COMMONWEALTH OF KENTUCKY

BEFORE THE PUBLIC SERVICE COMMISSION

In the Matter of:

ELECTRONIC INVESTIGATION TO CONSIDER DEVIATION OF REGULATION 807 KAR 5:041, SECTION 7, VOLTAGE SURVEYS AND RECORDS	**)** **)** **)** **)**	**CASE NO. 2025-00131**

RESPONSE OF LOUISVILLE GAS AND ELECTRIC COMPANY AND KENTUCKY UTILITIES COMPANY TO THE COMMISSION STAFF'S FIRST REQUEST FOR INFORMATION DATED JUNE 9, 2025

FILED: JUNE 27, 2025

VERIFICATION

COMMONWEALTH OF KENTUCKY)
)
COUNTY OF JEFFERSON)

The undersigned, **Shannon L. Montgomery**, being duly sworn, deposes and says she is the Vice President, Customer Services for Kentucky Utilities Company and Louisville Gas and Electric Company and an employee of LG&E and KU Services Company, that she has personal knowledge of the matters set forth in the responses for which she is identified as the witness, and the answers contained therein are true and correct to the best of her information, knowledge, and belief.

Shannon L. Montgomery

Subscribed and sworn to before me, a Notary Public in and before said County and State, this 25th day of June 2025.

Notary Public

Notary Public ID No. KYNP63286

My Commission Expires:

January 22, 2027

VERIFICATION

COMMONWEALTH OF KENTUCKY)
)
COUNTY OF JEFFERSON)

The undersigned, **Peter W. Waldrab**, being duly sworn, deposes and says that he is Vice President, Electric Distribution, for Kentucky Utilities Company and Louisville Gas and Electric Company and an employee of LG&E and KU Services Company, that he has personal knowledge of the matters set forth in the responses for which he is identified as the witness, and the answers contained therein are true and correct to the best of his information, knowledge, and belief.

Peter W. Waldrab

Subscribed and sworn to before me, a Notary Public in and before said County and State, this 23rd day of June 2025.

Notary Public

Notary Public ID No. KYNP63286

My Commission Expires:

January 22, 2027

LOUISVILLE GAS AND ELECTRIC COMPANY
AND
KENTUCKY UTILITIES COMPANY

Response to Commission Staff's First Request for Information
Dated June 9, 2025

Case No. 2025-00131

Question No. 1

Responding Witness: Peter W. Waldrab

Q-1. State whether the electric utility currently has advanced metering infrastructure (AMI) capabilities in place.

A-1. The Companies expect to complete implementation and deployment of AMI in accordance with the Kentucky Public Service Commission's Order of June 30, 2021, and subsequent order of December 6, 2021, in Case Nos. 2020-00349 and 2020-00350 by December 31, 2025. As of the date of this response, 98% of the Companies' meters have been upgraded to AMI meters.

LOUISVILLE GAS AND ELECTRIC COMPANY
AND
KENTUCKY UTILITIES COMPANY

Response to Commission Staff's First Request for Information
Dated June 9, 2025

Case No. 2025-00131

Question No. 2

Responding Witness: Peter W. Waldrab

Q-2. State whether the electric utility has AMI equipment and software with the capability to monitor and record voltage of an individual customer over a determined period of time.

A-2. The AMI meters deployed by the Companies record voltage for every customer every 15 minutes. The recorded voltage reading is an average over that 15-minute interval. Said voltage readings are collected at the Companies' AMI management and meter data management systems. The voltage readings are retained for 5 years, satisfying the requirements in 807 KAR 5:041, Section 7.

Further, designated "bellwether" meters used for voltage optimization record voltage every 5 minutes and those records are also retained for 5 years.

LOUISVILLE GAS AND ELECTRIC COMPANY
AND
KENTUCKY UTILITIES COMPANY

Response to Commission Staff's First Request for Information
Dated June 9, 2025

Case No. 2025-00131

Question No. 3

Responding Witness: Peter W. Waldrab

Q-3. State whether the utility has other equipment on the system that can also monitor and record voltage.

A-3. Most Supervisory Control and Data Acquisition (SCADA) enabled equipment installed on the electric distribution system, including substation circuit breakers, pole-top reclosers, and capacitor banks, monitor and record voltage. Accuracies vary by device type and may meet the requirements specified in 807 KAR 5:041, Section 7.

