

COMMONWEALTH OF KENTUCKY
BEFORE THE PUBLIC SERVICE COMMISSION

In the Matter of:

| | | |
|----------------------------------|---|------------|
| THE ELECTRONIC APPLICATION OF |) | |
| CUMBERLAND VALLEY ELECTRIC, INC. |) | CASE NO. |
| FOR APPROVAL OF CHANGES TO ITS |) | 2020-00393 |
| METER TESTING PLAN |) | |

APPLICATION

Comes now Cumberland Valley Electric, Inc. (“Cumberland Valley”), by counsel, pursuant to 807 KAR 5:041, 807 KAR 5:001 and other applicable law, and for its Application requesting approval of changes to its Meter Testing Plan, respectfully states as follows:

1. Cumberland Valley is a not-for-profit, member-owned, rural electric distribution cooperative organized under KRS Chapter 279. Cumberland Valley is engaged in the business of distributing retail electric power to approximately 23,682 members in the Kentucky counties of Bell, Clay, Harlan, Knox, Laurel, Leslie, Letcher, McCreary and Whitley.

2. Pursuant to 807 KAR 5:001 Section 14(1), Cumberland Valley’s mailing address is P.O. Box 440, Gray, Kentucky 40734, and its electronic mail address is psc@cumberlandvalley.coop. This Application, including the Exhibits attached hereto and incorporated herein, contain fully the facts on which Cumberland Valley’s request for relief is based, and an Order from the Commission granting the approval of the proposed changes to its Meter Testing Plan herein is requested.

3. Pursuant to 807 KAR 5:001 Section 14(2), Cumberland Valley states that it incorporated in Kentucky on July 12, 1940, and attests that it is presently a Kentucky corporation in good standing.

4. Cumberland Valley has determined that the proposed change to a sample meter testing plan for its single-phase meters will result in cost savings to Cumberland Valley and its members in the amount of approximately \$623,280 over an eight-year period. A copy of the cost saving calculations is attached as Exhibit 1. A copy of a quote received from Luthan Electric Meter Testing showing the cost of meter testing per meter is attached as Exhibit 2.

5. The Meter Testing Plan attached as Exhibit 3 is consistent with the requirements of 807 KAR 5:041 Section 16. In addition to requesting to change from the current eight-year periodic meter testing plan to a sample meter testing plan, the relevant changes in the proposed plan as compared to the current meter testing plan are as follows:

- Current plan – Cumberland Valley selects meters that are to be tested in the current year by looking at the last test date on the meter. The parameters for this are outlined in 807 KAR 5:041 Section 15, which states that single phase self-contained meters must be tested every eight years. With this method, each meter is tested every eight years, and if a meter tests out of tolerance, it is replaced. The quantity of meters that test out of tolerance does not factor into the number of meters tested for the year.
- Proposed plan – The selection of meters to test would follow the method outlined within the attached Meter Testing Plan. In short, Cumberland Valley will divide self-contained single-phase meters into lots of 1,000 (based on serial numbers). Within each lot, meters will be randomly selected for testing. Cumberland Valley

would be following the parameters outlined in 807 KAR 5:041 Section 16. Under the sample meter plan as proposed, a meter can go up to twenty-five years without being tested. However, due to using a statistical method of selecting meters, Cumberland Valley would be achieving the same assurance of meter accuracy, even though it would be testing fewer meters. If a meter tests out of tolerance under this method, the meter will be replaced. However, if enough meters test out of tolerance within a lot the whole lot will be tested over an eighteen-month period. The sample meter testing plan is a more efficient way of finding groups of meters that may have issues.

6. Cumberland Valley is submitting this Application electronically per the requirements of 807 KAR 5:001 Section 8.

7. Cumberland Valley requests expedited treatment for this Application due to the timing needed to complete the periodic testing of the meters if the proposed sample metering testing plan is not approved.

