) to be drawn from those meters in service the longest.

We feel that this plan would keep our meters in better condition due to the percentage being pulled from those in service longest.

Most sampling plans which are considered in regard to meters are based on the Gaussian or "normal" distribution. The statistics derived from the curve, i.e. $\bar{X}$ "Bar-X", and "sigma", $\sigma$ once known, completely describe the curve. In other words, if $\bar{X}$ and sigma are known the curve can be reproduced. $\bar{X}$ is the arithmetic mean, and sigma is the standard deviation. The first is a measure of central tendency and the later is a measure of the dispersion of the data about the mean.

In order for these statistics to be valid and useful the population under consideration and/or the sample drawn from that population must distribute normally. For example, because $\sigma$ is a mathematical function

*Sample testing will not apply to new meters. The new meters will each be tested and the test recorded by the meter test department at South Kentucky.

of the normal curve, precisely 68.26% of the items comprising the distribution will be contained in $\pm$ one $\sigma$, etc.

If the items do not distribute normally, an error or uncertainty will be introduced, the magnitude of which will depend on the degree of nonconformity of the data from the normal distribution.

If the population is homogeneous, where the quantity measured is a continuous variable and occurs randomly, and where the sample is selected randomly, the sample will distribute approximately normal, with better and better approximations as the sample size increases. But when watthour meters of different age, manufacturer, bearing systems, retarding magnets, etc., are grouped together for purposes of sample testing the group may no longer be sufficiently homogeneous to produce distributions for which $\overline{X}$ and $\sigma$ are meaningful.

The experience of some utilities using sample testing has been to get multimodal, and particularly bimodal distributions. (figure 1) Also, some distributions particularly on light load tests bear no resemblance whatever to the normal curve.

The question to be answered is what is a good enough approximation of the normal distribution to justify the use of its statistics. This question must be resolved by the users of the sampling plan as the situations occur. When these situations occur the user must be aware of the limitations of the information derived, and he should attempt to determine the cause.

The sample should be drawn randomly. That is, each meter in the group should have an equal chance of being selected. For a given year the sample should be without replacement. In subsequent years the sample should not include any meters which have been tested in the previous seven years.