LOUISVILLE GAS AND ELECTRIC COMPANY
AND
KENTUCKY UTILITIES COMPANY

Response to Commission Staff's First Request for Information
Dated June 9, 2025

Case No. 2025-00131

Question No. 4

Responding Witness: Peter W. Waldrab

Q-4. State if the ability to monitor and record voltage of individual customers is as accurate as equipment required by 807 KAR 5:041, Section 7, and if so, state how this is determined.

A-4. The Companies' AMI meters provide adequate accuracy to replace dedicated voltage monitoring equipment required by 807 KAR 5:041 Section 7.

The Companies' AMI meters comply with requirements for 0.2 accuracy class set forth in ANSI C12.20, having a manufacturer-specified voltage reading accuracy of +/- 1%. AMI meters are primarily designed to measure electricity consumption for customer billing, but they also record voltage data for monitoring, analysis, and event management.

Portable indicating voltmeters and graphic recording voltmeters, specified by 807 KAR 5:041, Section 7, are instruments primarily designed to measure voltage at high sampling rates, and some have accuracies better than +/- 1%. However, these voltmeters' stated accuracy depends on the individual model's design, calibration, and environmental conditions.

Because the AMI meters deployed across Companies' service territories are of equal manufacturer-specified voltage reading accuracy, the precision of AMI recorded voltage data remains uniform and more consistent across the surveyed customer population.

LOUISVILLE GAS AND ELECTRIC COMPANY
AND
KENTUCKY UTILITIES COMPANY

Response to Commission Staff's First Request for Information
Dated June 9, 2025

Case No. 2025-00131

Question No. 5

Responding Witness: Shannon L. Montgomery / Peter W. Waldrab

Q-5. State if the utility intends to perform ongoing tests of the accuracy of the AMI voltage recordings and describe the intended process.

A-5. The Companies intend to resume testing of electric meters as specified by 807 KAR 5:041, Sections 15 and 16 [1] and approved in Case Nos. 99-441 and 2005-00276. As part of said testing mechanism procedures, the Companies shall field check the AMI recorded voltage readings with an indicating voltmeter.

[1] In Case No. 2020-00350, the Companies filed a CPCN application for full deployment of advanced meters. In that case, the Companies requested deviations from the requirement in 807 KAR 5:041 Sections 15(3) and 16 that single-phase electric meters must be tested every eight years or in accordance with a Commission-approved sample-meter testing plan, and from 807 KAR 5:041, Section 15(3)'s requirement to test metering equipment when removed from service. See 11/25/2020 Application, Paragraph 34 at page 18. The parties to those cases reached a Stipulation Agreement after settlement negotiations. See 6/30/21 Final Order, Appendix A. The Stipulation provided that all relief requested by the Companies not specifically addressed in the Stipulation Agreement was agreed by the parties to be "approved as filed." See Paragraph 5.9 of the Stipulation ("The Parties recommend to the Commission that, except as modified in this Stipulation and the exhibits attached hereto, all other relief requested in the Utilities' filings in these Rate Proceedings, including without limitation all rates, terms, conditions, certificates of public convenience and necessity, *regulatory waivers,* and deferral accounting, should be approved as filed or as later corrected or amended by the Utilities in their responses to data requests.") (emphasis added). And in its Final Order of June 30, 2021, the Commission approved the Stipulation with the modifications discussed in that Order. The Commission did not make any modifications to the approval of the request for deviation from the meter testing requirement.

LOUISVILLE GAS AND ELECTRIC COMPANY
AND
KENTUCKY UTILITIES COMPANY

Response to Commission Staff's First Request for Information
Dated June 9, 2025

Case No. 2025-00131

Question No. 6

Responding Witness: Shannon L Montgomery / Peter W. Waldrab

Q-6. State how the tests will be recorded, how long the records for each test will be kept, and if the records will be maintained in a manner that can be inspected by utility customers and the Commission or its staff.

A-6. The AMI meter test records would be recorded within the Companies' meter asset management system, retained per the requirements of 807 KAR 5:006, Section 18, and are available for inspection upon request.