WHEREFORE, Cumberland Valley respectfully requests an Order from the Commission:

- (1) Granting the proposed changes to its Meter Testing Plan and to approve the Sample Meter Testing Plan for Single-Phase Meters as proposed in Exhibit 1;
- (2) Expedited treatment of the Application; and
- (3) Granting Cumberland Valley any and all other relief to which it may appear entitled.

This 8th day of January, 2021.

Respectfully submitted,

Mark David Goss

Mark David Goss

L. Allyson Honaker

GOSS SAMFORD, PLLC

2365 Harrodsburg Road, Suite B-325

Lexington, Kentucky 40504

mdgoss@gosssamfordlaw.com

allyson@gosssamfordlaw.com

(859) 368-7740

Counsel for Cumberland Valley Electric, Inc.

Annual Costs with Current Periodic Testing Program

| | |
|--|--------------|
| Number of Single Phase Self Contained Meters | 24,810 |
| Number of Years in Periodic Testing Cycle | 8 |
| Number of Meters to Test Per Year | <u>3,101</u> |

| | |
|-----------------------------------|---------------------|
| Number of Meters to Test Per Year | 3,101 |
| Cost of Testing One Meter | \$35 |
| Annual Cost of Meter Testing | <u>\$108,535.00</u> |

Cost of Meter Testing over 8-Year Cycle Using Periodic Testing \$868,280.00

Proposed Sample Testing Costs

| | |
|--|-----------|
| Number of Single Phase Self Contained Meters | 24,810 |
| Maximum Number of Meters Per Lot | 1,000 |
| Number of Lots | <u>25</u> |

| | |
|-----------------------------------|------------|
| Number of Lots | 25 |
| Meters to Be Tested Per Lot | 35 |
| Number of Meters to Test Per Year | <u>875</u> |

| | |
|-----------------------------------|--------------------|
| Number of Meters to Test Per Year | 875 |
| Cost of Testing One Meter | \$35 |
| Annual Cost of Meter Testing | <u>\$30,625.00</u> |

Cost of Meter Testing over 8-Year Cycle Using Sample Testing \$245,000.00

Potential Savings over 8-year cycle by Using Sample Testing \$623,280.00

Statement of Work

Customer

Cumberland Valley RECC

Scope of Work

LUTHAN is a full-service electric meter testing company with a full-time staff of Certified Meter Testers as certified by the Commonwealth of Kentucky Public Service Commission. The expertise and availability of staffing is sufficient to complete the work as requested.

On Site Testing

Single Phase\Poly Phase Self-Contained Field Test

- Record all energy readings and meter nameplate information
- Report any hazardous conditions requiring immediate attention to the utility
- Verify billing multiplier
- Complete ANSI test on meter to verify accuracy
- Calibrate meter to +/- 1% accuracy as necessary
- Document site with digital photos as needed
- Provide customized electronic file of meter test results that will import into utility CIS system
- Provide summary report of findings
- Perform minor repairs that can be made on-site

Instrument Rated Site Test

- Record all energy readings and meter nameplate information
- Perform full inspection of IT Rated metering installations
- Report any hazardous conditions requiring immediate attention to the utility
- Perform Ratio and Burden test on current transformers
- Verify voltage ratio on secondary voltage transformers
- Induce load if necessary
- Verify billing multiplier
- Complete ANSI test on meter to verify accuracy
- Perform complete site test
- Document site with digital photos as needed
- Provide site analysis report showing vectors, rotation, voltage, current and harmonics
- Provide summary report of findings
- Provide utility with a digital format of results

Rate Schedule

| Field | Cost |
|--|---------------|
| Single Phase Self-Contained Field Test | \$35/Site |
| Poly-Phase Self-Contained Field Test | \$85/Site |
| Instrument Rated Site Test | \$137.21/Site |
| | |

*IR Pricing includes 2 meter technicians and a bucket truck

Acceptance and Authorization

By signing below, both parties agree to the included Scope of Work and Rate Schedule.