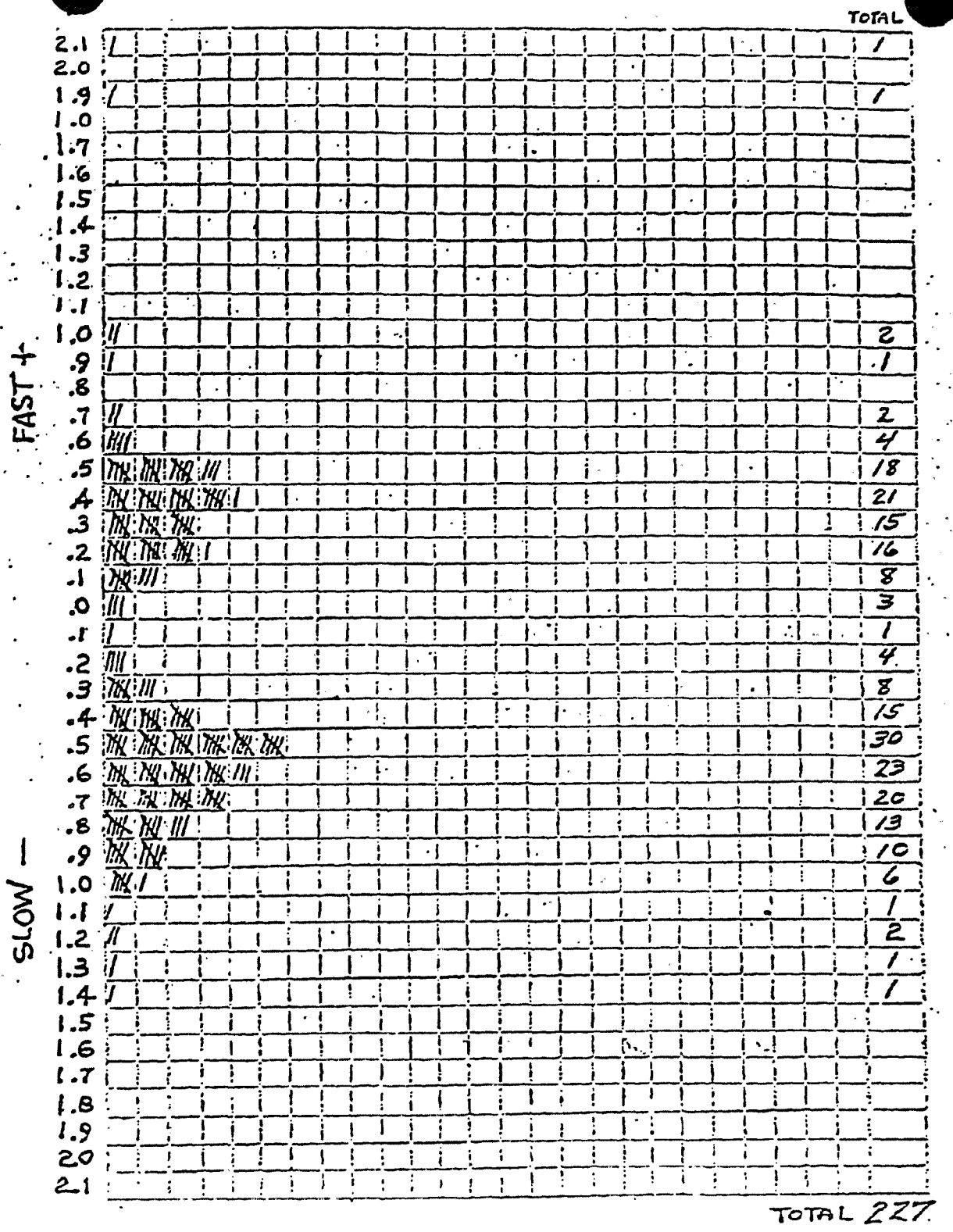

TOTAL
2.1 1
2.0
1.9 1
1.8
1.7
1.6
1.5
1.4
1.3
1.2
1.1
1.0 2
.9 1
.8
.7 2
.6 4
.5 18
.4 21
.3 15
.2 16
.1 8
.0 3
-.1 1
-.2 4
-.3 8
-.4 15
-.5 30
-.6 23
-.7 20
-.8 13
-.9 10
-1.0 6
-1.1 1
-1.2 2
-1.3 1
-1.4 1
-1.5
-1.6
-1.7
-1.8
-1.9
-2.0
-2.1
FAST +
SLOW —
TOTAL 227

Figure 1

The reliability of normal curve statistics begins to diminish at about sample size 200 (or below) and is generally considered too low at sample size 30. Consequently 30 should be the minimum sample size. Below this number other statistical techniques are employed.

In consideration of the preceeding arguments the following sample testing procedure is presented:

Steps:

1) Divide single phase meters into groups (usually five) according to differences in operating characteristics, bearing systems, compensations, etc.
2) Randomly select 2% of each group (minimum of 50). Eliminate from the sample any nonregistering meters and replace.
3) Test selected meters at LL, FL and 50% power factor when applicable (50% P.F. test will not be used in calculations).
4) Plot on separate tally sheets, FL, LL, and average of the two. (Note general shape of the distribution)
5) Compute sample mean and standard deviation for each of the above distributions.
   (Perform the following operations only on the distribution for the <u>average</u> of FL and LL)
6) Standardize variables (so standard normal curve tables may be used). This is performed as follows:
   The allowable error for meters is $\pm 2\%$, so $+2\%$ is the upper limit (u) and -2% is the lower limit (L). Then the standardized variables are $Z_u$ for upper and $Z_L$ for lower.

$$Z_u = \frac{u - X}{\sigma} = \frac{+2 - X}{\sigma}$$

$$Z_L = \frac{X - L}{\sigma} = \frac{X - (-2)}{\sigma} = \frac{X + 2}{\sigma}$$

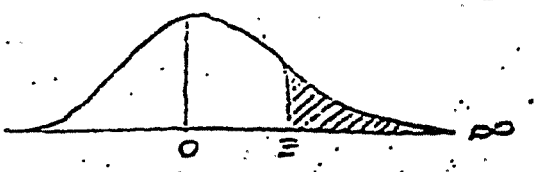
7) Enter table 1 page (7) with $Z = Z_U$ and read the percentage of meters faster than +2%.

Inter table 1 again with $Z = Z_L$ and read the percentage of meters slower than -2%.

These two values are added together. They will both either be positive or zero. This is the estimate of the percentage of meters in the group outside the limits of ± 2%.

8) Refer to the table in PSC ~~Elec 1 Rule XIV. 5(d)1~~ 807 KAR 5:041E SECT. 16 to determine if additional meters in the group must be tested. (see table 2, page 8)

AREAS
UNDER THE
STANDARD NORMAL CURVE
from Z to ∞
in percent




| Z | % area | Z | % area |
|---|---|---|---|
| 0.0 | 50.00 | 2.0 | 02.28 |
| 0.1 | 46.02 | 2.1 | 01.79 |
| 0.2 | 42.07 | 2.2 | 01.39 |
| 0.3 | 38.21 | 2.3 | 01.07 |
| 0.4 | 34.46 | 2.4 | 00.82 |
| 0.5 | 30.85 | 2.5 | 00.62 |
| 0.6 | 27.42 | 2.6 | 00.47 |
| 0.7 | 24.20 | 2.7 | 00.35 |
| 0.8 | 21.19 | 2.8 | 00.26 |
| 0.9 | 18.41 | 2.9 | 00.19 |
| 1.0 | 15.87 | 3.0 | 00.13 |
| 1.1 | 13.57 | 3.1 | 00.10 |
| 1.2 | 11.51 | 3.2 | 00.07 |
| 1.3 | 09.68 | 3.3 | 00.05 |
| 1.4 | 08.08 | 3.4 | 00.03 |
| 1.5 | 06.68 | 3.5 | 00.02 |
| 1.6 | 05.48 | 3.6 | 00.02 |
| 1.7 | 04.46 | 3.7 | 00.01 |
| 1.8 | 03.59 | 3.8 | 00.01 |
| 1.9 | 02.87 | 3.9 | 00.00 |