LOUISVILLE GAS AND ELECTRIC COMPANY
AND
KENTUCKY UTILITIES COMPANY

Response to Commission Staff's First Request for Information
Dated June 9, 2025

Case No. 2025-00131

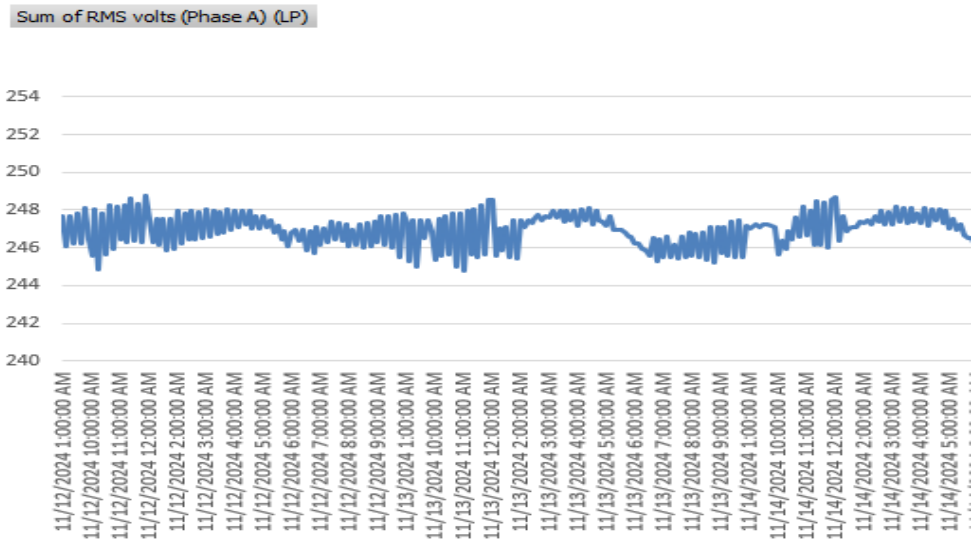
Question No. 7

Responding Witness: Shannon L. Montgomery / Peter W. Waldrab

Q-7. Provide an example of what the AMI voltage surveys and recordings look like as recorded by the AMI system, as well as an example of the current voltage surveys and recorders installed at various locations on your system.

A-7. Sample of AMI voltage survey:

Graph:

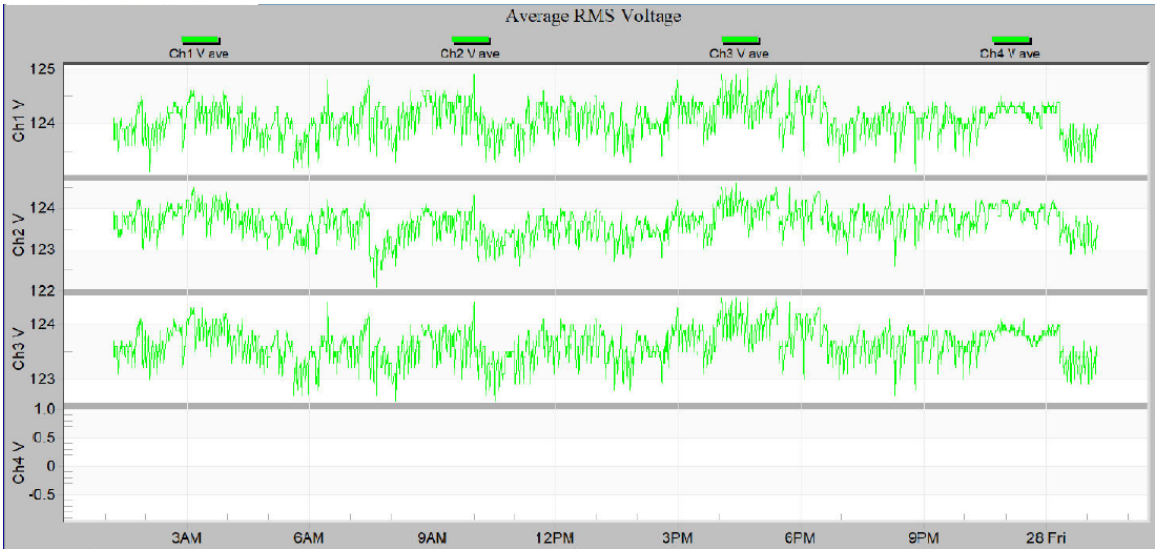


Voltage:

Info	Interval D	Gap(*)	+kVARh	Reactive kVARh	-kVARh	Reactive kVARh	volts (Phase A)	volts (Phase C)	Interval	Status	UTC Offset
Published	11/12/2024 12:00:00 A		0.0636	0.0132	0	0	247.54	0	15 Minute	OK	-300
Published	11/12/2024 12:15:00 A		0.0648	0.0126	0	0	247.54	0	15 Minute	OK	-300
Published	11/12/2024 12:30:00 A		0.0870	0.0120	0	0	247.54	0	15 Minute	OK	-300
Published	11/12/2024 12:45:00 A		0.0864	0.0120	0	0	247.54	0	15 Minute	OK	-300
Published	11/12/2024 1:00:00 AM		0.0762	0.0120	0	0	247.68	0	15 Minute	OK	-300
Published	11/12/2024 1:15:00 AM		0.0624	0.0126	0	0	247.68	0	15 Minute	OK	-300
Published	11/12/2024 1:30:00 AM		0.0618	0.0126	0	0	247.82	0	15 Minute	OK	-300
Published	11/12/2024 1:45:00 AM		0.0738	0.0084	0	0.0024	248.11	0	15 Minute	OK	-300
Published	11/12/2024 2:00:00 AM		0.1014	0	0	0.0066	247.96	0	15 Minute	OK	-300
Published	11/12/2024 2:15:00 AM		0.0972	0	0	0.0066	247.82	0	15 Minute	OK	-300
Published	11/12/2024 2:30:00 AM		0.0768	0	0	0.0060	247.96	0	15 Minute	OK	-300
Published	11/12/2024 2:45:00 AM		0.0750	0	0	0.0066	247.89	0	15 Minute	OK	-300
Published	11/12/2024 3:00:00 AM		0.0678	0.0066	0	0.0024	248.04	0	15 Minute	OK	-300
Published	11/12/2024 3:15:00 AM		0.0822	0.0126	0	0	247.96	0	15 Minute	OK	-300
Published	11/12/2024 3:30:00 AM		0.0858	0.0120	0	0	247.89	0	15 Minute	OK	-300
Published	11/12/2024 3:45:00 AM		0.0708	0.0120	0	0	248.04	0	15 Minute	OK	-300
Published	11/12/2024 4:00:00 AM		0.0624	0.0126	0	0	247.96	0	15 Minute	OK	-300
Published	11/12/2024 4:15:00 AM		0.0624	0.0126	0	0	247.96	0	15 Minute	OK	-300
Published	11/12/2024 4:30:00 AM		0.0516	0.0114	0	0	247.96	0	15 Minute	OK	-300
Published	11/12/2024 4:45:00 AM		0.0882	0.0096	0	0.0006	247.68	0	15 Minute	OK	-300

Sample of current voltage survey: (surveys may differ depending on type/brand of recording device used)

Graph:



Voltage:

		Voltage											
		Ch 1			Ch 2			Ch 3			Ch 4		
Date	Time	min	ave	max	min	ave	max	min	ave	max	min	ave	max
02/26/2025	15:36:00	123.1	123.5	123.8	122.5	122.9	123.2	122.5	123.0	123.3	0.1	0.1	1.2
02/26/2025	15:36:30	123.3	123.7	124.0	122.7	123.1	123.4	122.7	123.2	123.4	0.1	0.1	0.2
02/26/2025	15:37:00	123.2	123.7	124.0	122.7	123.1	123.3	122.6	123.1	123.4	0.1	0.1	1.0
02/26/2025	15:37:30	123.3	123.7	124.0	122.7	123.1	123.4	122.7	123.2	123.4	0.1	0.1	0.6
02/26/2025	15:38:00	123.2	123.8	124.1	122.7	123.2	123.4	122.6	123.2	123.6	0.1	0.1	0.1
02/26/2025	15:38:30	123.4	123.8	124.1	122.9	123.2	123.5	122.8	123.3	123.6	0.1	0.1	0.3
02/26/2025	15:39:00	123.4	123.9	124.2	122.9	123.3	123.6	122.7	123.3	123.6	0.1	0.1	1.1
02/26/2025	15:39:30	123.5	123.9	124.2	122.9	123.3	123.6	122.9	123.3	123.7	0.1	0.1	1.0
02/26/2025	15:40:00	123.5	124.0	124.4	122.9	123.4	123.8	122.8	123.4	123.9	0.1	0.1	0.6
02/26/2025	15:40:30	123.0	123.5	123.9	122.5	122.9	123.3	122.4	123.0	123.4	0.1	0.1	0.8
02/26/2025	15:41:00	122.9	123.4	123.8	122.4	122.8	123.1	122.3	122.9	123.2	0.1	0.1	0.4
02/26/2025	15:41:30	123.2	123.6	124.0	122.7	123.0	123.4	122.7	123.1	123.5	0.1	0.1	0.1
02/26/2025	15:42:00	123.2	123.6	123.9	122.6	123.0	123.4	122.5	123.0	123.4	0.1	0.1	0.1
02/26/2025	15:42:30	123.1	123.7	124.1	122.6	123.1	123.5	122.5	123.1	123.6	0.1	0.1	0.1
02/26/2025	15:43:00	123.4	123.8	124.2	123.0	123.3	123.6	122.8	123.3	123.6	0.1	0.1	0.1
02/26/2025	15:43:30	123.5	123.9	124.2	123.0	123.4	123.8	122.9	123.3	123.8	0.1	0.1	1.0
02/26/2025	15:44:00	123.6	124.0	124.3	123.3	123.7	124.0	123.2	123.6	123.9	0.1	0.1	0.3