Cumberland Valley RECC

LUTHAN Electric Meter Testing, LLC

Full Name

Title

Signature

Date

Full Name

Title

Signature

Date

**PROPOSED SAMPLE METER TESTING PLAN FOR
CUMBERLAND VALLEY ELECTRIC'S SINGLE-PHASE
METERS**

Cumberland Valley Electric, Inc.
Gray, Kentucky

Prepared by
Mark Abner, P.E.
Cumberland Valley Electric, Inc.
December 2, 2020

INTRODUCTION

Cumberland Valley Electric, Inc. (Cumberland Valley) is an electric distribution cooperative located in southeastern Kentucky. Cumberland Valley currently uses a periodic eight-year meter testing program. In 2018 Cumberland Valley filed for a Certificate of Public Convenience and Necessity to install an Advanced Metering Infrastructure (AMI) system (Case No. 2018-00056). In its final Order the Kentucky Public Service Commission (PSC) granted Cumberland Valley relief from periodic testing of meters pursuant to 807 KAR5:041, Section 15(3). This relief will expire on December 31, 2020 and Cumberland Valley will be required to resume its normal meter testing program. Cumberland Valley would like to transition from its current eight-year meter testing program and adopt a sample meter testing program. This will allow Cumberland Valley to take significant steps toward maximizing efficiency in the single-phase meter reading and testing area of our operations. It is the purpose of this proposal to demonstrate the methods used and the cost savings achieved in sample testing.

RULES AND REGULATIONS

Kentucky Public Service Commission (PSC) rules and regulations outline the required method and techniques of sample meter testing. Cumberland Valley will comply with the Commission requirements related to the sampling and testing of meters as provided for in 807 KAR 5:006 and 807 KAR 5:041. Cumberland Valley will implement the sample meter testing plan as submitted in this application.

PROCEDURE

The table below illustrates that meters will be divided into separate homogeneous groups based upon manufacturer and type. Due to the large number of meters that fall within group 1 Cumberland Valley will further divide this group into lots of 1,000 meters based on serial numbers.

PROCEDURE (cont.)

Meter Groups

| | Manufacturer | Type | Form | Population |
|---|--------------|---------|------|----------------------|
| 1 | Itron | I-210+C | 2S | 24, 810 ¹ |

Cumberland Valley’s statistical meter sample testing will follow **American National Standard Institute ANSI/ASQC Z1. 9-2003 (Sampling Procedures and Tables for Inspection)**. Each test group will be randomly sampled by a computerized process. Cumberland Valley will use an Excel spreadsheet to randomly select meters from each test group.

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

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

Newly purchased and/or installed meters will be added to the proper group and will be eligible for sample testing the following year. New meters from a different manufacturer or with different characteristics/features will require the formation of a new group. The formation of any new groups will adhere to the same maximum lot population of 1,000 and testing methodology outlined within this sample meter testing plan. **Table A-2** provides the Sample Size Code Letters that are then to be referenced in **Table B-3**. The “Normal Inspection” portion of the **Table B-3** is then used to determine the sample size for each test group.

Cumberland Valley will sample test new meters using an Inspection Level I and an AQL 1.0

Randomly selected meters from each lot will be tested in the field. If the selected meter is damaged or non-registering (due to lightning strikes, fires, etc.) that is not a manufacturer’s defect or the meter was exposed to abnormal conditions, these meters will be replaced by another random selection. Cumberland Valley will track non-registering meters to determine if there is any pattern related to external forces which may be a root cause for non-registering meters.

¹ The maximum population of any lot will not exceed 1,000 with the group listed above being divided into lots of 1,000 based on serial number.

PROCEDURE (cont.)

The meters will be tested under full load, light load and at 50 percent power factor at full load in accordance with 807 KAR 5:041 Section 17(1).

Watt-hour meters shall be retired when the error in registration exceeds 1% at either light load or full load.

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

Lot performance shall be deemed acceptable if the full load and light load performance of the meters is within the lot meet the acceptability criteria of the **ANSI** standard. When a lot is classified as failed, Cumberland Valley will test the entire lot of meters within 18 months once it has failed the applicable governing standard.