TABLE 1

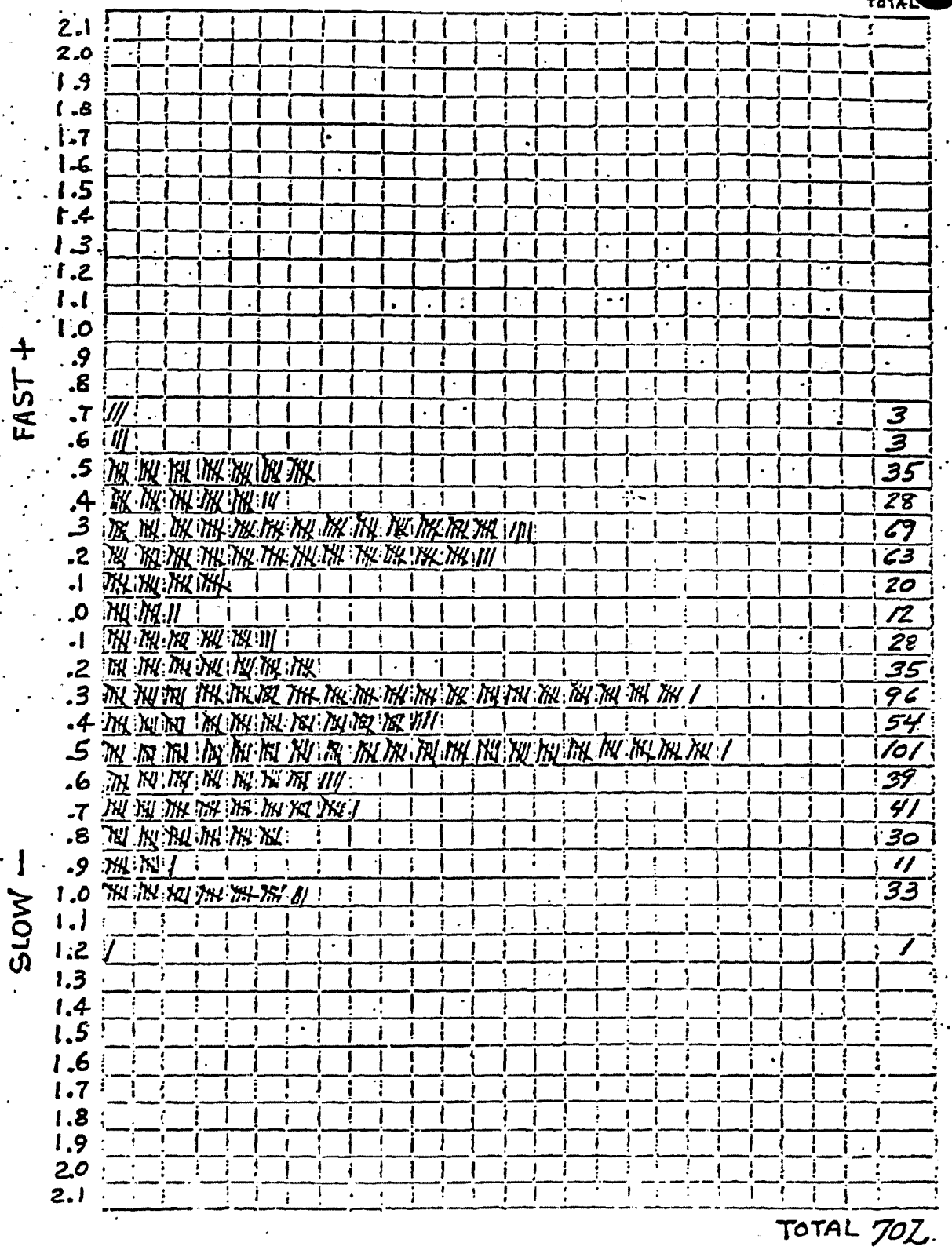
| Percent of Meters Within Limits of 2% Fast or Slow (Indicated by Sample)* | | Percentage of Meters to be Tested Annually |
|---|---|---|
| 99.0 | 100.0 | 2 |
| 98.0 | 98.9 | 4 |
| 97.0 | 97.9 | 6 |
| 96.0 | 96.9 | 8 |
| 95.0 | 95.9 | 10 |
| 93.0 | 94.9 | 12 |
| 91.0 | 92.9 | 14 |
| Less than | 91.0 | 16 |

* From PSC 807 KAR 5:041 SECTION 16

TABLE 2

APPENDIX "I" (7 pages)

Example of Distribution Tables, Computation of $\bar{X}$ and $\sigma$—, and use of Tables I and II.