LOUISVILLE GAS AND ELECTRIC COMPANY
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KENTUCKY UTILITIES COMPANY

Response to Commission Staff's First Request for Information
Dated June 9, 2025

Case No. 2025-00131

Question No. 8

Responding Witness: Peter W. Waldrab

Q-8. State if the AMI voltage recording hardware and software have the ability to take continues readings, or if readings will be taken at set intervals.

A-8. The AMI meters deployed by the Companies are continuously recording voltage and record the average voltage at 15-minute intervals. The recorded voltage reading is an average over that 15-minute interval. Designated "bellwether" meters used for voltage optimization record voltage every 5 minutes and those records are also retained for 5 years.

LOUISVILLE GAS AND ELECTRIC COMPANY
AND
KENTUCKY UTILITIES COMPANY

Response to Commission Staff's First Request for Information
Dated June 9, 2025

Case No. 2025-00131

Question No. 9

Responding Witness: Peter W. Waldrab

Q-9. State whether the AMI system and/or software have the ability to detect exceptions that are out of limits, like voltage limits.

A-9. Yes. The AMI system deployed by the Companies is configured to retrieve and store voltage sag and voltage swell events detected by the AMI meters.

LOUISVILLE GAS AND ELECTRIC COMPANY
AND
KENTUCKY UTILITIES COMPANY

Response to Commission Staff's First Request for Information
Dated June 9, 2025

Case No. 2025-00131

Question No. 10

Responding Witness: Peter W. Waldrab

Q-10. State whether the AMI system monitors and/or records other exceptions other than voltage.

A-10. Yes. The AMI system deployed by the Companies is configured to record and retrieve other exceptions or events detected by the AMI meter. Those include, but are not limited to, loss of phase, momentary outages, tamper attempts, high temperature alerts, service wiring diagnostics, and meter configuration specific alerts.

LOUISVILLE GAS AND ELECTRIC COMPANY
AND
KENTUCKY UTILITIES COMPANY

Response to Commission Staff's First Request for Information
Dated June 9, 2025

Case No. 2025-00131

Question No. 11

Responding Witness: Peter W. Waldrab

Q-11. State whether the electric utility would benefit from a deviation of the requirement in 807 KAR 5:041, Section 7, and if so, in what way.

A-11. Yes. The Companies currently comply with this regulation by maintaining 160 recording voltmeters that are utilized at representative points in the system. The annual cost to perform these voltage surveys is estimated to be $100,000. The AMI meters deployed by the Companies are capable of capturing and transmitting voltage data that satisfies the surveying requirements of the regulation. In essence, the voltmeters required by 807 KAR 5:041, Section 7 are redundant of AMI and add labor and equipment costs.

LOUISVILLE GAS AND ELECTRIC COMPANY
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KENTUCKY UTILITIES COMPANY

Response to Commission Staff's First Request for Information
Dated June 9, 2025

Case No. 2025-00131

Question No. 12

Responding Witness: Peter W. Waldrab

Q-12. State whether the electric utility will have the ability to satisfy the Commission of its compliance with voltage requirements if a deviation from 807 KAR 5:041, Section 7 is granted, and if so, state how.

A-12. Yes, the Companies will have the ability to satisfy the voltage survey requirements of 807 KAR 5:041, Section 7 if a deviation is granted. The AMI meters deployed by the Companies have sufficient accuracy to perform these voltage surveys at far greater density than the representative sampling of portable voltmeters. The data from these meters is being retained for 5 years and is available for inspection upon request.

LOUISVILLE GAS AND ELECTRIC COMPANY
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KENTUCKY UTILITIES COMPANY

Response to Commission Staff's First Request for Information
Dated June 9, 2025

Case No. 2025-00131

Question No. 13

Responding Witness: Peter W. Waldrab

Q-13. If a deviation to the requirements of 807 KAR 5:041, Section 7 is granted, state whether the electric utility will still be able to retain all records of the voltage records and surveys taken with in the last three calendar years and allow inspection by the utility's customers and the Public Service Commission.

A-13. Yes. The data obtained will be retained for at least three calendar years and is available for inspection upon request.