No meter shall remain in service without periodic test for a period longer than twenty-five (25) years.

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

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

PROCEDURE (cont.)

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

Table A-1²
AQL Conversion Table

| For specified AOL 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-2³
Sample Size Code Letters

| 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 | |

² From ANSI/ASQ Z1.9-2003 (R2013) – SAMPLING PROCEDURES AND TABLES FOR INSPECTION BY VARIABLES FOR PERCENT NONCONFORMING

³ From ANSI/ASQ Z1.9-2003 (R2013) – SAMPLING PROCEDURES AND TABLES FOR INSPECTION BY VARIABLES FOR PERCENT NONCONFORMING

PROCEDURE (cont.)

Table B-3⁴

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

| Sample Size Code Letter | Sample Size | Acceptance Quality Limits (normal inspection) | | | | | | | | | | | |
|--|-------------|---|-------|-------|-------|-------|------|------|------|-------|-------|-------|-------|
| | | T | .10 | .15 | .25 | .40 | .65 | 1.00 | 1.50 | 2.50 | 4.00 | 6.50 | 10.00 |
| | | M | M | M | M | M | M | M | M | M | M | M | M |
| B | 3 | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | 7.59 | 18.86 | 26.94 | 33.69 |
| C | 4 | ↓ | ↓ | ↓ | ↓ | ↓ | ↓ | 1.49 | 5.46 | 10.88 | 16.41 | 22.84 | 29.43 |
| D | 5 | ↓ | ↓ | ↓ | ↓ | 0.041 | 1.34 | 3.33 | 5.82 | 9.80 | 14.37 | 20.19 | 26.55 |
| E | 7 | ↓ | 0.005 | 0.087 | 0.421 | 1.05 | 2.13 | 3.54 | 5.34 | 8.40 | 12.19 | 17.34 | 23.30 |
| 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 |
| 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 |
| 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 |
| 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 |
| 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 |
| 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 |
| 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 |
| 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 |
| 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 |
| 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 |
| | | .10 | .15 | .25 | .40 | .65 | 1.00 | 1.50 | 2.50 | 4.00 | 6.50 | 10.00 | |
| Acceptance Quality Limits (tightened inspection) | | | | | | | | | | | | | |

⁴ From ANSI/ASQ Z1.9-2003 (R2013) – SAMPLING PROCEDURES AND TABLES FOR INSPECTION BY VARIABLES FOR PERCENT NONCONFORMING

COST SAVINGS/CONCLUSION

A substantial reduction in cost will be achieved by implementing the sample meter test method. Once the program is established, only a small percentage of present labor and testing efforts will be required. This reduction results in cost savings without compromising single-phase metering accuracy. The comparison below shows the cost for Cumberland Valley when doing in field testing under both Periodic and Sample testing methods.

Cost Savings to Cumberland Valley due to a change to Metering Sample Testing

Assumptions:

Current periodic testing would require testing of 3,101 meters annually
In field testing is \$35 per meter
Test 875 sample meters annually

Annual Costs with Current Periodic Testing Program

| <u>Meters to be Tested</u> | <u>Cost to Test</u> | <u>Annual Cost</u> |
|----------------------------|---------------------|--------------------|
| 3,101 | \$35.00 | \$108,535.00 |

| | |
|-----------------------------------|--------------|
| Cost of Testing over 8-year cycle | \$868,280.00 |
|-----------------------------------|--------------|

Proposed Sample Testing Costs

| <u>Meters to be Tested</u> | <u>Cost to Test</u> | <u>Annual Cost</u> |
|----------------------------|---------------------|--------------------|
| 875 | \$35.00 | \$30,625.00 |

| | |
|-----------------------------------|--------------|
| Cost of Testing over 8-year cycle | \$245,000.00 |
|-----------------------------------|--------------|

| | |
|--|---------------------|
| Potential Savings over 8-year cycle | \$623,280.00 |
|--|---------------------|