TOTAL
FAST +
SLOW −
2.1
2.0
1.9
1.8
1.7
1.6
1.5
1.4
1.3
1.2
1.1
1.0
.9
.8
.7
.6
.5
.4
.3
.2
.1
.0
-.1
-.2
-.3
-.4
-.5
-.6
-.7
-.8
-.9
-1.0
-1.1
-1.2
-1.3
-1.4
-1.5
-1.6
-1.7
-1.8
-1.9
-2.0
-2.1
3
3
35
28
69
63
20
12
28
35
96
54
101
39
41
30
11
33
1
TOTAL 702

m SQ 35 10 SAMPLE TESTS 1968 GROUP 5

AVERAGE (X) = .427
STD. DEV. (σ) = .702
NO. OF METERS

| | METER ERROR IN % (X) | NO. OF METERS (n) | (nx) | (x²) | (nx²) |
|---|---|---|---|---|---|
| FAST (+) | 2.1 | | | 4.41 | |
| | 2.0 | | | 4.00 | |
| | 1.9 | | | 3.61 | |
| | 1.8 | | | 3.24 | |
| | 1.7 | | | 2.89 | |
| | 1.6 | | | 2.56 | |
| | 1.5 | | | 2.25 | |
| | 1.4 | | | 1.96 | |
| | 1.3 | | | 1.69 | |
| | 1.2 | | | 1.44 | |
| | 1.1 | | | 1.21 | |
| | 1.0 | | | 1.00 | |
| | .9 | | | 0.81 | |
| | .8 | | | 0.64 | |
| | .7 | 3 | 2.1 | 0.49 | 1.47 |
| | .6 | 3 | 1.8 | 0.36 | 1.08 |
| | .5 | 35 | 17.5 | 0.25 | 8.75 |
| | .4 | 28 | 11.2 | 0.16 | 4.48 |
| | .3 | 67 | 20.1 | 0.09 | 6.03 |
| | .2 | 63 | 12.6 | 0.04 | 2.52 |
| | .1 | 20 | 2.0 | 0.01 | .20 |
| | | TOTAL 2 = | 67.7 | | |
| SLOW (-) | 0 | 17 | 00.0 | 0.00 | 00.00 |
| | .1 | 20 | 2.0 | 0.01 | .20 |
| | .2 | 35 | 7.0 | 0.04 | 1.40 |
| | .3 | 33 | 23.1 | 0.09 | 2.97 |
| | .4 | 30 | 21.6 | 0.16 | 7.68 |
| | .5 | 101 | 50.5 | 0.25 | 25.25 |
| | .6 | 57 | 25.1 | 0.36 | 15.66 |
| | .7 | 41 | 28.7 | 0.49 | 20.09 |
| | .8 | 30 | 24.0 | 0.64 | 19.20 |
| | .9 | 11 | 9.9 | 0.81 | 8.91 |
| | 1.0 | 22 | 22.0 | 1.00 | 22.00 |
| | 1.1 | | | 1.21 | |
| | 1.2 | 1 | 1.2 | .44 | 1.44 |
| | 1.3 | | | 1.69 | |
| | 1.4 | | | 1.96 | |
| | 1.5 | | | 2.25 | |
| | 1.6 | | | 2.56 | |
| | 1.7 | | | 2.89 | |
| | 1.8 | | | 3.24 | |
| | 1.9 | | | 3.61 | |
| | 2.0 | | | 4.00 | |
| | 2.1 | | | 4.41 | |
| | TOTAL 1 = | 702 | TOTAL 3 = | 230.9 | TOTAL 4 = | 165.20 |

$$\bar{X} = \frac{\text{TOTAL 2} - \text{TOTAL 3}}{\text{TOTAL 1}}$$

$$\bar{X} = \frac{(67.7) - (230.9)}{(702)}$$

$$\bar{X} = \frac{(-163.2)}{(702)} = -.232\%$$

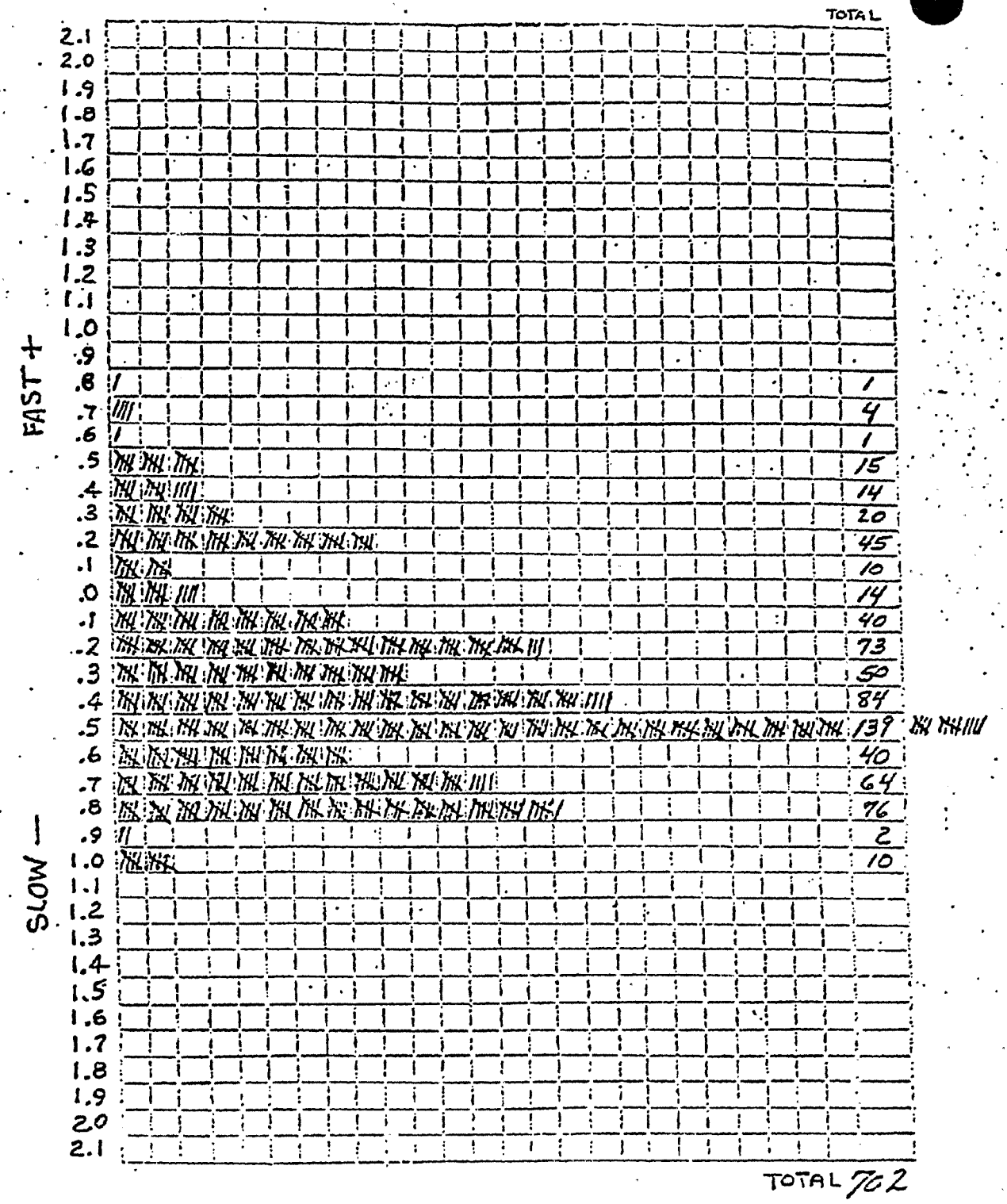
$$\sigma = \sqrt{\frac{\text{TOTAL 4}}{\text{TOTAL 1}} - \bar{X}^2}$$

$$\sigma = \sqrt{\frac{(165.20)}{(702)} - (.232)^2}$$

$$\sigma = \sqrt{(.2357) - (.0538)}$$

$$\sigma = \sqrt{(.1821)} = .427\%$$

TALLY SHEET


TOTAL
2.1
2.0
1.9
1.8
1.7
1.6
1.5
1.4
1.3
1.2
1.1
1.0
.9
.8
.7
.6
.5
.4
.3
.2
.1
.0
.1
.2
.3
.4
.5
.6
.7
.8
.9
1.0
1.1
1.2
1.3
1.4
1.5
1.6
1.7
1.8
1.9
2.0
2.1
FAST +
SLOW —
1
4
1
15
14
20
45
10
14
40
73
50
84
139
40
64
76
2
10
TOTAL 762

SD 35 1% SAMPLE TESTS 1968 GROUPS

STD. DEV (C) = .357
NO. OF METERS = 702

| | PER ERROR IN % (X) | NO. OF METERS (n) | (nx) | $(x^2)$ | $(nx^2)$ |
|---|---|---|---|---|---|
| FAST (+) | 2.1 | | | 4.41 | |
| | 2.0 | | | 4.00 | |
| | 1.9 | | | 3.61 | |
| | 1.8 | | | 3.24 | |
| | 1.7 | | | 2.89 | |
| | 1.6 | | | 2.56 | |
| | 1.5 | | | 2.25 | |
| | 1.4 | | | 1.96 | |
| | 1.3 | | | 1.69 | |
| | 1.2 | | | 1.44 | |
| | 1.1 | | | 1.21 | |
| | 1.0 | | | 1.00 | |
| | .9 | | | 0.81 | |
| | .8 | 1 | .8 | 0.64 | .64 |
| | .7 | 4 | 2.8 | 0.49 | 1.96 |
| | .6 | 1 | .6 | 0.36 | .36 |
| | .5 | 15 | 7.5 | 0.25 | 3.75 |
| | .4 | 111 | 44.4 | 0.16 | 17.76 |
| | .3 | 20 | 6.0 | 0.09 | 1.80 |
| | .2 | 115 | 23.0 | 0.04 | 4.60 |
| | .1 | 10 | 1.0 | 0.01 | .10 |
| | | TOTAL 2 = | 33.3 | | |
| SLOW (−) | 0 | 131 | 00.0 | 0.00 | 00.00 |
| | .1 | 115 | 11.5 | 0.01 | 1.15 |
| | .2 | 73 | 14.6 | 0.04 | 2.92 |
| | .3 | 50 | 15.0 | 0.09 | 4.50 |
| | .4 | 41 | 16.4 | 0.16 | 6.56 |
| | .5 | 137 | 68.5 | 0.25 | 34.25 |
| | .6 | 40 | 24.0 | 0.36 | 14.40 |
| | .7 | 61 | 42.7 | 0.49 | 29.89 |
| | .8 | 76 | 60.8 | 0.64 | 48.64 |
| | .9 | 7 | 6.3 | 0.81 | 5.67 |
| | 1.0 | 10 | 10.0 | 1.00 | 10.00 |
| | 1.1 | | | 1.21 | |
| | 1.2 | | | 1.44 | |
| | 1.3 | | | 1.69 | |
| | 1.4 | | | 1.96 | |
| | 1.5 | | | 2.25 | |
| | 1.6 | | | 2.56 | |
| | 1.7 | | | 2.89 | |
| | 1.8 | | | 3.24 | |
| | 1.9 | | | 3.61 | |
| | 2.0 | | | 4.00 | |
| | 2.1 | | | 4.41 | |
| | TOTAL 1 = | 702 | TOTAL 3: | 273.1 | TOTAL 4 = 174.43 |

$$\bar{x} = \frac{\text{TOTAL 2} - \text{TOTAL 3}}{\text{TOTAL 1}}$$

$$\bar{x} = \frac{(33.3) - (273.1)}{(702)}$$

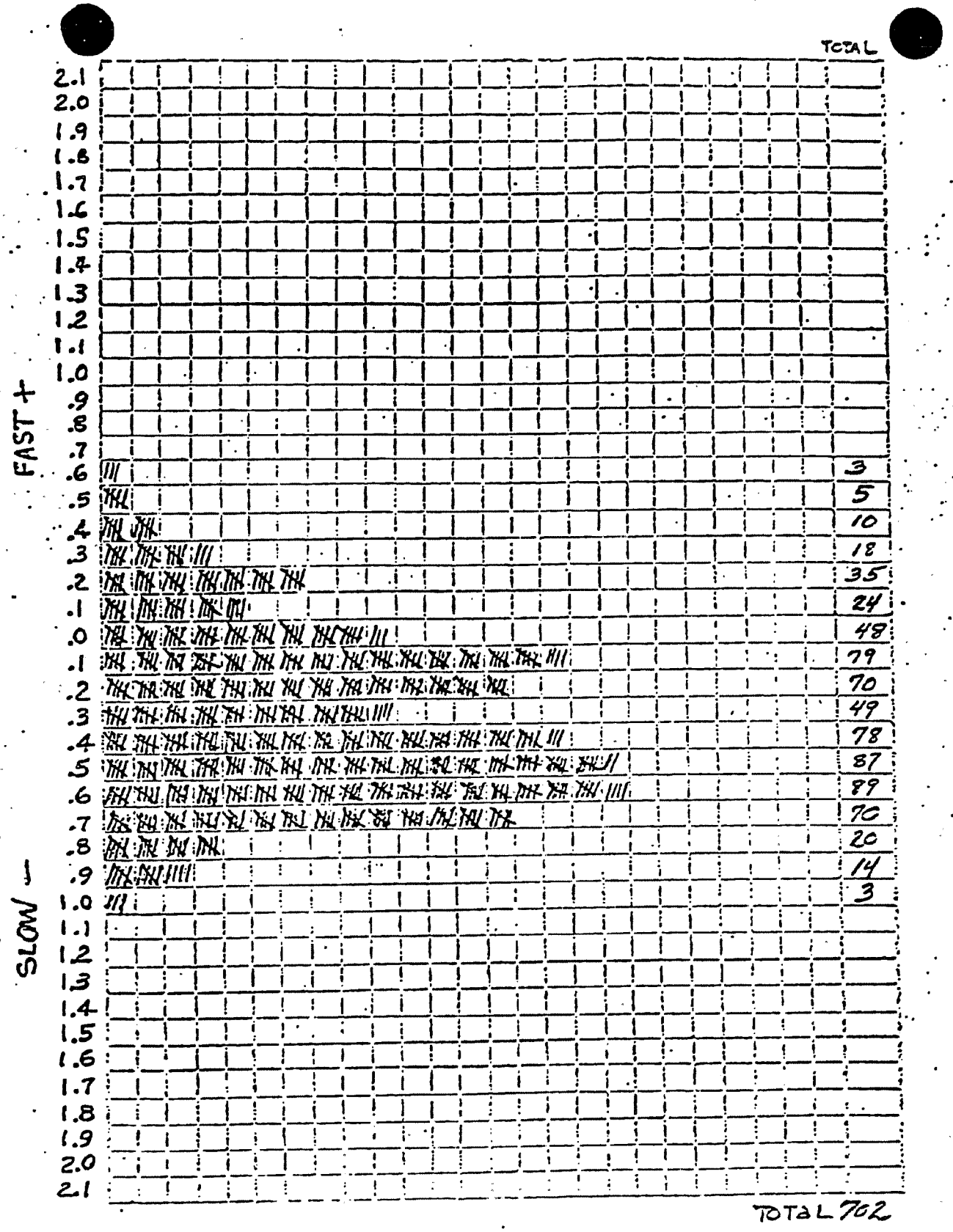
$$\bar{x} = \frac{-239.8}{702} = -.342\%$$

$$\sigma = \sqrt{\frac{\text{TOTAL 4}}{\text{TOTAL 1}} - \bar{x}^2}$$

$$\sigma = \sqrt{\frac{(174.43)}{(702)} - (.342)^2}$$

$$\sigma = \sqrt{(.3999) - (.1211)}$$

$$\sigma = \sqrt{(.1277)} = .357\%$$


TOTAL
FAST +
SLOW -
2.1
2.0
1.9
1.8
1.7
1.6
1.5
1.4
1.3
1.2
1.1
1.0
.9
.8
.7
.6
.5
.4
.3
.2
.1
.0
.1
.2
.3
.4
.5
.6
.7
.8
.9
1.0
1.1
1.2
1.3
1.4
1.5
1.6
1.7
1.8
1.9
2.0
2.1
3
5
10
18
35
24
48
79
70
49
78
87
89
70
20
14
3
TOTAL 702

Form SD 35 1% SAMPLE TESTS 1978 GROUP 5

MEAN (X̄) = -.316
STD. DEV. (σ) = .322
NO. OF METERS = 702

| METER ERROR IN %, (X) | NO. OF METERS (n) | (nx) | | (x²) | (nx²) |
|---|---|---|---|---|---|
| | | | 2.1 | 4.41 | |
| | | | 2.0 | 4.00 | |
| | | | 1.9 | 3.61 | |
| | | | 1.8 | 3.24 | |
| | | | 1.7 | 2.89 | |
| | | | 1.6 | 2.56 | |
| | | | 1.5 | 2.25 | |
| | | | 1.4 | 1.96 | |
| | | | 1.3 | 1.69 | |
| | | | 1.2 | 1.44 | |
| | | | 1.1 | 1.21 | |
| | | | 1.0 | 1.00 | |
| | | | .9 | 0.81 | |
| | | | .8 | 0.64 | |
| | | | .7 | 0.49 | |
| FAST (+) | .6 | 3 | 1.8 | 0.36 | 1.08 |
| | .5 | 5 | 2.5 | 0.25 | 1.25 |
| | .4 | 10 | 4.0 | 0.16 | 1.60 |
| | .3 | 18 | 5.4 | 0.09 | 1.62 |
| | .2 | 35 | 7.0 | 0.04 | 1.40 |
| | .1 | 54 | 5.4 | 0.01 | .54 |
| | | TOTAL 2 = | 23.1 | | |
| | .0 | 118 | .00.0 | 0.00 | 00.00 |
| | .1 | 77 | 7.7 | 0.01 | .77 |
| | .2 | 70 | 14.0 | 0.04 | 2.80 |
| | .3 | 47 | 14.1 | 0.09 | 4.41 |
| | .4 | 28 | 11.2 | 0.16 | 17.92 |
| | .5 | 37 | 18.5 | 0.25 | 21.25 |
| | .6 | 22 | 13.2 | 0.36 | 32.04 |
| | .7 | 10 | 7.0 | 0.49 | 34.30 |
| | .8 | 20 | 16.0 | 0.64 | 12.80 |
| SLOW (−) | .9 | 11 | 9.9 | 0.81 | 8.91 |
| | 1.0 | 5 | 5.0 | 1.00 | 5.00 |
| | 1.1 | | | 1.21 | |
| | 1.2 | | | 1.44 | |
| | 1.3 | | | 1.69 | |
| | 1.4 | | | 1.96 | |
| | 1.5 | | | 2.25 | |
| | 1.6 | | | 2.56 | |
| | 1.7 | | | 2.89 | |
| | 1.8 | | | 3.24 | |
| | 1.9 | | | 3.61 | |
| | 2.0 | | | 4.00 | |
| | 2.1 | | | 4.41 | |
| | TOTAL 1 = | 702 | TOTAL 3 = | 245.3 | TOTAL 4 = 142.90 |

$$\bar{X} = \frac{\text{TOTAL 2} - \text{TOTAL 3}}{\text{TOTAL 1}}$$

$$\bar{X} = \frac{(23.1) - (245.3)}{(702)}$$

$$\bar{X} = \frac{(-222.2)}{(702)} = -.316 \text{ ans.}$$

$$\sigma = \sqrt{\frac{\text{TOTAL 4}}{\text{TOTAL 1}} - \bar{X}^2}$$

$$\sigma = \sqrt{\frac{(142.90)}{(702)} - (.316)^2}$$

$$\sigma = \sqrt{(.2035) - (.0999)}$$

$$\sigma = \sqrt{(.1036)} = .322 \text{ ans.}$$

## Use of Tables I and II

From the computations for average load, from the previous page.

$\bar{X} = -.316 \cong -.32$

$\sigma = .322 \cong .32$

Standardize variables:

$Z_u = \frac{+2-(-.32)}{.32} = \frac{2.32}{.32} = 7.25 \cong 7.2$

$Z_L = \frac{-.32+2}{.32} = \frac{1.68}{.32} = 5.25 \cong 5.2$

(round off using standard round of rule, or interpolate)

Enter table I with $Z = 7.2$. Table only extends to $Z = 3.9$, so value for $Z = 7.2$ is zero.

The same is true for $Z = 5.2$. Consequently all meters are within the limits of $\pm 2\%$ and no additional meters must be tested.

Suppose $Z_u$ had been 1.4

and $Z_L$ had been 1.7

Then from Table I, the value for $Z_u = 8.08\%$

$Z_L = 4.46\%$

Adding these gives a total of 12.54%. Going to Table II it is seen that 16% of the meters in the group must be tested.

APPENDIX II

Method of Computing Confidence

Intervals for $\overline{X}$ and $\sigma$

(two pages)

## CONFIDENCE INTERVALS

Since the $\overline{X}$ and $\sigma$ of a sample which is drawn from a population are seldom exactly the same as the mean and standard deviation of the population, it is very helpful to be able to apply some test to determine how much in error they are likely to be.

This can be achieved by means of confidence intervals. The confidence interval provides a range of values within which you have a certain probability (confidence level) that the true population statistics will lie.

Any confidence level for the confidence interval may be computed, but the 95% confidence level is very frequently used. For a 95% confidence level, the confidence intervals for $\overline{X}$ and $\sigma$ are found from the following formulas:

$$\overline{X} \pm 1.96 \frac{\sigma}{\sqrt{N}} \qquad \sigma \pm 1.96 \frac{\sigma}{\sqrt{2N}}$$

Where N is the sample size.

Using a confidence interval only slightly larger, 95.44% instead of 95%, permits the use of a factor of 2 instead of 1.96 in the above formulas, thus simplifying the math.

Then:

for a 95.443 ≅ 95% confidence interval for $\bar{X}$ and $\sigma$, the equations become: $\bar{X} \pm 2\frac{\sigma}{\sqrt{N}}$ $\sigma \pm 2\frac{\sigma}{\sqrt{2N}}$

Example: N = 100
X = .25
o = .30

$\bar{X} \pm 2\frac{\sigma}{\sqrt{N}} = .25 \pm 2\frac{.30}{\sqrt{100}}$

$= .25 \pm \frac{.60}{10} = .25 \pm .06$

Which means that you can be approximately 95% sure that the true population mean is between .19 and .31.

$\sigma \pm 2\frac{\sigma}{\sqrt{2N}} = .30 \pm 2\frac{.30}{\sqrt{200}} = .30 \pm \frac{.60}{14.14}$

$= .30 \pm .04$

Which means that you can be approximately 95% sure that the true population standard deviation is between .26 and .34.

# RESPONSE TO PSC FIRST INFORMATION REQUEST

Q 6. Refer to Page 2 of the Application, in which South Kentucky states that "[i]f South Kentucky's meter testing program is suspended for five (5) years , a cost savings of $207,900.00 results by 69,300 meters x $3.00 per meter." Explain in detail the statement that South Kentucky will save $207,900 when, under South Kentucky's current meter-testing program, it is only required to test a certain percentage of its newly installed meters.

R 6. As stated in 807 KAR 5:041 Section 15(3) 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.

| Period Test Schedule | | |
|---|---|---|
| | Self-Contained Meters | |
| | Single phase | 8 years |
| | 3 wire network | 8 years |
| | Polyphase | 6 years |
| Meters used with instrument transformers | | |
| | Single phase | 6 years |
| | Polyphase | 4 years |
| Demand Meters | | |
| | Indicating block-interval and lagged-demand meters | Same as associated watt-hour meter |
| | Graphic and pulse operated recording demand meters | 2 years |
| Instrument Transformers | | |
| | Current: high burden test | same as associated watt-hour meter |
| | Potential: secondary voltage test | same as associated watt-hour meter |
| | Var-hour Meters | same as associated watt-hour meter |
| Direct Current Watt-hour Meters: | | |
| | Up to and including 6 KW | 4 years |
| | Over 6 KW through 100 KW | 2 years |
| | Over 100 KW | 1 year |

# RESPONSE TO PSC FIRST INFORMATION REQUEST

South Kentucky interprets this to mean that all 69,300 meters when removed will be required to be tested under this statue. With that understood then the $3.00 per meter cost would be incurred.

South Kentucky further understands that under the existing sample plan only meters which are 7 years or older would be subject to the testing sample.